FORENSIS

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Forensis
The Architecture of Public Truth

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9 Introduction: Forensis – Eyal Weizman

Truth

35 Getting the dead to tell me what happened – Thomas Keenan
56 Can the Sun Lie? – Susan Schuppli
65 Aural Contract – Lawrence Abu Hamdan
83 Case Bil'in – Forensic Architecture and SITU Research
97 Legal Ruptures: A conversation with Michael Sfard
109 Before and After – Ines Weizman and Eyal Weizman
125 Mayhem in Mahwah – Gerald Nestler

Ruins

149 The Architecture of Negation:
An interview with Robert Jan van Pelt
157 What the War Will Look Like – Helene Kazan
166 Forensic Theater – Shela Sheikh
189 Case Living Death Camps – Forensic Architecture and Grupa Spomenik
235 Proportionality Complex – Srdjan Jovanovic Weiss
242 Chechnya Album – Jonathan Littell
254 Breathing Space – Füsun Türetken
264 Ruins under Construction – Gabriel Cuéllar

Assemblies

279 Entering Evidence – Susan Schuppli
317 The Architecture of International Justice:
Francesco Sebregondi in conversation with Cesare P. R. Romano
326 Resolution 978HD – Model Court
335 Case White Phosphorus – Forensic Architecture in collaboration
with SITU Research
349 Lawless Lines – DAAR with Nicola Perugini

Secrets

361 Introduction, Part II: Matter against Memory – Eyal Weizman
381 Uneasy Listening – Susan Schuppli
393 A Secret in Plain Sight – Chris Woods
400 Persistent Exception – Jacob Burns
409 Case Drone Strikes – Forensic Architecture in collaboration with SITU Research
471 Panorama of Destruction – Emily Dische-Becker and Hisham Ashkar

Ecologies

483 The Forensic Scenography – Anselm Franke
495 Floating Bodies – Adrian Lahoud
519 Case Guatemala – Forensic Architecture in collaboration with SITU Research
553 Nonhuman Rights – Paulo Tavares
573 Down to Earth – John Palmesino and Ann-Sofi Rönnskog / Territorial Agency
580 Transparent Earth – Ryan Bishop
591 Geoforensics – Godofredo Pereira
604 Ehrlich's *Pharmakon* – Howard Caygill
614 The Toxic House – Nabil Ahmed

Drift

637 Case "Left-to-Die Boat" – Charles Heller, Lorenzo Pezzani, and SITU Research
657 Liquid Traces – Charles Heller and Lorenzo Pezzani
685 The Two Lives of the *Cap Anamur* – Lorenzo Pezzani
693 Fractured Chains of Custody – Charles Heller
700 The Coming Storm – Modelling Kivalina
712 Black Atlantis: Three Songs – S. Ayesha Hameed
720 Extraterritorial Images – Maayan Amir

743 Lexicon
755 Contributors

Introduction: Forensis

Eyal Weizman

Forensis is Latin for "pertaining to the forum" and is the origin of the term forensics. The Roman forum to which forensics pertained was a multidimensional space of politics, law, and economy, but the word has since undergone a strong linguistic drift: the forum gradually came to refer exclusively to the court of law, and forensics to the use of medicine and science within it.[1] This telescoping of the term meant that a critical dimension of the practice of forensics was lost in the process of its modernization—namely its potential as a political practice.

This book returns to forensis in order to reorient the practice of contemporary forensics and expand it. The aim here is to bring new material and aesthetic sensibilities to bear upon the legal and political implications of state violence, armed conflict, and climate change. But rather than being limited to presentation in the legal domain alone, forensis seeks to perform across a multiplicity of forums, political and juridical, institutional and informal.

Forensis is here employed as the operative concept of a critical practice, one that is committed to investigating the actions of states and corporations and also to critical reflection on the terms by which contemporary forensic investigations—on the scales of bodies, buildings, territories, and their digital representation—are currently undertaken. This book therefore presents both the forensic investigations undertaken by its different authors and a set of critical examinations of the prevalent status of forensics in articulating contemporary notions of public truth.

In relation to the latter, forensis is used to interrogate the relation between the two constitutive sites of forensics—namely *fields* and *forums*. In forensic terms the division is straightforward: the *field* is the site of investigation and the *forum* is the place where the results of an investigation are presented and contested. However, both these sites must be understood to be more than mere locational designations. The field is not only a neutral, abstract grid on which traces of a crime can be plotted out, but itself a dynamic and elastic territory, a *force field* that is shaped by but also shapes conflict. The forum, in turn, is a composite apparatus. It is constituted as a shifting triangulation between three elements: a contested *object or site*, an *interpreter* tasked with translating "the language of things," and the assembly of a public gathering. Forensis thus establishes a relation between the animation of material objects and the gathering of political collectives.[2]

This relation resembles what the Roman rhetorician Quintilian called *prosopopoeia*—the mediated speech of inanimate objects.[3] Small things such as commodities, coins, statues, or weapons could be physically handled,

presented and traded in the forum. Sometimes—as in the story of the bronze statue of the athlete Theagenes of Thasos that fell and crushed a man who scorned it—objects could even be tried, convicted, and sentenced (the statue in this case was put on trial for murder, convicted, and punished by being cast into the sea).[4] Things too far away, too abstract, or too large—such as cities, resources, rivers, territories or states—had to be brought vividly to life by the power of an aural demonstration. They had to be made evident (visible), credible and persuasive. Quintilian called this form of presentation *evidentia in narratione*—a manner of presentation "in which a truth requires not merely to be told, but to a certain extent obtruded."[5] Contemporary modes of *prosopopoeia* animate material objects or landscapes by converting them into data and image.

This complicates the relation between the component parts that make forensic speech. Objects are animated in the process of presentation, referred to as if they were human subjects; as a famous forensic anthropologist once put it, "bones make great witnesses," before going on to pose questions to them in court.[6] The interpreters, meanwhile, are no longer necessarily people or experts but also automated or semi-automated technologies of detection and imaging. Finally, forums are no longer confined to arena-like buildings, but become increasingly diffused across a wide spectrum of sites and media forms.

This book is an interrogation of what could be understood as the "forensic turn"—an emergent sensibility attuned to material investigation that has become increasingly evident not only in contemporary law and the fields of human and environmental science, but also in popular entertainment.[7] Within the context of our forensic present, state agents are shown to detect and uncover, sometimes preempt, the actions of rogue individuals that threaten the social order, thus reasserting the power of a "benevolent state."[8] The state controls the technological means, and science stands as the embodiment of a rational order assembled to confront and overpower irrational aberrations. The present forensic sensibility seeks to bypass human testimony, especially that of the victims of violence, precisely because the memory of violent events, often complicated by trauma, is seen to be marked by the very irrationality, sometimes madness, of the perpetrator, and thus, to a certain extent, to mirror it.

Forensics can however never really overcome the complexities of the subject, the ambiguity of language, and the frailty of witness memory. Material science is never conclusive, but subjected to probability calculations and margins of error, and the material reality forensically presented is itself of course filtered through language. Furthermore, as I shall later explain, while police forensics is a disciplinary project that affirms the power of states, the direction of the forensic gaze could also be inverted, and used instead to detect and interrupt state violations. It is precisely because of the potential political agencies and the complexity of the emerging scientific-aesthetic-linguistic field of forensics that a *new forensis* must emerge to challenge the assumptions of received forensic practices.

*

This book was assembled as a methodological experiment moving along two trajectories. On the one hand it was produced in the context of a "forensic agency" established at the Centre for Research Architecture at Goldsmiths in 2011 under the name of Forensic Architecture. This agency was unique in that its members—architects, artists, filmmakers, and theorists—the ferociously creative fellows, students, and members of the Centre, rather than qualified scientists and pathologists, were those undertaking the investigations. We set our research agenda and chose each of the investigations according to our political interests and commitments, and in order to interrogate the ways in which new types of evidence can affect political and legal processes. Together with different partner organizations,[9] we investigated the actions of states and corporations and offered our analyses to civil society organizations, NGOs, activist groups, and prosecutors, who have presented them in various legal and political forums.

On the other hand our work emerged as a body of historical, theoretical and artistic research into contemporary forensic practices, in order to critically evaluate their epistemologies, assumptions, protocols, and politics of knowledge production.

These component parts of our work were interdependent, but also came into tension with each other, sometimes even into contradiction (how could a responsible "expert" critique the concept of truth?). But rather than seeing the tension between practice and critique as a problem that needs to be resolved by choosing one or the other, we found in this problematization a productive resource that intensified our research process. This tension was essential also because of the fundamental political ambiguity we felt towards existing forensic practices. The modern history of forensics is of course the history of the techniques by which states police individuals. It includes the physiognomic techniques of the nineteenth century and the digital eavesdropping of yesterday. We were on the other hand committed to the possibilities of reversing the forensic gaze, to ways of turning forensics into a counter-hegemonic practice able to invert the relation between individuals and states, to challenge and resist state and corporate violence and the tyranny of their truth. Transformative politics must begin with material issues, just as the revolutionary vortex slowly gathered pace around the maggots in the rotten meat on board the Potemkin.

Our investigations took place mainly in zones outside the effective control of states. These "frontier zones" are the lawless battlefields of our colonial present. They are zones outside established state jurisdiction and established frames of criminal justice, where sovereign jurisdiction is unclear (such as in the Mediterranean Sea, where migrants are left to die), disintegrated (as in some parts of Somalia or Yemen, where militants headquarter and drone assassinations take place), or suspended and under siege (for example in such places as the tribal areas of west Pakistan, Gaza, or the West Bank). In these places, powerful states can both inflict violence and deny they have done so. We have also studied cases of "environmental violence"

along the mineral frontiers of the Amazon basin and the Atacama Desert and undertaken research in the remote highland frontiers of Guatemala, where the state is now coming to terms with the systematic destruction of people and landscapes that took place there a few decades ago. Ordinary criminal forensics can usually not engage with these zones and issues. In contrast to the situation within state borders, here established forums do not always exist. In fact new forums must often be gathered around the necessities of justice.

However, mixed or absent jurisdictions in frontier zones have not limited the dissemination of evidence. New visibilities have emerged with the development and widespread accessibility of digital data derived from activist imagery and their accelerated dissemination via mobile phone, cloud, and social networks. These technologies have expanded the capacity to bear witness, but they have also transformed the meaning of testimony, and to a certain extent eroded its sanctity.[10] Today there are many photographers and spectators but only a few witnesses in the traditional sense. While the number of images and available information in the public domain has been amplified, bringing new sights, sounds, and issues into the eyes and ears of an extended polity,[11] these images also call for new practices of trawling through, looking at, and looking again, interpreting, verifying, decoding and amplifying messages and broadcasting them further.

Forensis should thus be understood as something akin to a "critical forensic practice" that includes both the production of evidence and the querying of the practices of evidence making. Indeed, acts of political and legal activism must negotiate a complicated terrain between compromise, complicity, resistance, and evasion. As the interview with human rights lawyer Michael Sfard in this book demonstrates, confronting political injustice in the name of the existing laws of war (also known as International Humanitarian Law, or IHL) needs to be cognizant of the ways by which these laws have also been increasingly used to regulate, legitimate, and conduct the very violence they seemingly oppose. But the emergence of "a forensic warfare" with which states use the laws of war to inflict violence,[12] providing selective evidence while destroying and denying evidence of their own wrongdoing, has also made Western states increasingly vulnerable to legal action. Western militaries and states now organize to defend against what they refer to as "lawfare," describing it as a core threat on a par with their worst enemies. (Those completely dismissive of the effectiveness of legal action should note how Israel went so far as to call international humanitarian and legal action against it a "third strategic threat" alongside Hezbollah and nuclear Iran.)[13] Sfard spoke to us about his struggles to find ways to work critically and tactically with the law, of his attempts to find modes of practice mindful of its limitations and limited potentials, while simultaneously recognizing the necessity to find other forums in which legal claims could politically resonate.

Artists have collaborated with human rights organizations since the birth of the human rights movement in the mid-1970s, and these two groups have coevolved ever since. Human rights groups made great use of the affective power of poetry, documentary photography, and filmmaking in stirring public compassion and action. On the other hand, the emergence of the human rights sensibility structured the way artists understood and described conflict worldwide, providing means to interrogate historical and political processes from the point of view of its individual victims. Registering this entangled development, the lobbies of human rights organizations are almost exclusively dedicated to art exhibitions depicting personal stories filtered through different documentary practices. However, with several important exceptions, artists' accounts and representations of individuals in distress were external to and illustrative of the actual investigative work of human rights researchers. This project seeks to mark a possible departure from the terms of this collaboration, and employ aesthetic means as investigative tools or as modes of investigation for analyzing political processes and their consequences.

The prospect of political activism committed to technological and scientific investigation might understandably raise objections against the prospect of a return to the "rule" or "tyranny" of experts and to the dangers of becoming detached from direct experience and empathy. But in the field that Thomas Keenan, following Allan Sekula, has called "counter-forensics,"[14] the experts and scientists we have collaborated with did not fit the mold of the authoritarian, objective, and neutral scientist inherited from Victorian-era state-funded science.[15] The majority worked rather in modest, fragile, overstretched, and underfunded organizations, or else carried out their research completely independently and voluntarily. Their work was mostly driven by political commitments and was motivated by a sense of solidarity. Indeed, the significance of the neutrality of the expert in assessing the plausibility of the expertise is waning. Having an axe to grind should sharpen the quality of one's data rather than blunt one's argument. Forensis is a good model for connecting aesthetic practices, activism, and science because it is structured by the necessity of taking sides in an argument, of fighting for and defending claims. (It is when the investigative process is opaque to nonexperts—such as with DNA analysis—that claims for neutrality and objectivity start occupying their traditional central roles.)

In forensis, then, we found both an operative concept and a critical practice, but on the understanding that "critical" also connotes the vital, the crucial, and the decisive. We were not simply content with unveiling and analyzing instances of power camouflaged as benevolence, nor with undertaking a critical anthropology of science or the law. The kernel of our multidisciplinary field was rather architecture, and in architecture we found a mode of intervention.

Indeed, the intensification of architectural research was central to our project. We employed architecture as a field of knowledge and as a mode of interpretation, one concerned not only with buildings but rather with an ever-changing set of relations between people and things, mediated by spaces and structures across multiple scales: from the human body to human-induced

climate change, from the scale of a single home, through that of larger territories, to the scale of the earth as the ultimate home—and one that we gradually came to realize is becoming both a construction site and a ruin.[16] To progress this claim I must explain what we mean by "forensic architecture" and why it became a crucial term for our work.

Forensic Architecture

Considering the wide range of projects, scales, issues, and epistemic frames that the project ended up traversing, it is important to mention that Forensic Architecture had a modest start: it was inspired by the unassuming work of building surveyors—the careful and systemic analysis of the structural and infrastructural conditions of a building.[17]

Building surveyors understand a crucial thing missed by most architects: a building is not a static thing. Rather, its form is continuously undergoing transformations and in these transformations it registers external influences. The various material components of a building—steel, plaster, concrete, or wood—move at different speeds in response to the constant force of gravity, the influence of the climate, changing patterns of inhabitation and use, and the unique force of impact. These diffused form-making forces continue the singular form-making practice of the architect. Surveyors see buildings as matter undergoing complex processes of formation—as matter in formation, that is, as information. It is indeed in the material deformations and structural failures that micro and macro forces, political and historical processes might reveal themselves.

Some of a building's most crucial transformations occur well below the threshold of unenhanced visual perception. It takes years for microscopic air bubbles trapped within a fast-drying paint to make their way up or down the face of a structure; their expansion and contraction, the path taken, and the rate of their crawl respond to year-on-year changes in pressure and temperature, to fluctuations in humidity and changes in the levels of pollution, which are the result of, among other things, political decisions, or more precisely indecisions, regarding the environment. The inefficiencies of the *global climate forum,* for example, are thus indexed in the slight buckling of the wall paint, right under the window sill, in our office's kitchenette. Although, as I will later show, never perfectly so.

For a building surveyor, architecture is a sensor, in that it is *aestheticized* to its environment. Its form of aesthetics is however primer for and primary to human judgment. Aesthetics is originally understood as that which pertains to the senses, but in this context it designates not the human senses but rather the sensorial capacity of matter itself. It is the way in which matter can detect, register, and respond not only to contact and impact, but to influences in its environment and to remote presence. Matter can be regarded as an aesthetic sensorium inasmuch as its mutations register minute transformations, fluctuations, variations, and differences within force fields.

Forensics aestheticizes territorial formations in different ways. The incessantly transforming fields of conflict are the result of relations between a wide multiplicity of agents and the environments in which they are located. I have previously referred to these zones as the *political plastic* (referring to Joseph Beuys's definition of art as a social plastic), in order to emphasize the ways conflicting geopolitical forces continuously interact with the materiality of the surface of the earth as they slow into form, or accelerate in a blast!

Architecture emerges as a documentary form, not because photographs of it circulate in the public domain but rather because it performs variations on the following three things: it *registers* the effect of force fields, it contains or *stores* these forces in material deformations, and, with the help of other mediating technologies and the forum, it *transmits* this information further.

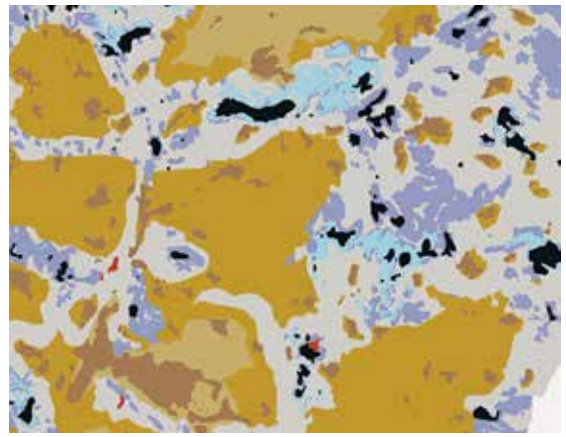


Fig. 1. Eyal Weizman, *Political Plastic: The West Bank*, 2002. These are graphic layers of a map of Jewish settlements in the West Bank prepared jointly by Eyal Weizman and B'Tselem. In blue are Jewish settlements; in brown, Palestinian built fabric. The map was presented as evidence in a number of legal processes in Israel and in The Hague. The form of the colored areas on the map registers changing political forces. Source: http://www.btselem.org/download/settlements_map_eng.pdf.

But the aesthetic dimension of forensics is not simply a return to a pre-Kantian aesthetics in which the sensing object was prioritized over the sensing subject—rather, it involves a combination of the two.[18] Material aesthetics is merely the first layer of a multidimensional concept that Thomas Keenan and I called *forensic aesthetics*.[19] Forensic aesthetics is not only the heightened sensitivity of matter or of the field, but relies on these material findings being brought into a forum. Forensic aesthetics comes to designate the techniques and technologies by which things are interpreted, presented, and mediated in the forum, that is, the modes and processes by which matter becomes a political agent.

*

Seen from the perspective of forensic architecture, investigating this material geology of contemporary conflict still requires a building surveyor, but a building surveyor of a new kind: the survey can no longer be immediate and haptic; the trained surveyor's eye and the notepads on which his/her observations are recorded are replaced by remote-sensing technologies that augment the aesthetic sensibility of material formations; images of localized forms of damage that *have* occurred are extended by mathematical algorithms to model the damage that *might* occur in the future. But something of the relation between a structural issue, the surveyor and the forum still lingers.

If the figure of the detective was the nineteenth century's response to the density, complexity and alienation of the modern metropolis, the building surveyor must be the indispensible figure for understanding the present condition of urban life as that of urban warfare. This form of violence—eruptive in cases of armed conflict or latent in ceaseless architectural acts of

securitization—comes to reconfigure both the metropolis (the Western city) and the megacity (where Western armies chase their enemies). It manifests itself in the entangled acts of construction, fortification, destruction, and reconstruction. In a time when most people dying in armed conflicts die inside buildings, the city can no longer be considered merely the location of war, but rather should be understood as the apparatus with which warfare is conducted. When the dust of its destruction finally settles, the way it settled can become evidence.[20] But a ruin is rarely a piece evidence in and by itself. Cities are complex systems and the targeting of buildings, bridges, roads, and other nexuses of infrastructure can exercise a relational effect well beyond the site of impact.

For forensic architecture, buildings are thus not just passive elements, receptive sensors on which events are registered. Nor are they just the scenes of a crime, the locations in which violence takes place. Rather, built environments are composite assemblies of structures, spaces, infrastructure, services, and technologies with the capacity to act and interact with their surroundings and shape events around them. They structure and condition rather than simply frame human action, they actively—sometimes violently—shape incidents and events.

A structural crack is a good example of an element that is both a sensor and an agent. Although such cracks may be seen as indicators of a structural problem external to themselves, they should not be understood simply as symptoms, but rather as material events that emerge as a result of evolving force contradictions around and within them. No crack can ever be reproduced; each is a unique combination between micro material inconsistencies and macro force fields. Cracks progress along paths of least resistance that tear through the places where the cohesive forces of aggregate matter are at their weakest. Moving up through the deep surface of the earth, supersonic cracks tear not only through rock, but also through the thickness of the atmosphere as if it were a solid medium. Cracks are without scale; their paths connect the materiality of otherwise disparate elements, including tectonic plates, bedrocks, structural foundations, and domestic walls. They move through rock where a denser mineral concentration has settled. A column, beam, or floor might crack where the cement hardened around the odd cigarette butt thrown into the mix during the process of construction.

As non-matter, cracks move faster than the material formations they tear through. A famous Guatemalan forensic anthropologist, holding a skull in his hand, explained to Paulo Tavares and I that when a gunshot hits a skull at three times the speed of sound, cracks emerge around the entry hole. As the cracks start tearing round the circular circumference of the skull, the speed of their movement is the same as the speed of the bullet, but they accelerate because the internal pressure adds to the force of impact. These cracks move so much faster than the bullet (which as a material thing is decelerating under the influence of friction) that they beat it to the far side; thus the bullet impacts an already cracked surface on the other side of the same skull.[21]



Fig. 2. Forensic anthropologist Fredy Peccerelli demonstrates the impact on a skull of a bullet fired from a gun. Still from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.

When architectural surveyors study cracks or other aspects in the structural pathology of a building, they tend to interpret their findings in relation to a narrowly circumscribed set of conditions. They trace material deformations back to force, but in this they have reached the limit of their epistemic frame. Forces are rarely linked back to their multiple political causalities. Such was the case in the trials concerning the responsibility for the collapse of the Rana Plaza factory in Savar near Dhaka. On April 23, 2013, a crack appeared in the floors and walls of the building used by garment industry sweatshops. Municipal building inspectors ordered the closure of the factory. But a crack is merely the potential for something to occur. Whether it will tear a building apart or just linger there for years is a matter of probability. The Rana Plaza factory owners, hard pressed to deliver cheap fashion products to Western labels, assessed the risk of collapse and the potential deaths of their workers in relation to the risk of losing a lucrative contract due to delays in production. They disregarded the warnings and forced the workers to return on the following day (the senior management was not based in the building). The workers, without voice or choice, entered the building at 8 a.m.; at 9 a.m. the crack expanded, cutting furiously through it. More than a thousand people—mostly women earning less than $40 a month to produce our clothes—died in the rubble.

The legal process dealing with the collapse of the building—our research fellow Nabil Ahmed reported back from Bangladesh—involved building surveyors both as witnesses and among the accused. The trial had the authority to engage with the responsibility for the causes of the event only in terms of the construction quality of the building, the thickness of reinforcing bars in the concrete columns, the floors illegally added, and the loads of the industrial machinery that the building was never designed to hold. Left out of the analytical process were the larger forces and actors involved in the collapse: factory owners connected to the ruling party, the consumers, and the multinational corporations feeding an endless appetite for cheap fashion, forcing prices down and productivity up through a tangle of subcontracting chains, all of which had the combined effect of both enriching the elite and distancing their actions from direct responsibility.

An analysis that would expand outwards from the crack should not only seek closure and reparation, but should articulate new claims for justice. Dhaka-based architect and political activist Sujaul Khan made this connection when he concluded his detailed survey of the collapse by extending the metaphor to politics, writing





Figs. 3, 4. Stills from a Dhaka police video showing building surveyors' markings over the crack (image on the left) in one of Rana Plaza's walls, Savar, Dhaka area, April 23, 2013 (a day before the collapse). Source: "Dhaka Building Collapse: Police footage shows cracks," BBC News, April 26, 2013 http://www.bbc.co.uk/news/world-asia-22307589.

that "the entire industry is bursting at its seams with dissent," and insisted that justice necessitates a combined approach dealing with both the material conditions of the building and those of the workers.[22] This recalls the figure of Leonard Horner—the nineteenth-century factory inspector for Lancashire (and an amateur geologist) who, by exposing poor working conditions in the garment industries (how little has changed!), according to Karl Marx, "rendered an undying service to the English working class […] that should never be forgotten."[23]

In another part of the world Israeli excavations undertaken in the name of "biblical archaeology" beneath the Palestinian neighborhood of Silwan, next to the old city in occupied Jerusalem, displaced a level of earth between building foundations and the limestone bedrock. The vibrations caused by the excavation work could no longer be absorbed by the layer of aggregate earth. These vibrations shot to the surface uninterrupted. In their petition to the Israeli High Court in 2008—as Dana Behrman, a former student at the Centre for Research Architecture, has written—Palestinian residents and their representatives seeking to stop work on the site presented photographs of fractures in roads and water and sewage systems, crawling up structural foundations and domestic walls, disappearing and reappearing as they discover ever more lines of least resistance through the surface or depth of natural limestone bedrock, asphalt, concrete, and plaster.[24] Excavating for archaeological ruins below the surface seems to have turned buildings above the surface into contemporary ruins. The cracks also moved across different epistemic/disciplinary frames: geology, archaeology, urbanism, and architecture. Echoes of the historical and political context that involves the ongoing underground occupation of Palestine were uttered in court but never heard. After a short suspension, the court rejected the petition of the residents, accepted the state's claim that the cracks might have been the result of "poor and illegal construction," and authorized the continuation of the subterranean colonization of Palestine.

*

Our task is to extend the scope of forensic architecture beyond the presentation of structural analysis in the context of property and insurance disputes, and turn it into an analytical frame and a multilayered political practice. It should make use of what Arjun Appadurai, following Marx and Benjamin, has called "methodological fetishism"—the microphysical analysis in which the part or detail becomes an entrypoint from which to reconstruct larger processes, events and social relations, conjunctions of actors and practices, structures, and technologies.[25] Beyond its manifestation in commodity or sexual form, it is in forensics that the fetish can be most productively practiced today. Here, the fetish should not be the mystifying and obfuscating veil that masks the true way in which objects are made in the world—a feature of capitalism that Marx identified in commodity fetishism. On the contrary, under the microphysical lens of methodological fetishism, it is in the object that the fabric of complex social relations, imprinted political forces, and logics of practice are folded.[26] If fetishism is the attribution of an inherent power and a certain agency to inanimate objects, then we must embrace the term as we come to understand objects, buildings, cracks, and their representations as historical agents.



Figs. 5, 6. Cracks in the road and on the walls in the Palestinian neighborhood (former village) of Silwan, east Jerusalem. These images were submitted to the Israeli court in 2008. Source: www.silwanic.net/?p=1552.



Fig. 7. (right) Human Rights Watch's munitions expert Marc Garlasco presenting a photograph that he took in the aftermath of the 2008–2009 Gaza attack (Cast Lead) at the Human Rights Project, Bard College, in April 2010. In the image a woman stands admirably steadfast in front of the ruins of her house. This photograph demonstrates the shift in emphasis from victim testimony to forensic architecture, and its problems. In narrating this image Garlasco shifts his attention from figure to ground, interrogating the rubble of the house behind the witness while masking her completely. His findings were frequently quoted in the Goldstone report. Photo: Human Rights Project, Bard College, 2010.



Fig. 8. (below) Richard Goldstone's press conference in Gaza, June 4, 2009. This image is perhaps one of the best demonstrations of the principles and potential problems of forensic architecture. Goldstone, heading a UN commission of inquiry into the Israeli attack of Cast Lead (2008–2009) stands in front of a destroyed multistoried building. Goldstone was worried that the credibility of the witnesses in Gaza would be politically questioned and turned the attention of his report to material things. Buildings here stood for the absence of witnesses. Around Goldstone are members of the government in Gaza; before them stands a bouquet of microphones belonging to international news networks. But since the ruined building cannot speak for itself, Goldstone speaks on its behalf to an international forum. Photo © Ali Ali/EPA/Corbis.

From the perspective of forensics, architecture is an analytic and probative mode for inquiring into the present through its spatial materialization. Forensics turns space into evidence, but also into the medium in which different types of evidence come together and into relation with each other. Forensic architecture thus intensifies the investigative capacity of architecture and turns it into a mode of public address, a way of articulating political claims, and forces architectural researchers to face cross-examination in the most antagonistic of forums.

On the other hand, seen from the point of view of architecture, forensics is extracted from its purely juridical context and placed in the political context of the forum. Producing and presenting new types of evidence, as some essays in this book will argue, can challenge the very forums in

In some respects forensic architecture is similar to, and in others it crucially departs from, the modes of practice found in other forensic practices like forensic medicine, anthropology, or archaeology. This departure is not due to the fact that the subject matter of the former's investigation is qualitatively different—architecture could indeed describe the pathology of the contemporary era; buildings, cities, infrastructure, and territories (as well as their ruination) could potentially occupy an analogous place to that of the human body in forensic medicine, for example. Rather, it is because the *architecture* in forensic architecture poses a different kind of challenge to the *forensic* in this pairing, and vice versa. They mutually undo some of their respective authorities and designate a field that is beyond the scope of what is otherwise bounded by the separate epistemic frames they bring together.

which evidence is presented. Evidence can affect a change to the protocols in forums, or expand their perceptual and conceptual frames. New forums may emerge when a new claim becomes evident. Here forensic architecture becomes a projective practice that designates modes of conceiving, assembling and constructing forums for the future.

The stereoscopy of forensic architecture thus simultaneously looks backwards and forwards. In order to interpret past events from the analysis of material spaces, it is necessary to assemble new forums able to respond to the complex demands of the future. To put it another way, forensic architecture engages, both in acts of claim making and in the practice of forum building.



Figs. 9–12. In the spring of 2009, following the Israeli winter attack, the Gaza-based and Hamas-run Ministry of Public Works and Housing started compiling an archive titled "A Verification of Building-Destruction Resulting from Attacks by the Israeli Occupation." This "book of destruction" contained thousands of entries, each documenting a single building that was completely or partially destroyed, from cracked walls in houses that still stand, to those completely reduced to piles of rubble. Each photograph displayed a catalogue number spray-painted onto the walls or onto the rubble itself. Sometimes, the building had been so badly pulverized that the numbers had to be held up in front of the camera at the moment the photograph was taken. Source: Palestinian National Authority, Ministry of Public Works and Housing.

Forums

Forensic architecture's practice of establishing forums around evidence (rather than the more common procedure whereby evidence enters existing courts) has an important historical precedent. The ICTY (International Criminal Tribunal for the former Yugoslavia) was established by the UN in 1993 soon after the beginning of the Bosnian war and the discovery of evidence of extreme violence there.[27] Its establishment was seen as a way of intervening in the then still ongoing conflict.[28] But it was established precisely in order *not* to intervene in the conflict. The decision of Western states to set up the ICTY, along with their strategy of sending and supporting humanitarian missions, can be seen as an intentional alternative to sending their militaries into action.

Francesco Sebregondi's conversation with Cesare Romano in this book demonstrates the way in which the ICTY played a central part in shaping an informal network of institutions that also includes international, national, and provincial courts, human rights councils and parliamentary commissions. Although these tribunals are some of the most institutionalized sites for the presentation of architectural evidence, the physical architecture of their settings can often be unassuming. Some of them inhabit improvised or rented offices, community and sports halls, which demonstrates the extent to which their physical setting is secondary to their function as media environments. The "agora-centrism" of these international tribunals means that they have emerged as media spaces in a way that traditional courts—still largely allergic to the presence of the media—are not yet allowed to be. The architecture and physical arrangement of tribunals, as Laura Kurgan explains, responds to the media by which they operate. Face-to-face interaction is replaced by face-to-screen and screen-to-screen interrogation. The legal process proceeds much like the work of broadcast studios, using a comparable array of facilities to record, store, archive, and transmit the images and sounds on which it depends.[29]

In her project on the ICTY archive, Susan Schuppli examines the procedures by which media artifacts turn into evidence. As she follows the movement of video tapes, satellite images, maps, and recording devices through a juridical matrix that sorts, archives, catalogues, and presents them, these objects become what she calls "material witnesses": that is, they bear witness not only to the alleged criminal events but to the very sorting process they underwent in order to qualify as evidence. Sharing this preoccupation, the Model Court collective is concerned with the ways in which new audio-visual and telecommunication technologies, their material presence, digital properties, interruptions, and breakdowns, outline the contemporary sphere of universal jurisdiction as that of spatial and linguistic dislocation. Their film and installation *Resolution 978HD* (2013), reproduced in this book as an image essay, follows the genocide trial of François Bazaramba, a Rwandan national, in a district court of Porvoo, Finland. Because the trial necessitated the remote interrogation of the accused via teleconference, the legal principle of *habeas corpus*—which usually demands the physical presence of the accused—was reinterpreted as the threshold condition of various technologies—bandwidth, resolution, and automatic light detectors—that would allow the remotely assembled court to see a person blush or sweat.

From Subject to Object

Within the fields of human rights and international law a methodological shift has recently lead to a certain blurring. An emerging forensic sensibility has increasingly blurred the previously distinct categories of evidence, corresponding to the law's reference to objects, and the witness, the source of human testimony. This forensic turn is articulated against a cultural background that is increasingly tuned to the testimony of victims. Referred to by scholars as the "era of the witness," recent decades have seen the foregrounding of the narratives of victims, so that they have exerted an enormous cultural, aesthetic, and political influence.[30]

One of the manifestations of this blurring of categories is found in the way attention to the linguistic contents of testimony (*logos*) is increasingly displaced by attention directed to the materiality of the voice (*phōnē*). This is especially apparent in the way human speech is currently interrogated in the context of asylum hearings. Lawrence Abu Hamdan's work is concerned with the way border agencies employ digital techniques of voice enhancement to conjure a simplified geography of origins out of people's accents (most often in order to deny asylum and justify deportation). In his chapter in this volume, he explains that, under these conditions the witness

account becomes itself the object of investigation, rendering the voice simultaneously "the means of testimony and the object of forensic analysis." Such privileging of the bodily aspect of enunciation over the linguistic of course has strong colonial connotations, and threatens to drown out the message, sometimes fragile and faint, in the stories of the most vulnerable people. In seeking the ultimate truth about the subject in the objectified qualities of its body, these techniques resemble physiognomy and phrenology—prominent influences on criminology—which up to the middle of the nineteenth century saw "the spirit in the bone."[31] Modern techniques of policing, it seems, do not just resemble, but in fact inherit aspects of these outmoded and politically suspect practices.

Increased attention to the body has recently been manifest in the mobilization of medical records and other evidence of bodily harm in human rights and humanitarian testimonies. This has challenged more traditional human rights epistemologies. From its inception, human rights work was been concerned with the human subject, the individual, and developed its methodologies around the dissemination of victim testimonies. These testimonies provided human rights organizations not only with an epistemic resource with which to reconstruct histories of violence, but also charged their advocacy with affective ethical and political force.[32]

However, the ultimate witnesses of atrocities, as Primo Levi insisted, are not the survivors whose testimonies can be listened to, recorded, archived, and transmitted.[33] Starting in the mid-1980s and with increasing prominence since, forensic archaeologists, anthropologists, and pathologists have been upturning the surface of the earth. In Argentina, Spain, Guatemala, Poland, Cambodia, Afghanistan, Sudan, Yugoslavia, Rwanda, Honduras, Iraqi Kurdistan, and Cyprus their work has uncovered hidden historical details of extreme acts of violence, and aided in the returning of human remains to victims' families. The contribution made by exhumations in the form of legal evidence has been referred to as "the testimony of the dead."[34]

These efforts made a crucial contribution to shifting the political epistemologies and aesthetic representations of conflicts, inaugurating nothing less than a new cultural sensibility whose implications are still evident in the way political conflicts are represented in the news media, but also in literature, film, the arts, and popular culture. Today, when exhumations are among the most common techniques for dealing with post-conflict environments, we might easily forget that not too long ago the mass graves of the victims of political violence were only the sites of religious or national ceremonies. In many places where conflicts were still ongoing, they were neglected or treated as rubbish dumps.

But it is not only the exhumation of the civilian victims of wars that has made a significant intervention in the politics played out on the surface; the forensic reexamination of the bodies of former anti-imperial or anti-colonial leaders, whose deaths occurred in suspicious circumstances, has recently been embraced as a means of challenging dominant historical and political narratives. In an earlier essay, Godofredo Pereira described how Hugo Chávez's arrangement of the televized exhumation of the bones of Simón Bolívar in 2010 became a hybrid between a national ceremony, a scientific investigation, and a geopolitical intervention. Intended to cement a bond between Chávez and Bolívar, it was however publicly presented as an attempt (ultimately unsuccessful) to determine whether Bolívar's bones contained traces of arsenic, a possibility that would have implicated the Colombian oligarchy of the time, and by extension present-day Colombia, Chávez's bête noire, in the killing of "the liberator."[35] This was just one instance of a frenzy of recent exhumations in South America. A year later, in 2011, the body of Salvador Allende was also exhumed, this time following the request of his family, but with no less political implications. The task of the exhumation, which was more sober, was to ascertain whether his death had been caused by suicide, as officially stated on his death certificate, or by Pinochet's troops when they stormed the presidential palace at the time of the coup. The pathologists that gathered around the remains explained the controversial presence of two bullet holes in the skull, a fact that seemed to support an assassination scenario, as being the result of Allende's use of an automatic rifle—the AK47 presented to him by Fidel Castro. Other recent exhumations include that of Nobel Prize-winning poet and diplomat Pablo Neruda in 2012 for a similar reason to that of Allende, and Francisco Caamaño, the executed guerrilla leader and former president of the Dominican Republic, whose remains were recently exhumed in order to confirm their identity before reburial. A truth commission examining the abuses of Brazil's long dictatorship has recently exhumed João Goulart, the former Brazilian president toppled in a 1964 coup supported by the United States, in order to determine whether he was poisoned in 1976 by agents of Operation Condor while in exile in Argentina.[36]

The recent cycle of exhumations in South America, which began in the aftermath of the junta regimes there, might relate to the cultural tradition of presenting and celebrating the dead. Though this connection between tradition and forensic politics might be specific to Latin America, similar practices are also prevalent on the other side of the Atlantic. In Spain exhumations are currently being undertaken in order to find and identify the remains of the poet Federico García Lorca and others killed during the Spanish Civil War. In Palestine the remains of Yasser Arafat were recently exhumed in a search for a lead isotope that would indicate the presence of radioactive polonium-210 and implicate Israel (and its nuclear reactor) in this death. Forensics, increasingly, it seems, becomes a tool of political protest. The fact that the anti-colonial or the anti-imperial leaders of the past are being exhumed might indicate that the politics they pursued are felt to be direly absent amongst the living.

Human remains provided the hinge on which our forensic sensibility turned. However, as the above cases of exhumations demonstrate, this sensibility did not place science above politics. Nor do such cases, as

Thomas Keenan elaborates in his essay, undo the ambiguity and messiness that is central to the concept of evidence. Although, in the popular imagination, the cold gaze of science produces conclusive and non-contestable proofs, findings in the natural sciences are all subject to probability and margins of error. The qualifying statements with which science expresses its finds has always left room for political manipulations and negations. The Swiss forensic team that examined the remains of Arafat concluded that he was poisoned by Polonium with "83% confidence." This allowed the spokesman for the Israeli foreign ministry to characterize the scientific results as "inconclusive, at best."[37]

The testimonies of survivors were never simply matters of positive truth: it was often in silence, distortion, confusion, or outright error that the effects of trauma, and hence the eventually accepted truth of certain events, was inscribed. Yet the turn to exhumations does not produce a scenario in which the solid object provides a stable and fixed alternative to human uncertainties and ambiguities.[38] On the contrary, the aesthetic, political, and ethical complications that emerge with this turn establish the dead body not as an alternative to testimonial practices, but rather their continuation.



Fig. 13. Labeling and location of the collected specimens taken from Yasser Arafat's body upon his exhumation on November 26, 2012. Source: "Swiss forensic report on Arafat's death," Al Jazeera, last updated November 6, 2013, http://www.aljazeera.com/investigations/killing-arafat/swiss-forensic-report-arafat-death-201311671255163780.html.

The next phase in our investigation into the development of a new forensis was not confined to the study of the shift from subject to object, but rather of the tension that new forensic practices articulated between *figure* and *ground*. The figure–ground gestalt—which in our case describes the relation between the individual (dead or alive) and environments (natural or man-made)—bears on questions of detectability and liability and implies also a shift in the political potential of forensics.

From Object to Field

In their work, Grupa Spomenik (Monument Group) challenges both the objectification and subjectification of human remains. An introduction to their ongoing platform, "Mathemes of Re-association," is presented in this book by Shela Sheikh. In August 1995, the UN Security Council was shown satellite images of what appeared to be mass graves near Srebrenica; a month later, the Serbian forces that perpetrated the genocide exhumed these graves and reburied hundreds of bodies in several secondary graves in other areas under their control. Subsequently, fearing the discovery of the secondary sites as well, they exhumed the bodies once again, and reburied them in a number of tertiary graves. Because of the crude and hasty manner in which these exhumations were conducted, remains of some bodies ended up scattered across up to four gravesites over a large geographical area. After the war, the process of exhuming the bodies was complemented by their recomposition. The International Commission on Missing Persons (ICMP) sought to establish the links between the different gravesites by identifying soil types and cataloguing the DNA of separate bone fragments, reassembling the bodies from the territories in which they were scattered. When more than 70 percent of the bone mass of a single person was collected, the bones were formally considered a single individual worthy of reburial. But these individual bodies were also ascribed a collective identity as Muslims by the religious authorities undertaking the reburials. Thus in the intervening years, the process of ethnic transformation has been completed, as victims who were shot and put into mass graves as (in their own understanding) secular Yugoslavs were disinterred with a religious identity. This ascribing of identity after death was, according to Grupa Spomenik, the product of a similar process of ethnic separation and mindset to that which led to the destruction of these people in the first place.

Part of Grupa Spomenik's and Forensic Architecture's project, Living Death Camps, included a collaboration with Caroline Sturdy Colls, a forensic archaeologist who has developed a technique of noninvasive archaeology with which she can peer into the soil in search of human and architectural remains, without digging the ground or exhuming it. Her images of the soil show no clearly defined objects, only variations in soil density and compactness. The actual nature of the blurry objects seen in the representations she produces is a matter of probability. Only when archaeology becomes physical and objects are taken out of the ground do they get separated from the soil into which they have disintegrated. Their borders need to be reestablished, and a figure emerges.

International Humanitarian Law and human rights investigations produce figurations. They tend to extract an individual (victim or perpetrator, alive or dead) from the messy physical or political ground in which they were embedded. Individual testimonies, recorded in voice or in bone, were indeed useful in personifying histories of violence and making them affective. But by concentrating on the victim and by seeking to evoke identification and compassion, such accounts tended to mask the political context.

Other developments in human rights research methodologies—such as epidemiological and demographic studies of conflict-related mortality—turned away from a focus on the single victim. While pathology deals with the individual body, epidemiology is concerned with the statistical measurement and spatial mapping of patterns of public health, disease, and mortality at the level of populations. In a seminar organized by Forensic Architecture together with the humanitarian Rony Brauman and Médecins Sans Frontières (MSF) France, we studied this biopolitical transformation, focusing on the way in which emergent techniques of collecting, analyzing, and presenting conflict-related mortality data have been used as tools of political advocacy, supporting calls for intervention or abstention in recent debates around conflicts in Sudan, Darfur, Burma, the Democratic Republic of

Congo, and Iraq, among others. While epidemiology establishes yet another relation to the witness, here as a statistical figure, the more pronounced the shift towards medical science and quantitative analysis has become, the more contested the science of epidemiology has also turned out to be.[39]

Another factor in turning the attention of human rights analysis to the earth's surface was the increased availability to the public, starting in the early 2000s, of satellite imagery. The reason here was technical. People are invisible in publicly available satellite photographs, which are degraded, for reasons of privacy and security, to the resolution in which the human body is masked within the square of a single pixel. From the satellite's orbit, events can only be registered as material inscriptions across the surface of the earth.[40] These transformations are most commonly presented in "before and after" images, as Ines Weizman and I show in this volume.

In the work of Forensic Oceanography (Lorenzo Pezzani and Charles Heller together with SITU Research) presented in this volume, the ground —which in this case was the surface of the Mediterranean Sea—is studied to establish the location of the figure. In April 2011 a boat carrying seventy-two African migrants en route to Italy ran out of petrol on the high seas. This was the time of NATO's siege of Libya and the Mediterranean was full of military vessels. The migrant boat drifted for fourteen days, without food or water, and without anyone intervening to help them, despite the obligation under international maritime law to provide assistance to those in distress. Everyone on board died, but for nine survivors. Movement on water leaves no trace. But the Forensic Oceanography team set to reconstruct the path of the boat and identify the location of military vessels in its proximity by studying the sea as a digital sensorium. The location of the place where a phone call was made by the migrants (to an Eritrean priest in the Vatican) established the starting point of the drift. Historical patterns of wind and water movements in the Mediterranean established a probable drift path. By demonstrating the proximity of the boat along its course to various military and commercial ships that could have intervened, this research has the potential to reorient the judicial process, which is still ongoing.

Field Causality

In the gestalt of human rights work, the figure (individuals/testimonies/exhumations) and the ground (collectives/territorial studies/epidemiology) occupy opposite ends of the spectrum. We needed another operative concept in order to work across the figure–ground divide. *Field causalities*, relating to the dimension of field in the field/forum divide of forensic practices, allowed us to connect individuals, environments, and artifices. They are, as our curator Anselm Franke explains, articulated through multiple foldings of figures into grounds, beings into their milieus, forms emerging out of origins, influencing these "grounds" in return. The field is not an isolated, distinct, stand-alone object, nor is it the neutral background on or against which human action takes place. Rather, it is a thick fabric of lateral relations, associations, and chains of actions between material things, large environments, individuals, and collective action. It connects different physical scales and scales of action. It overflows any map that seeks to frame it because there are always more connections and relations to be made in excess of its frame.

Field causalities challenge contemporary ways of understanding violence because they demand a shift in explanatory models and structures of causation. From a perspective informed by an understanding of field causalities, the analysis of armed conflict can no longer conform to the model of criminal law that seeks to trace a direct line between the two limit figures of victim and perpetrator, or between the two ends of a smoking gun. Establishing field causalities requires the examination of force fields, causal ecologies, that are nonlinear, diffused, simultaneous, and involve multiple agencies and feedback loops. Whereas linear causality entails a focus on sequences of causal events, field causality involves the spatial arrangement of simultaneous sites, actions, and causes. It is inherently relational and thus a spatial concept. By treating space as the medium of relation between separate elements of evidence brought together, field causalities expand the analytical scope of forensic architecture.

Field causality is a useful frame for describing forms of violence that are not ruptural, but rather slow and continuous, without clear beginnings or ends—those which might be considered to constitute an endless war defined by the permanent clash of multiple forces. Adrian Lahoud's essay—"Floating Bodies"—deals with such a form of violence as it studies the entanglement of climate change, political conflict, and war crimes in Darfur. Drawing on Locard's principle that "every contact leaves a trace," which is fundamental for modern forensics, Lahoud suggests that in certain contexts "the contact and the trace drift apart, carried away on ocean currents and diffused into the atmosphere." In a loop of positive feedback, the effects of human-induced climate change—such as the desertification in the Sahel—aggravate conflicts along it, while these armed conflicts in turn further aggravate the destruction of the environment.

Paulo Tavares's work also engages with the intersection of armed conflict and environmental destruction by looking at the way recent and contemporary conflicts across the forests of Central/South America echo the earlier patterns of colonial violence that resulted in the transformation of the entire habitat of indigenous peoples. New technologies for the detection, imaging, and modeling of ecosystems such as the Amazon basin, reveal these forests to be archaeological resources in which the spatial dispersal of plant types registers patterns of past human inhabitation and movement. Nature, as Tavares insists, is not natural, but historical and archaeological in its relation with people. It also possesses a certain agency. In Ecuador and Bolivia, legal rights are extended into the sphere of what

Tavares calls "nonhuman rights," which are the rights of nature itself as a political subject.

Forensic Architecture's investigation of the attacks conducted by government forces against the Ixil Maya people in the West Guatemalan highlands in the early 1980s sought to complement expeditions undertaken for the purpose of exhuming the victims of these wars with an account of the ways in which the natural and built environment have been the subject of systematic violence.[41] We joined the exhumation teams and attempted to find and map the locations of villages whose houses—built of organic materials—have disintegrated into the cloud forest. The Ixil had a large degree of autonomy from state control, but the military campaign sought to "close" this last frontier. The campaign's strategy included systemic forms of environmental violence that used the twin processes of construction and destruction: the massacres of civilians were complemented by the destruction of their villages, fields, and forests—the very ground on which both the *life* of the Ixil depended and on which also their *ways of life* were structured; meanwhile, government plans for the construction of model villages, roads, military installations, and large farms were intended to complete the reconfiguration of the environment as a means of exercising state control and bringing the Ixil within the fold of the state.



Fig. 14. Trekking in the mountains around Pexla Grande in search of traces of building foundations. Still from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.

Field causalities are hard to establish, particularly in court, and might end up being the "bastard's" best line of defense, in deflecting direct responsibility onto a multiplicity of different causes. The legal problems that emerge out of the shift from direct, intentional, and linear causal chains to complex, environmental causal fields are demonstrated in the work of Nabil Ahmed on arsenic poisoning. What came to be known in the late nineteenth century as the "Styrian Defense" was an argument used by those accused of using arsenic for murder, by which they explained the presence of the poison in dead bodies by pointing to its widespread presence in the Victorian domestic environment.

A similar problem in legally establishing responsibility for field causalities is exemplified in the work of the Modelling Kivalina group. Their essay in this volume starts with the failure of the legal case *Native Village of Kivalina v. ExxonMobil*. In 2008 residents of Kivalina—a barrier island situated off the northwestern coast of Alaska—filed a lawsuit in the the District Court for Northern California against twenty-three of the largest oil and gas companies in the world, charging them with contributing to climate change through the emission of greenhouse gases, and thus to the erosion of their shoreline which, they claimed, threatened the island with imminent destruction. The court ruled that the petitioners had not established direct causal chains of responsibility due to the fact that climate change is a distributed and complex process, spanning the entire earth. Against the persistent defense of a criminal trial, it is hard enough, Eric Baccard, the chief forensic scientist of the International Criminal Court, coldly informed us, to establish that a hole in a skull measuring 5.56 mm is the result of a 5.56 mm bullet, let alone to establish complex and diffused field causalities.[42]

The adequate forums for dealing with field causalities might not be found in the juridical but rather the political domain. To establish field causalities for violence and injustice is to articulate the material basis for the imperative to dismantle or fundamentally reconfigure the political field, as opposed to the standard tendency of international justice to isolate a few culpable individuals while leaving the social and economic hierarchies of a society intact.

Weak Sensors

Forensics is the product of a series of mediations and intermediaries: sensors, modes of capture, algorithms to calculate them, experts to present them, and forums to debate and decide on how to act upon them. Each of these mediators has its own grammar, and is, of course, politically conditioned in a different way.

In the task of registering political forces, proximate or remote, material form could only ever be a "weak sensor," suggestive rather than conclusive. Politics does not materialize in built (or destroyed) space as linear transformation in the same way that quicksilver, for example, translates temperature into volume. The forums are themselves never simply objective; each is located within a complex political reality that operates according to a different set of protocols, and is prone to different forms of manipulations. Each ultimately draws different limits around what can be shown and said.

Material forms can thus only reflect history in fragments and ruins, and suggest uncertain, discontinuous, and lacunar interpretations. But although we can never know the past as a conclusive, transparent fact mechanically etched into materiality, we should avoid the temptation of an anti-universalist perspective which regards truth simply as inherently relative, contingent, multiple, or nonexistent, and instead view truth as a common project under continuous construction.

States and corporations can mobilize large resources to construct their claims. But the nature of struggles for justice is that they must run counter to dominant and dominating narratives. They most often encounter not so much the "well-constructed facts" but rather the "well-constructed lies" produced by the technocrats working for rich states and corporations.[43] Political activists and other militants strive thus not on the solid ground of state-sponsored science but rather on weak signals, often at the threshold of visibility, pushing against the flood of obfuscating messages, of dominant narratives, fabricated noise, and attempts at denial. It is precisely because of the inherently fuzzy nature of forensis and the fragility of its truth claims that political mobilization is essential and commitments are necessary. At the same time, without the ambiguity of material investigation, politics would simply become the implementing arm of a calculative automaton.

The investigations conducted by members of the Forensic Architecture team across the battlefields of contemporary frontier wars were tuned to and mobilized around weak signals that were sometimes barely perceptible.

A faint and blurry line in a single frame of a video shot by a videographer/activist along the wall in Palestine demonstrated, against all efforts at state denial, that a gas cartridge was fired by an Israeli soldier, directly aiming at and killing a peaceful demonstrator (see "Case: Bil'in").

A few scattered pixels, a little lighter than those surrounding them, suggested, in the absence of other photographic documentation, the impact of a missile fired by a drone at the dusty ground of a town in Pakistan's western frontier regions, where more than forty civilians were killed, contrary to the US attempt at denial (see "Case: Drone Strikes").

Blurry footage shot by a member of the Gaza solidarity flotilla—and saved only because it was swallowed, most likely, by an activist seeking to protect it from being confiscated by the military—in Maayan Amir's essay shows the way in which an activist boat came under fire in the legal limbo of international waters.

The probable drift path of a boat carrying dozens of migrants dying of thirst and hunger, constructed using the after-work calculations of an oceanographic laboratory incorporated into a report of the Forensic Oceanography group, allowed the public to see how close this distressed boat was to many commercial and military vessels that ignored the plight of those on board.

Small changes in the density of vegetation detected in a sequence of satellite images taken from above the Atacama Desert suggest that, as Godofredo Pereira elaborates, a state-sponsored corporate mine is stealing the little water left to sustain the lives of a struggling native community.

It is precisely because the material and media flotsam we have been examining are not the hard evidence of a "well-constructed," peer-reviewed science that they can potentially be in excess of science. Their aesthetic power exists in their potential for refuting state-sponsored mechanisms of denial, obfuscation, and manipulation that were established by those that control not only the depth of space, but also its interpretation.

Unlike science, politics is not driven by a desire for a well-constructed truth, and unlike law it does not seek to render judgment on past events from the vantage point of the present order: rather, it is driven by a desire to change the way things are.

An important component in our ability to respond to political challenges is the capacity of forensis to move beyond detecting, calculating, processing, and presenting acts of injustice. Achieving a heightened aesthetic state of material sensitivity, tuned to weak signals, must be enhanced by a sensitivity to the materiality of politics: this entails an appreciation that whether you are a building, a territory, a pixel, or a person, to detect is to transform, and to be transformed is to feel pain.

1 See the entry *forensis* in the lexicon of this volume.

2 On the political and aesthetic implications of animism, see Anselm Franke, "Animism: Notes on an Exhibition," *e-flux Journal,* no. 36 (July 2011), http://www.e-flux.com/journal/animism-notes-on-an-exhibition/.

3 See Thomas Keenan, "Getting the dead to tell me what happened: Justice, prosopopoeia, and forensic afterlives," in this volume; and Thomas Keenan and Eyal Weizman, *Mengele's Skull: The Advent of a Forensic Aesthetics* (Berlin: Sternberg Press, 2012), 28. Quintilian discusses prosopopoeia in Book 9, Chapter 2 of his *The Orator's Education*, trans. Donald A. Russell (Cambridge, MA: Harvard University Press, 2001).

4 Miguel Tamen, *Friends of Interpretable Objects* (Cambridge, MA: Harvard University Press, 2004), 79–80.

5 Quintilian, *The Orator's Education*, Book 4, Chapter 2, 63. For a discussion of this subject see Carlo Ginzburg, *Threads and Traces: True False Fictive*, trans. Anne. C. Tedeschi and John Tedeschi (Berkeley: University of California Press, 2012), 7–15.

6 Eyal Weizman, "Osteobiography: An Interview with Clyde Snow," *Cabinet*, no. 43, "Forensics" (Fall 2011): 68–74.

7 If popular entertainment is any indicator of the cultural shift towards forensic fetishism then it is significant that—from *CSI* to the novels of Patricia Cornwell and the former forensics expert Kathy Reichs—the scientist-detective has gradually taken the place of the psychologist/psychoanalyst-detective popular in TV drama throughout the 1980s and 1990s.

8 See Anselm Franke, "The Forensic Scenography," in this volume.

9 We worked in collaboration with SITU Research on many of our investigations.

10 Rabih Mroué's lecture-performance *The Pixelated Revolution* (dOCUMENTA 13, Kassel, 2012) demonstrated means by which to interrogate such material.

11 Meg McLagan and Yates McKee, eds., *Sensible Politics: The Visual Culture of Nongovernmental Activism* (New York: Zone Books, 2013).

12 See Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2011), especially the section "A Legislative Attack" in chapter 3.

13 Caroline Wyatt, "Legal Claims 'Could Paralyse' Armed Forces," *BBC News,* October 28, 2013, http://www.bbc.co.uk/news/uk-24576547. On the conception of threat posed by legal action see Thomas Keenan and Eyal Weizman, "The Third Strategic Threat," *OpenDemocracy*, June 7, 2010, http://www.opendemocracy.net/thomas-keenan-eyal-weizman/israel-third-strategic-threat. On the military conception of Lawfare, see Charles J. Dunlap, "Lawfare: A Decisive Element of 21st-Century Conflicts," *Joint Force Quarterly*, vol. 3 (2009): 34–39, at 35.

14 Thomas Keenan, "Photography and Counter-forensics," *Grey Room*, no. 55 (Spring 2014).

15 Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone books, 2010).

16 In this and other ways, *Forensis* continues the trajectory of research exhibitions at the Haus der Kulturen der Welt curated by Anselm Franke such as "Animism" (2012) and "The Whole Earth" (2013), with Diedrich Diederichsen.

17 Sam Kubba, *Architectural Forensics* (New York: McGraw-Hill Professional, 2008). See Dale Paegelow, *Forensic Architecture: An Introduction* (Patterson: Cromlech Architect, 2001), www.cromlech-architect.com.

18 For Bruno Latour aesthetics designate the ability to perceive and to be concerned, "to render oneself sensitive, a capacity that *precedes* any distinction between the instruments of science, of art, and of politics." See "The Anthropocene and the Destruction of the Image of the Globe," Latour's fourth Gifford Lecture, Edinburgh, February 25, 2013, http://www.ed.ac.uk/schools-departments/humanities-soc-sci/news-events/lectures/gifford-lectures/archive/series-2012-2013/bruno-latour/lecture-four.

19 Forensic Aesthetics was the title of a series of seminars I taught with Thomas Keenan and Nikolaus Hirsch at the Städel School in Frankfurt in the academic year 2010–2011, http://www.staedelschule.de/forensic_aesthetics_d.html. Keenan and I developed the concept further in *Mengele's Skull*.

20 Sometimes, the composition of dust itself is a form of evidence in which body and building parts are intermingled. See Füsun Türetken, "Breathing Space: The Amalgamated Toxicity of Ground Zero," in this volume; and Susan Schuppli, "Impure Matter: A Forensics of WTC Dust," in *Savage Objects*, ed. Godofredo Pereira (Guimarães: Fundaçao Cidade de Guimarães, 2012), 120–40.

21 Fredy Peccerelli, in Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min., http://vimeo.com/36971048.

22 Sujaul Khan, "Never again," *Daily Star*, April 30, 2013. See also Ravi Nessman, "2 Bangladesh Garment Factories Show Effort, Lapses," Associated Press, June 21, 2013; and Bangladesh University of Engineering and Technology, "Collapse of Rana Plaza in Savar: Structural Point of View," undated, http://www.buet.ac.bd/jidpus/wp-content/uploads/2013/05/Fact-findings-of-Rana-Plaza1.docx, last accessed January 2014.

23 Karl Marx, "Condition of Factory Labourers," April 7, 1857 (first published in *New York Daily Tribune,* no. 4994, April 22, 1857), http://marxengels.public-archive.net/en/ME1006en.html. Thanks to my colleague John Hutnyk for bringing Horner to my attention, twice. See http://hutnyk.wordpress.com/2012/01/27/leonard-horner-hall/.

24 Dana Behrman, "Born again Landscape: The Politicization of Archaeology and Architecture, the Case of Wadi Hilwa/City of David, East Jerusalem," master's dissertation, Centre for Research Architecture, Goldsmiths, 2010.

25 Arjun Appadurai, "Commodities and the Politics of Value," in *The Social Life of Things: Commodities in Cultural Perspective*, ed. Arjun Appadurai (Cambridge: Cambridge University Press, 1988), 3–63. This is similar to the task performed by the character of Martha Rull in Heinrich von Kleist's forensic comedy *The Broken Jug*. The trial is tasked with reconstructing the events that led to the breaking of a jug. Despite the protests of the judge (he was the person who broke the jug), Martha uses the shards to describe the destruction wrought on sixteenth-century Europe: "You see / The bits, that's all, the bits that used to form / The loveliest jug of all. You see this hole? / Well, there you once could see how Charles the Fifth / —Such lovely robes he wore—how he handed / The Netherlands over to his son Philip." Heinrich von Kleist, *The Broken Jug: A Comedy*,

trans. Roger Jones (Manchester: Manchester University Press, 1977), 27. This first came to my attention in Cornelia Vismann, "The Love of Ruins," *Perspectives on Science*, vol. 9, no. 2 (2001): 196–209, at 200.

26 In the wake of the war-crime investigations following Israel's 2008–2009 attack on Gaza, one of the world's foremost "forensic architects," assembling evidence against the military, was suspended when it was publicly revealed—to great media fanfare—that he was a collector of Nazi-era fetish items, and thus allegedly unsuited to impartially investigating the Israeli military. I thought that, if true, shouldn't the fact that he had such a collection, to the contrary, increase his credibility? See Weizman, *The Least of All Possible Evils*, 99–136.

27 See, for example, S.C. Res. 808, U.N. SCOR, 48th Sess., 3175th mtg., U.N. Doc. S/RES/808 (1993); and Letter dated 10 February 1993 from the Permanent Representative of France to the United Nations Addressed to the Secretary-General, U.N. Doc. S/25266 (report of the Committee of French Jurists).

28 Allison Marston Danner and Jenny S. Martinez, "Guilty Associations: Joint Criminal Enterprise, Command Responsibility, and the Development of International Criminal Law," *California Law Review,* no. 93, no. 1 (2005): 75–169.

29 See Laura Kurgan, "Residues: ICTY Courtroom No. 1 and the Architecture of Justice," *Alphabet City 7: Social Insecurity* (2001): 112–29; and Cornelia Vismann, "Tele-Tribunals: Anatomy of a Medium," trans. Sara Ogger, *Grey Room*, vol. 10 (Winter 2003): 5–21. For more recent developments, see "TV Cameras Allowed into Court of Appeal," *BBC News,* October 31, 2013, http://www.bbc.co.uk/news/uk-24744684.

30 Shoshana Felman and Dori Laub, *Testimony: Crises of Witnessing in Literature, Psychoanalysis and History* (London: Routledge, 1991); Annette Wieviorka, *The Era of the Witness*, trans. Jared Stark (Cornell: Cornell University Press, 2006).

31 G. W. F. Hegel, "Observation of Self-consciousness to Its Immediate Actuality: Physiognomy and Phrenology," in *The Phenomenology of Mind*, trans. J. B. Baillie (London: Harper and Row, 1967).

32 Michal Givoni, "Witnessing in Action: Ethics and Politics in a World without Borders," http://roundtable.kein.org/node/1077, last accessed January 2014.

33 Primo Levi, *The Drowned and the Saved*, trans. Raymond Rosenthal (New York: Summit Books, 1988), 83. See also Adam Rosenblatt, "International Forensic Investigations and the Human Rights of the Dead," *Human Rights Quarterly,* vol. 32, no. 4 (November 2010): 921–50.

34 Christopher Joyce and Eric Stover, *Witnesses from the Grave* (New York: Little Brown & Co, 1991).

35 Godofredo Pereira, "Dead Commodities," *Cabinet*, no. 43, "Forensics" (Fall 2011): 90–94.

36 Simon Romero, "Latin America Brings Up Its Dead, Seeking Truth to Help Settle the Past," *New York Times*, October 16, 2013.

37 Isabel Kershner, "Swiss Report Supports Theory Arafat Was Poisoned," *New York Times,* November 6, 2013.

38 Keenan and Weizman, *Mengele's Skull*, 13.

39 Forensic Epidemiology: Mortality Research in the Field and Forums of Contemporary Conflict, workshop organized by CRASH/MSF and the Centre for Research Architecture/Goldsmiths, December 7–8, 2012, http://www.forensic-architecture.org/audio-video/rt-forensic-epidemiology/. Debates in the seminar centered around the political decisions that go into the making of statistics: whose deaths should be measured and calculated, what is to be left outside of calculations, and what is deemed incalculable.

40 Laura Kurgan, *Close Up at a Distance: Mapping, Technology and Politics* (New York: Zone Books, 2013).

41 The research, presented in "Case: Guatemala" in this volume, was coordinated by Paulo Tavares with Daniel Fernández Pascual, in collaboration with SITU Research.

42 Meeting between Dr. Baccard and Forensic Architecture (including the author), March 2012.

43 Bruno Latour, *On the Modern Cult of the Factish Gods* (Durham, NC: Duke University Press, 2010). Although some of the formulation of "forensis" draws upon ideas articulated by Latour's work, in forensic architecture we differ from Latour in maintaining that the kind of truth which political activists and other militants produce cannot be the "well-made truth" of institutionalized science, but rather constitutes research that finds traces of ruptures and gaps in the dominant and "well constructed lies" of rich states and corporations.

TRUTH



Getting the dead to tell me what happened: Justice, prosopopoeia, and forensic afterlives

Thomas Keenan

> Almost as soon as the sun touched them, the bones started telling their stories.
> — Clyde Snow[1]

It began with a seminar. It was September 2009, and in London there was a new group of students at the Centre for Research Architecture at Goldsmiths, directed by Eyal Weizman. He suggested I open the seminar that year with "something rather theoretical and challenging on images/politics," and explained the context as follows: "The yearly theme I have set for the center is 'forensics,' which I take to mean in broad terms the public claims that can be made on behalf of objects/spaces in forums such as courts or other publics."

At the round table that afternoon we talked about visibility and evidence, the agency and non-self-evidence of images, testimony, and truth, as we discussed (among other things) Jacques Derrida's reading of the Rodney King videotape in the trial of his attackers, and Okwui Enwezor's interpretation of the prominence of human rights and documentary in contemporary art.[2]

In honor of the word "forensics," I brought along my primary points of reference for it at that time: Gilles Peress and Eric Stover's book on the work of forensic teams in the aftermath of the wars in Bosnia and Croatia, *The Graves*; a film produced by the NGO WITNESS about the work of the Argentine Forensic Anthropology Team (EAAF), *Following Antigone*; and a number of news stories about mass-grave exhumations conducted for the International Criminal Tribunals for the former Yugoslavia (the ICTY) and Rwanda (the ICTR).[3] In those articles, we were struck by a rhetorical operation that seemed to reappear regularly, for instance here:

> William D. Haglund, a forensic anthropologist from Seattle, finished taking body No. 467 from the gravesite just before noon on a recent day. He zipped the remains in a plastic body bag and carried them up to tables where pathologists were reconstructing shattered skulls and severed bones. He put the muddy remnants of the victim's clothing in a shopping sack and wrote the number on the outside. "The dead are speaking to us," he said. "We are interpreting for the dead. The dead are telling us the same story that the living told the investigators. But this is the first time on this scale that they have been allowed to speak."[4]





Figs. 1, 2. (above and previous pages) Forensic anthropologist William Haglund with an investigative team from the International Criminal Tribunal for the former Yugoslavia, at the Pilica Farm mass grave near Srebrenica, Bosnia, Fall 1996. Photo: Gilles Peress/ Magnum Photos.

The trope was familiar, if jarring: it is what scholars of poetry and persuasion call *prosopopoeia*—the attribution of a face and a voice to something inanimate.[5] It came up recurrently in writing on forensic anthropology, including in this phrase from the pioneering forensic anthropologist in the field of human rights, Clyde Snow: "I'm not an advocate, I'm an expert. Unless you maintain … objectivity, you lose credibility. … and the best way is to let the bones speak for themselves."[6]

Of course, they can't. But they have started appearing in international courts, war crimes trials, human rights investigations, and public forums, where they do something like testifying: things are speaking, without saying a word. In the seminar, we talked about this strange oscillation between the human and the nonhuman, the living and the dead, and about the way in which the forensic project seemed—in the name of human rights—to blur those distinctions regularly with this figure of speech. Of course, Snow's term "objectivity" was a contested one, but another more practical sense of it seemed to emerge in this context: the dead, the skeletal remnants left behind when people are killed, were being presented and interpreted (which is a somewhat less contentious way of saying "the dead are speaking to us"), and these objects were enabling claims to be made, positions to be taken, justice to be pursued. The means by which this was happening, though, seemed enigmatically encoded in the figure of "allowing the bones to speak." How do objects, especially human remains and ruins, become significant—start to signify—when they are identified, introduced, enlisted, and fought over, as evidence in political and juridical forums?

It was this spectral status of the bones—in life they recorded something, accepted the imprint of all sorts of events, and in death allowed for the possibility that what had been left behind could be made to signify, in another world—that seemed most interesting about forensics.

*

In *Mengele's Skull*, the book Weizman and I went on to write about "forensic aesthetics," we explored the attempt to introduce human remains as evidence in the prosecution of human rights violations, which first emerged in Latin America in the mid-1980s in two apparently different but structurally parallel contexts.[7]

The first human rights forensics team in the world was constituted by a group of Argentine students in the summer of 1984, initiated by Clyde Snow, who had come there in February with a delegation of forensic scientists from the American Academy for the Advancement of Science (AAAS), at the invitation of the National Commission on the Disappeared (CONADEP).[8] The dirty war in Argentina had given the world a new word and concept: "the disappeared (*los desaparecidos*)." The following year, in an ironic inversion of the first context, the state-of-the-art techniques in the forensic identification of missing persons received their most decisive test, and worldwide publicity, in the international investigation of the body of the Auschwitz doctor Josef Mengele, in Brazil.



Fig. 3. Photographs of Josef Mengele overlaid on images of a skull, believed to be his, in Richard Helmer's face-skull superimposition demonstration, Medico-Legal Institute labs, São Paulo, June 1985. Photo: Richard Helmer, courtesy of Maja Helmer.

In telling the story of that emergence of forensic operations into the field of human rights, and its complex relation to the historic privilege of the witness and the document, we were struck both by the role that images played in the process—the decisive technique in the Mengele identification involved the superimposition of video images of the skull and of a photograph of the person—and by the analogy, for lack of a better word, between human remains and the structure of the photograph. They are constituted both by a complex process of imprinting, a recording of impressions, which enable or provoke some interpretive labor and the possibility of a retelling of that process, but equally by a fundamental lack of absolute certainty,

a debateability that makes them properly, or etymologically at least, forensic. (The word forensics comes from the Latin *forensis*, belonging to the forum, which is to say, the art of public persuasion and debate.) We wrote:

> To the untrained eye, bones look similar—skulls are devoid of the expression and the gestures of a human face. But the bones of a skeleton are exposed to life in a similar way that photographic film is exposed to light. A life, understood as an extended set of exposures to a myriad of forces (labor, location, nutrition, violence, and so on), is projected onto a mutating, growing, and contracting negative, which is the body in life. Like a palimpsest or a photograph with multiple exposures, bones can be quite complicated to interpret.[9]





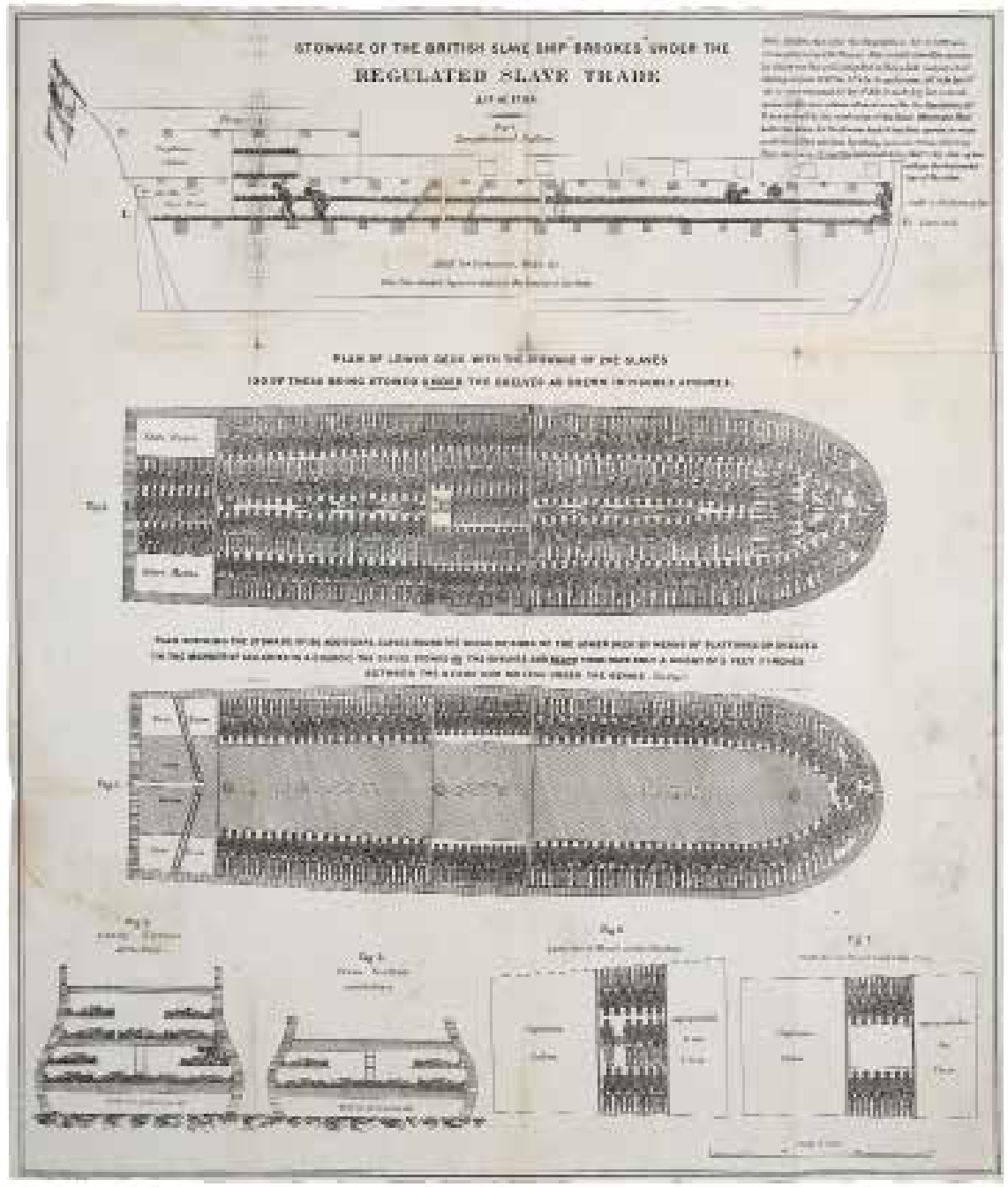
Fig. 4. (above left, from left to right) Forensic scientists Daniel Romero Muñoz and Richard Helmer, with police chief Romeu Tuma, present photographs from the Mengele face-skull superimposition at a press conference, São Paulo, June 21, 1985. Video still: ABC News VideoSource.

Fig. 5. (above) Clyde Snow presents a slide of the skull of Liliana Pereyra, evidence gathered by the Equipo Argentino de Antropología Forense (Argentine Forensic Anthropology Team), at the trial of members of the Argentine junta, Buenos Aires, April 24, 1985. Photo: Daniel Muzio/AFP/ Getty Images.

In other words, bones and photographs share the structure of an imprint: the moment and forces of the impression are gone forever, but they have left behind something to be read. The sun makes its mark, and so do accidents, jobs, ancestry. The medium on which the trace is registered is not an entirely neutral or passive one; it has a grain and a resolution, it can record some things and not others, it can retain them for longer and shorter periods of time, it affects what it accepts. The traces can, often, be read and interpreted. But they are mute witnesses, and their "language" is not always—or ever—unequivocal; they need interpreters, translators, if they are persuasively to demonstrate anything. "We are interpreting for the dead," says Haglund. Around the bones and the images, and their complex mix of legibility and inscrutability, grows a forum, a space of debate; they are objects in dispute, and more than one interpreter can make claims about what they have to say.

*

In *Bury the Chains*, Adam Hochschild suggests that the modern human rights campaign began with the eighteenth-century British movement to end the slave trade, and points in particular to the 1788 drawing of the slave ship *Brookes* made by Plymouth abolitionists and perfected by Thomas Clarkson. It was straightforward and geometrical: "a diagram, with top, side, and end views, of a fully loaded slave ship. […] It gave measurements in feet and inches while showing the slaves closely lined up in rows, lying flat, bodies touching one another or the ship's hull."[10]



The image was at once detailed and simple, descriptive and emotionally powerful, and it spread quickly, reproduced in "newspapers, magazines, book, and pamphlets,"[11] printed as a poster, and included in Clarkson's landmark *Abstract of the Evidence*, delivered before the House of Commons in 1790 and 1791. This volume, says Hochschild, "reads more like a report by a modern human rights organization than the moralizing tracts against slavery that had preceded it."[12] It was a presentation of *evidence*, and it "simply cited, in a crisp and businesslike way, statistics, documents, and sworn testimony."[13] At its center was the diagram of the *Brookes*, carefully drawn and measured, "precise, understated, and eloquent in its starkness."[14] Hochschild says: "Clarkson and his comrades somehow sensed that they could better evoke sympathy if they stood back and let the evidence speak for itself."[15]

"Let the evidence speak for itself." The story of the image of the *Brookes*, perhaps the first forensic visualization in the history of human rights campaigns, exemplifies a recurrent paradox of such projects: what seems to be obvious, isn't. "Am I not a man and a brother?" asked the other famous image of the antislavery movement, Wedgewood's medallion.[16] Does the question need to be asked? The rhetorical form of the question implies that it doesn't, but the question can also—and indeed must (that was the point)—be taken seriously. Without an affirmative answer, nothing will change. The evidence never seems to speak for itself, at least not loudly enough. And so it needs to be shown, demonstrated, stated, claimed, proved… made evident to others. Those demonstrations do not always convince, and even more rarely do they succeed in generating the kinds of responses to what is being shown that make it either go away, if it's unjust, or secure it, if it's a claim. (Legal emancipation for the enslaved people of the British Empire did not come until 1838.) In a variety of different contexts, across a range of media, the discourse of human rights seems to turn fundamentally around this question of evidence—its discovery or its production, its presentation, and its reception. But, in spite of our common sense notion of evidence as proof, this field is quite unstable.

Here is a proposition that seems, strangely, to be at once empirically trivial but also philosophically risky: we are not self-evidently human. Arguing for one's rights, or against their violation, is ultimately reducible to claiming that one belongs to the human community, that one's status is human. But that argument needs to be made—it does not go without saying. The human status appears to be rather uncertain, not secured by anything, subject to regular challenge and contest. It is not guaranteed by anything but other humans, and they are not good at guarantees.

Evidence of *this* seems to abound in the world today. People routinely are not treated the way we might expect them to be—they are tortured, trafficked, enslaved, targeted, disappeared, murdered, censored, exploited, and discriminated against. They seem not to count as human beings, not to qualify for the protections that ought to pertain to them. They are, in effect, not recognized as being human, or have somehow had that status revoked. We see and hear about this all the time: human beings are not (treated as) humans.





Figs. 7, 8. Expert witness Sgt. Charles Duke (left) and defendant Officer Theodore Briseno (right) testify about events shown in George Holliday's videotape of Los Angeles police officers beating motorist Rodney King, at the officers' trail, Simi Valley, California, April 1992.

In other words, the category, and this is why it can be seen as philosophically risky, is ungrounded—hence the repeated efforts of philosophers to specify or deny the "foundations" of human rights. But perhaps these efforts are both impossible and unnecessary: human rights discourse is expressive, paradoxically, of the idea that membership in the human community is not something given in advance. There is a (quasi-)fundamental openness or instability in the concept of humanity, even if we all too often treat the violation or non-recognition of human status as something on the order of a mistake, a confusion, an accident, which is to say, something amenable to a technical correction, an enlightening response, or an enforcement action. The problem goes much deeper than this—all the way down, in fact, and this groundlessness is constitutive of the concept. Moreover, this is not a critique, at least not in the ordinary sense of an argument that demands a better, more secure, concept. The predicament is a challenge to and an opportunity for us.

Here is how Hannah Arendt posed this problem in her chapter on human rights and the nation-state in *The Origins of Totalitarianism*:

> Man of the twentieth century has become just as emancipated from nature as eighteenth-century man was from history. History and nature have become equally alien to us, namely, in the sense that the essence of man can no longer be comprehended in terms of either category. On the other hand, humanity, which for the eighteenth century, in Kantian terminology, was no more than a regulative idea, has today become an inescapable fact. This new situation, in which "humanity" has in effect assumed the role formerly ascribed to nature and history, would mean in this context that the right to have rights, or the right of every individual to belong to humanity, should be guaranteed by humanity itself. It is by no means certain whether this is possible.[17]

The key word is "guarantee," and her polite understatement of the impossibility of any such guarantee is one of the few concessions to human rights orthodoxy in her otherwise corrosively critical chapter. Membership in this open-ended community, then, is something that is negotiated, interpreted, demanded; nothing guarantees it *a priori*. Given this, this non-self-evidence of human status, a lot of other evidence is required.

*

Evidence, in English, is a matter of appearance, of sight, of what manifests itself before the eye or in the realm of visibility. What

is evident is what appears, what comes into the light, what comes out into sight. The Latin root is *ex-videre*. To be evident is to be obvious, clear, visible. This does not have to happen naturally—evidence here is what enters or is admitted into a specific domain of visibility or audibility—but it is nevertheless only that which is presented to the senses, that which can be seen or heard.

United States law (and perhaps that of other states as well) takes this definition rather literally, even materially, which is to say minimally. Evidence means neither truth, nor proof; it implies nothing incontrovertible. It simply is what is there, not in the world but in the legal forum, whatever has entered into the specific time and place of juridical appearance and on which a decision can be based. It is that which appears before a judge or a jury for their interpretation, the material for their decision about what, in fact, the facts of a given case are.

In the penultimate moment of an American criminal trial, the judge usually instructs the jury about their role, and in particular about the material on which they are to base their verdict. The judge reminds the jury that their responsibility is simply to determine the facts in the case, not to interpret the law: the law is a formal grid that determines whether what happened constituted a crime. The jury decides what happened, they "try the facts," they answer the question: what took place? And they do it by assessing the evidence. The US Attorney's Office, the office of federal prosecutors in the United States, exemplifies this with a sample of a judge's instructions to a jury on the question of evidence. The judge says:

> It is your duty to find from the evidence what the facts are. You will then apply the law, as I give it to you, to those facts. You must follow my instructions on the law, even if you thought the law was different or should be different.
>
> Do not allow sympathy or prejudice to influence you. The law demands of you a just verdict, unaffected by anything except the evidence, your common sense, and the law as I give it to you.
>
> The "evidence" in this case consists of the testimony of witnesses, the documents and other things received as exhibits, [and the facts that have been stipulated—that is, formally agreed to by the parties]. […] You may use reason and common sense to draw deductions or conclusions from facts which have been established by the evidence in the case.[18]

Their understanding of the word is quite simple, then, but the simplicity does introduce a complication: evidence is defined as "information presented in testimony or in documents that is used to persuade the fact finder (judge or jury) to decide the case for one side or the other."[19]

Evidence is what is used to persuade. It does not mean what is true. In fact, it is precisely *not* that. It is not the matter of fact. Evidence does not convict, nor does it decide, nor does it settle or conclude or determine. It is that *upon which* a decision can be rendered about what the facts in a case are. A judge or a jury decides, or finds, or *tries*, those facts, in response to the evidence.

In other words, once again, evidence is precisely that which is not self-evident. It becomes evident only in the ears and eyes of others. It is not an answer, but a question: it asks for a decision, for a reading or an interpretation, it asks to be told what it says. To say that something is a "question of evidence" is to speak redundantly: evidence is always a question.

To that question, two different sorts of responses can be given. There is the speech of judgment, the decision about what happened and what we conclude the evidence tells us. In a trial, this almost always happens. But a decision is not the only thing called for. If evidence is what is used to persuade, then we also need to attend to the acts and arts of persuasion, which is to say, to the rhetorical operations through which what is presented in evidence is presented to those who decide. This attention is another, equally important, form of response.

*

In Ed Vulliamy's remarkable account of migration, *maquiladoras*, and the drug wars along the US-Mexico border, *Amexica*, he introduces us to some of these interpretive/rhetorical operations, personified by a dedicated, and dissident, forensic pathologist named Dr. Hiram Muñoz, who studies the bodies left behind in Tijuana's epidemic of narco-violence.[20]

The bodies come to him disfigured in a variety of horrible ways—Vulliamy offers a vivid catalog of incisions, punctures, and removals—and Muñoz understands his task to be one of treating those marks as inscriptions, and decoding them. The bodies and skeletons that arrive for his examination bear the traces of a range of life-histories, but that is not his primary concern. The manner of death, and its symbolic language of mutilation, is his text. Vulliamy cites Muñoz's explanation of how he reads the codes:

> "Each different mutilation leaves a clear message. They have become a kind of folk tradition. If the tongue is cut out, it means they talked too much—a snitch, or *chupro*. A man who squealed on the clan has his finger cut off and maybe put in his mouth." This is logical, a traitor is known as a *dedo*—a finger. […] "Severed arms could mean that you stole from your consignment, severed legs that you tried to walk away from the cartel. Decapitation is another thing altogether: it is simply a statement of power, a warning to all, like public executions of old. The difference is that in normal times, the dead were 'disappeared' or dumped in the desert. Now they are executed and displayed for all to see, so that it becomes a war against the people."[21]

Figs. 9–12. (overleaf) Fernando Brito writes: "The idea of this project is to show a person lying on the ground, a person leaving his family and relatives grieving over his loss. It attempts to prove that a human being is not just a number and to show that something is wrong, that this sort of death is not normal and to try and increase people's sensitivity." From the series Tus pasos se perdieron con el paisaje (Your Steps Were Lost in the Landscape, 2011). Photos: Fernando Brito.









But having learned to translate this basic language, he admits to a particular interest in the incisions themselves, not the parts present or absent, but the traces of the surgery, for lack of a better word, performed by the medical students working with the cartels. "They are the ones trying to speak to us. I look at a cut-off toe. How was it done? Was it done well? Was it done from the left or the right? If it was done well, exactly between the bones, the person is more dangerous. […] If it's just hacked off, we're dealing with a *mana*, a street thug. You need to cut it properly if you are going to send it to the victim's family, or the police."[22]

He protests to Vulliamy that his exhaustive labors rarely result in justice. "The authorities don't look at any of this socially or forensically […] no one takes any notice. The narcos give us signs, they leave unique marks, like fingerprints, only the authorities do not heed them."[23] Nevertheless, he says, "my job is to interrogate the corpse, to ask it questions. Because the dead cannot speak, I have to find ways of getting them to tell me what happened."[24] Later, Vulliamy writes, Muñoz "defines his work as 'spending my life trying to scientifically interrogate people who cannot talk, who have suffered terrible pain but now feel nothing. They can communicate silently through the terrible things that have been done to them. I have to look for a cause, not a result. I have to rewind the movie, work out what was done, and why.'"[25]

"Rewinding the movie" is not just one metaphor among others. The bodies Muñoz examines, whether as bones or as flesh, bear the temporally dense and layered traces of the violence inflicted on them. Life-stories—"osteobiographies," as Snow calls them—are embedded in bones: not just the obvious markers of age, weight, height, gender, handedness, and so on, but histories of labor (a job that involved walking looks different in the bones than a job that required sitting at a desk), nutrition, geography, health, and so on. Life-stories, and death-stories: how many bullets, what sort of bullets, from what weapon, at what range, at what angle? Were the hands bound, the eyes blindfolded? And so on—to all these questions a skeleton can offer answers. Likewise, the flesh appears differently depending on what has been done to it—Muñoz is a very close reader of these imprints. But he is not only a reader or a listener or a watcher—he must also retell these stories, replay or narrate the film that no one else sees, give words to the silent communication of the corpses.

Part ventriloquist, part archaeologist, Muñoz lends words to the dead, showing what remains of them and offering an account of what they cannot say. He is a specialist, precisely, in the art of prosopopoeia, a giver—or an imposer—of voice and of face. "Because the dead cannot speak, I have to find ways of getting them to tell me what happened." Rewound, the film exhibits its imprints; starting with what is left behind, with what cannot be undone, Muñoz can nevertheless try to reverse time narratively and allow the story, if not the person, to return. But if the corpse tells what happened, it does so in a borrowed language, in words not its own. Its silent communication is

transmitted through the traces of things that happened, which is to say, through things alone.

Communication, as Derrida pointed out long ago, doesn't only mean communication of a meaning. Muñoz tends to look for meanings, for messages in the traditional sense: this one was a snitch, that one trespassed, this other one stole. He privileges, because he fears them, the work of the professionals, the expert emitters of distinctive—even eloquent—semiosis. But another one of Vulliamy's sources, an anthropologist named Cecilia Ballí, tells him that while "specific types of violence exerted on the body can serve as a form of communication," this is not to say "that violence always means something."[26] And Muñoz is equally aware that not all communications are significant, that not all messages transmit a meaning—some simply, or not so simply, communicate a force, perform, announce the existence of the speaker, or exemplify the possibility of violence.

*

The medical students are craftspeople, of a sort, but sometimes evidence is produced automatically. In a sense, that is what the forensic anthropologists confront as they decipher osteobiographies, at least in part: life has left its traces, unauthored and unintended, in and on the bones that remain.

Machines can also generate forensic material automatically. One of the great virtues of Vulliamy's story of drug violence in contemporary Mexico is that it's not only about drug violence, but also about NAFTA (the North American Free Trade Agreement), duty-free factories, US border security, the disappearance and murder of young women in Juárez, smugglers and the traffic in migrants. And of these migrants, or some of them, astonishing automatically produced evidence exists.

On more than one occasion now, X-ray ("backscatter") scanners installed at US customs posts on the border with Mexico, and at checkpoints throughout much of Mexico itself, have generated images that send us back to the *Brookes*: traces of a contemporary trade in people, transported in conditions that rival those of centuries earlier. The *New York Times* reported in May 2011:

> When police ran X-ray scanners over two cargo trucks at a checkpoint in southeastern Mexico on Tuesday, they made a surprising discovery: Inside the trailer were the ghostly shadows of 513 migrants—some suffering from dehydration—packed together in near-suffocating conditions. The police released an image of the harrowing scan, which shows how migrants sat in tight bundles or stood clutching cargo straps for hours of clandestine travel from beyond Mexico's border with Guatemala.[27]

Long after the formal abolition of slavery, the profitable trade in people persists (at $7,000 per person, this "cargo" of migrants from Latin America and Asia was worth more than $3.5 million to the smugglers). What has

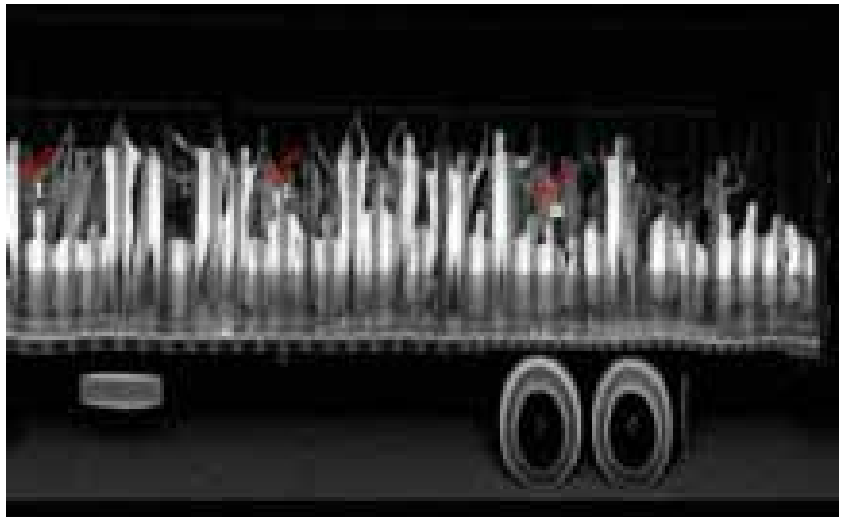


Fig. 13. Migrants from Latin America and Asia are seen in a trailer truck after being detected by police X-ray equipment, near Tuxtla Gutierrez, in Mexico's state of Chiapas, in this photo released by the Chiapas State Attorney General's office on May 18, 2011. Two trailer trucks heading to the United States and containing about 513 migrants were discovered the previous day at a checkpoint. Source: Government of Chiapas, via European Pressphoto Agency.

changed, though, is that the images from Chiapas needed almost no human intervention to appear before us: no gathering of statistics, no measurements of the hold, no testimonies about cargo and conditions, no drawing and redrawing of the diagram. A machine, probably outfitted with analytic algorithms that detect anomalies, produced the image and noticed the people—there, where people were not supposed to be.

In the "ghostly" images, something like another voice from the grave was registered, and although the migrants did not reach their destination, nor was the traffic in people stopped, the image that captured that cry saved their lives. Many others did not share that fate.[28]

There are similar machines everywhere today, tracking, counting, recording and monitoring data, images, and sounds, generating an uncountable quantity of evidence of all sorts of things. Often that evidence remains secret or in the hands of commercial enterprises or governmental authorities, but sometimes it becomes public or can be acquired—or even commissioned—by citizens, activists, and NGOs.

Evidence of this sort has become a significant resource for another kind of human rights forensics. Although the Chiapas images, and most others like them, are produced by states or interstate agencies for the purpose of intercepting and stopping migration, their political force is not limited to that enforcement operation, as the analogy with the *Brookes* images suggests.

Sometimes that repurposing of surveillance imagery becomes part of an activist, oppositional project, as for instance in the case of another migrant ship, the so-called "left-to-die boat" that set out in March 2011 for southern Europe from Tripoli. In the midst of NATO's air and sea operation against the Libyan regime, it was encountered and not rescued by a variety of warships and aircraft after it lost power and drifted, ultimately landing back on the Libyan coast. Of the seventy-two people on board, only nine survived the fourteen days of the voyage.[29]

The sea is said to leave no traces. But the course of the ship could be reconstructed, using GPS tracking information from a satellite phone, automated ocean current sensor data, and Synthetic Aperture Radar and high-resolution satellite images—and has been. Likewise, records of the genocidal war against indigenous people and the destruction of their mountain environments in Guatemala over three and half decades, assaults by Israeli soldiers against unarmed protestors in the village of Bil'in in April 2009, and attacks by American drones against targets in Pakistan between 2010 and 2012 have all been captured by a variety of sensors—from high-resolution imaging satellites to mobile phone videos—and redeployed as evidence in a range of human rights investigations produced within the Forensic Architecture project and represented here in *Forensis*.[30]

But beyond this militant transformation of high-tech and often state-sponsored evidence into material for human rights claims, each of these projects, in different ways, also testifies to a remarkable feature of the contemporary experimental forensics represented here: a commitment to what my colleague Oraib Toukan once called, in another seminar, "staging the truth."

The Human Rights Project at Bard College and the Centre for Research Architecture at Goldsmiths had convened a workshop at Bard on forensic evidence, in February 2011, and invited Human Rights Watch investigator Fred Abrahams, Harvard architectural historian and ICTY expert witness Andras Riedlmayer, and Stefan Schmitt, director of the International Forensics Program at Physicians for Human Rights and former leader of the Guatemalan Forensic Anthropology Foundation. As Schmitt explained his protocols for exhuming mass graves, and just as importantly, for photographing that process, he referred regularly to the importance of producing evidence that required as little explanation in court as possible. "If things talk for themselves," he said, "you don't have to say anything." Evidence, he reminded us, is simply "what is submitted to a tribunal as a means to ascertain the truth of an alleged matter of fact—and that determines how I collect it." The bones need to be exhumed, yes, but the scenes need to be prepared and documented carefully, following rules and protocols that are produced in order to generate the maximum transparency: "You never know what this is going to be important for ten years from now."[31]

Fig. 14. What Stefan Schmitt calls "conditional evidence": the photograph shows that "this individual's hands were tied behind their back—a fact that will be 'lost' once the remains have been exhumed." From a May 1994 exhumation in Las Vueltas de la Calera, Honduras, conducted jointly by Physicians for Human Rights (William Haglund and Clyde Snow) and the Guatemalan Forensic Anthropology Team (Equipo de Antropología Forense de Guatemala). Photo: Stefan Schmitt.



To which Toukan asked, or rather proposed, "So you're, effectively, staging the truth."

"Staging," of course, when said in a certain tone, could constitute a serious indictment of the investigative process, as when we charge a photographer with

having staged a picture. But Schmitt understood the proposition differently, as a translation of just what he had been saying: yes, the scene, the stage, needs to be prepared, made camera-ready, as it were, so that the truth of the matter has a chance of appearing later, maybe much later, in forums the existence of which we do not yet even suspect. And a great deal of work goes into preparing that stage.

This non-naive commitment to a notion of the truth might seem surprising, but I think it informs much of the work in *Forensis*. A rich notion of forensics implies that things happen, traces are left behind, and disputes ensue about the meaning of those traces, what it is exactly that they testify to. Because there is an imprint, there is the possibility for interpretation and hence for disagreement—this conflictual battleground of readings does not take place because there is no truth, but rather because there is.

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In the final scene of *Witnesses from the Grave*, Eric Stover and Christopher Joyce's account of the career of Clyde Snow and the birth of the Argentine forensic team, Snow and three members of the team are taking a break from exhuming a mass grave.

It has been raining and they cannot dig, so they have retreated to the countryside. They sit by the edge of a stream. Snow reads a book, and his "companions watch leaves and small branches collect in an eddy near his feet." They exchange stories about their dreams, a pastime which, the authors tell us, is "something they do when the mood strikes." These are not their hopes and dreams for the future, but rather what they have been dreaming at night. And they dream about bones:

> Luis [Fondebrider] describes his latest. He is sitting in a cafe in the Florida district with a beautiful woman beside him. He leans forward to kiss her. But just before their lips meet, she turns into a skeleton.[32]

Most of the dreams recounted by the newly trained forensic team share this strange temporal dynamic. Time accelerates, the passage through life goes too quickly, disappears in an instant, and the face is replaced by a skull. Even when we are alive, we are just waiting to be revealed as the skeletons we inevitably are. The young Argentines who have been spending most of their days in the dirt with bones seem to have developed a strong sense of our collective destiny.

But perhaps this story should be told in reverse, the movie rewound: the dreamer here knows only the skeleton, and reanimates it—that is his work, in a sense—just long enough to imagine a more intimate relation to it. The bodies they are exhuming, after all, are those of strangers, people with whom the members of the team have no connection other than a sense that they deserve some sort of justice or accounting. So the reanimation that is this forensic work lasts long enough to make it clear that if the bones do come to life, in some sense, if they become active in the present, they nevertheless do not come back to their former lives—they remain bones, even as they move, kiss, dance, have stories to tell. Life is restored, or granted, but to the bones as such, not to the bodies they once structured. They look like skeletons, but they act like ghosts, spectral or hallucinatory remnants of a past that cannot be undone or restored but which can still have effects. The work of the team fosters this hallucination, in the best sense; perhaps that is why they like to talk about their dreams.

Snow, who has been reading, does not contribute a dream to the conversations but simply tells a joke, and as they laugh, the book ends this way:

> The sun, as if cued by their laughter, breaks through the cloudy El Tigre sky. Shivering, Pato [Patricia Bernardi] pulls her shawl over her shoulders. "How can the sun make you cold?" Luis asks, wrapping his arm around her. "Because it means we'll be digging again." Snow looks up from his page. With a willow branch, he leans over the swirling knot of debris near his feet and pushes it free. They watch as it slowly floats downstream, out of sight, toward the sea.[33]

The allegory is clear enough. The younger members of the new team, driven by a passion to clarify the past and see some sort of justice done, live an oscillation of de- and re-animation. They dream, awake and in sleep, of the possibility that the dead might speak and of the certainty that our animated, speaking existence here today is only a temporary condition. They are living in the graves, still digging even when they sleep. Even the sun only promises a renewed encounter with this task; indeed, the emergence of the sun *means* that the bones will once again be revealed and start speaking. The narrative endorses their determination to make the past speak to the present, their pursuit of another kind of evidence that will join the eyewitness testimony and the documents in future trials.

Snow shares this knowledge—he has taught it to them—and he has seen and done enough to know that a slightly different gesture is also required, another sort of relation to what comes to us from the past, to the pieces and parts of the past that accumulate in knots of debris over time. He pushes it free, and lets it float out of sight. Rather than returning, it disappears.



Fig. 15. Clyde Snow with members of the Argentine Forensic Anthropology Team, outside their office in Buenos Aires, 1988. From left: Dario Olmo, Alejandro Inchaurregui, Patricia Bernardi, Snow, Mercedes Doretti, and Luis Fondebrider. Photo: Eric Stover.

She thinks of digging again, he liberates the flotsam. Is this the same project? The narrative, although it gives the last move to Snow, does not, I think, choose between them. The rain is the enemy; that much is clear. But the sun, at once the condition of possibility of their work and the emblem of its activist enlightenment

sensibility, the figurative agent of the voice of the dead ("almost as soon as the sun touched them, the bones started telling their stories") sheds an ambivalent light. It allows the dead to appear, maybe to reappear to the living, but it confirms them as dead and bleaches away any fantasy of redemption or nostalgia.

"How can the sun make you cold?" is not a rhetorical question, or a poetic lament. It is the melancholic testament to the ineradicable fact of *ruin* as a forensic condition, and it helps us understand something important about evidence and human rights.

Forensics, which is among other things constituted by the direct encounter with the stubborn fact of the past, with the past as debris, sometimes forgets this very fact. Sometimes, just as stubbornly as the thing resists, the researcher struggles to make it present, to bring it out of its decay and irrelevance and allow it to belong to us, here and now, securely. This is registered in the triumphal narratives of forensic success, of truth and identity ascertained, of the bones that "never lie and never forget," as Snow famously says.[34]

But the past cannot simply be made present, no matter how good the experts are at digging or at interpreting. It can be made wholly present just as little as it can be remain fully past. The confident stories of forensic certainty are an attempt to hide from this, to keep the remains settled in one place or the other: definitively anchored in a bygone past, and telling the truth in our present. The relics to which forensics responds are neither simply past nor present, in fact. In different ways, the stories told by the gravediggers on the riverbank testify to this. The sun makes them cold because it sends them back into the grave with bones that demand to be spoken of, with remains that want to have their say in another's voice, because although they are certainly dead they are just as certainly not gone. But the debris needs to be let loose as well as recovered; it does not belong to those who exhume it and through whom it bears witness, but instead resists appropriation—as well as forgetting. Rather than being possessed, what is left to be found can come to posses its interpreters, to demand of them that they speak and tell what happened. The ones who go into the graves know, better than anyone else, that nothing guarantees that the past is past, nothing secures it in the present, nothing prevents it from coming back, and going back. They know that afterlives are always possible, and hence that there is always evidence to be found, stories to be told, struggles to be waged, claims to be made.

1 Cited in Rachael Post, "Clyde Snow, with Mercedes Doretti and Fredy Peccerilli, 'When the Bones Speak Out,' November 17, 2000," Center for Latin American Studies, University of California, Berkeley, http://ias7.berkeley.edu/Events/fall2000/11-17-00-snow/index.html, last accessed December 2013.

2 Jacques Derrida and Bernard Stiegler, *Echographies of Television: Filmed Interviews*, trans. Jennifer Bajorek (London: Polity Press, 2002), 1–27 and 82–99; Okwui Enwezor, "Documentary/Vérité: Bio-politics, Human Rights, and the Figure of 'Truth' in Contemporary Art," in *The Green Room: Reconsidering the Documentary and Contemporary Art # 1*, eds. Maria Lind and Hito Steyerl (Berlin: Sternberg Press, 2008), 62–102.

3 Gilles Peress and Eric Stover, *The Graves: Srebrenica and Vukovar* (Zurich: Scalo Press, 1998); WITNESS/EAAF, dir., *Following Antigone: Forensic Anthropology and Human Rights Investigations* (USA, 2002), 40 min.

4 James C. McKinley, Jr., "From a Grave in Rwanda, Hundreds of Dead Tell Their Tale," *New York Times*, February 16, 1996.

5 See Paul de Man, "Autobiography as De-Facement," in *The Rhetoric of Romanticism* (New York: Columbia University Press, 1984), 67–81, particularly the reading of Wordsworth's phrase "the sun looks down upon the [grave] stone," in which de Man sees "the speaking stone counterbalancing the seeing sun," thus linking the grave and the sun through the figure of *prosopopoeia*: "The fiction of an apostrophe to an absent, deceased, or voiceless entity, which posits the possibility of the latter's reply and confers upon it the power of speech. Voice assumes mouth, eye, and finally face, a chain that is manifest in the etymology of the trope's name, *prosopon poien*, to confer a mask or a face (*prosopon*)" (75–76).

6 Quoted in National Library of Medicine, "Visible Proofs: Forensic Views of the Body," exhibition website, http://www.nlm.nih.gov/visibleproofs/galleries/cases/disappeared.html, last accessed December 2013.

7 Thomas Keenan and Eyal Weizman, *Mengele's Skull: The Advent of a Forensic Aesthetics* (Berlin: Sternberg Press, 2012).

8 CONADEP had been encouraged to contact the AAAS after an appeal from the Grandmothers of the Plaza de Mayo and Center for Social and Legal Studies. On the founding of the Argentine Forensic Anthropology Team (EAAF), see Don Stewart, "Witness after Death," *Sooner Magazine* (Fall–Winter 1985): 4–11; Michelle Green, "Dr. Clyde Snow Helps Victims of Argentina's 'Dirty War' Bear Witness from the Grave," *People*, December 8, 1986, 111; Stephen G. Michaud, "Identifying Argentina's Disappeared," *New York Times Magazine*, December 27, 1987, 18; Christopher Joyce and Eric Stover, *Witnesses from the Grave: The Stories Bones Tell* (Boston: Little, Brown and Company, 1991), 215–49; "The Founding of EAAF," Argentine Forensic Anthropology Team, *2007 Annual Report* (Buenos Aires, 2007), 3.

9 Keenan and Weizman, *Mengele's Skull*, 20.

10 Adam Hochschild, *Bury the Chains* (Boston: Houghton Mifflin, 2005), 155.

11 Ibid.

12 Ibid., 197.

13 Ibid., 198.

14 Ibid., 156.

15 Ibid., 198.

16 Ibid., 128.

17 Hannah Arendt, *The Origins of Totalitarianism* (New York: Harcourt Brace Jovanovich, 1951), 298.

18 Office of the United States Attorneys, *United States Attorneys' Manual* (1997), Title 4: Civil Division, citing *Eighth Circuit Model Instruction No. 3.02 and 3.03* (1992), http://www.justice.gov/usao/eousa/foia_reading_room/usam/title4/civ00024.htm. The bracketed words can be added by the judge if there is, in the given case, "stipulated" evidence.

19 Office of the United States Attorneys, *Justice 101*, Legal Terms Glossary, "evidence," http://www.justice.gov/usao/justice101/glossary.html, last accessed December 2013.

20 Ed Vulliamy, *Amexica: War along the Borderline*, revised and updated edition (New York: Farrar, Straus and Giroux/Picador, 2011). For a graphically illustrated account of the violence, see *Dying for the Truth: Undercover Inside the Mexican Drug War by the Fugitive Reporters of Blog Del Narco* (Port Townsend, WA: Feral House, 2012).

21 Vulliamy, *Amexica*, 51.

22 Ibid., 342.

23 Ibid., 53.

24 Ibid., 54.

25 Ibid., 341.

26 Ibid., 188–89.

27 J. David Goodman, "X-Ray Scan Reveals 513 Migrants in 2 Trucks," *The Lede, New York Times* online, May 18, 2011, http://thelede.blogs.nytimes.com/. See also Associated Press, "513 U.S.-Bound Migrants Are Found on 2 Trucks in Mexico," *New York Times*, May 17, 2011; Susana Seijas, "Human smuggling exposed by truck x-ray," *CBS News World Watch*, May 18, 2011, http://www.cbsnews.com/news/human-smuggling-exposed-by-truck-x-ray/.

28 The graves of others who had not survived the crossing were not far off. CBS producer Susana Seijas reported that in the weeks prior to this event came "the discovery of mass graves in San Fernando, Tamaulipas (just 90 kms from Brownsville, Texas) where authorities found more than 183 decomposing bodies, many of whom were suspected migrants. There was a further discovery of 218 bodies in shallow graves in Durango state." Seijas, "Human smuggling exposed."

29 See the extensive documentation by the Forensic Oceanography team at http://www.forensic-architecture.org/investigations/forensic-oceanography/.

30 See the documentation for the following investigations carried out by Forensic Architecture and collaborators in the present volume: "Case: Guatemala," "Case: Bil'in," and "Case: Drone Strikes."Detailed documentation of these investigations can be seen at http://www.forensic-architecture.org/investigations/.

31 Author's notes, February 4, 2011; see the program at http://www.forensic-architecture.org/seminars/forensic-evidence/.

32 Stover and Joyce, *Witnesses from the Grave*, 304–05.

33 Ibid., 305.

34 Ibid., 144.

Can the Sun Lie?

Susan Schuppli



Fig. 1. Sunset on the Labrador Coast. Glass photographic slide. Collection of the author.

"Can the sun lie?" asked the Albany Law Journal in 1886. "Perhaps we may say that though the sun does not lie, the liar may use the sun as a tool. Let us, then, beware of that liar who lies in the name of the sun."[1]

"Sun-pictures," or photographs as they would come to be called, transformed the courtrooms of the late nineteenth century. For the first time evidence was entered into legal proceedings that had been produced by a nonhuman agent; one whose motivations could not be judged, and whose actions could not be tried for perjury.[2] Could the streaming radiance of the sun, in registering the traces of an external event, manipulate the natural order of things and transform stable realties into spectral images that emerged out of the collusion of chemistry and light? Or was the sun a mere conspirator in the fabrication of a photographic reality that was ultimately ordered by man?

> Photographs ought to be seldom received except in conjunction with the personal evidence of the photographer who took them, and when there is satisfactory independent evidence that the photographs are truth-speaking witnesses.[3]

The legally sanctified gaze of the human had a rival in the advent of new photographic technology, which deeply troubled the courts. While photographs taken in the aftermath of a crime or for the purposes of explication had previously been presented in court as a visual aid to testimony, now they were entering the legal process as demonstrative evidence in their own right. If evidence could be deliberately manufactured after the fact then the self-evident facts of the case could themselves be thrown into doubt. The introduction of these photographic materials into legal trials inaugurated a radical transformation in evidence law as the sovereignty of the human eyewitness was called into question by new modes of technical witnessing, contributing to what has been referred to as an episteme of mechanical objectivity.[4] While *things* such as models and diagrams had already entered into legal proceedings in cases of patent law or to assist with clarifying property disputes, the entrance of photographic materials was understood as singularly unique because of sunlight's persuasive power of analogization.[5] Its radiological emissions produced such convincing pictures of the real that the subjective processes of human recollection and memory could, it seemed, be set aside in favor of a new regime of scientifically induced "truth." Indeed, proponents of the legal aid provided by sunlight were swift to dismiss any doubts as to its fidelity and countered these reservations with statements such as the following:



Fig. 2. Film still, Zacharias Kunuk and Ian Mauro, dirs., *Inuit Knowledge and Climate Change* (Canada, 2010), 54 min. Courtesy of ISUMA TV.

> We cannot conceive of a more impartial and truthful witness than the sun, as its light stamps and seals the similitude of the wound on the photograph put before the jury; it would be more accurate than the memory of witnesses, and as the object of all is to show truth, why should not this dumb witness show it?[6]

In this latter citation, the sun is figured as a transcendent light that bestows upon the photograph the authoritative stamp and seal of a higher order of truth—namely that of nature. Human observations could be subjectively tainted whereas the photographic memory captured by the direct intercession of sunlight created visible proofs that no jurist could dispute. The term "sun-pictures" was coined in 1845 by Henry Fox Talbot to describe his photogenic drawings of nature: "The plates of the present work are impressed by the agency of Light alone, without any aid whatever from the artist's pencil. They are the sun-pictures themselves, and not, as some persons have imagined, engravings in imitation."[7] Seeing was no longer the inviolable scopic means by which truth-to-nature could be achieved. Sun-pictures were as close to a representation of the real as one could get. Admittedly the forces of nature could be harnessed and used by humans, but nature as pure radiant energy was not of the realm of man and therefore was deemed to be without intent to harm and incapable of duplicitous action. Whereas in posing the question "Can the sun lie?" the court acknowledged that what was at stake was not so much the possibility that the sun could intervene and shape what is seen and how we see it, but rather that its radiant optics could be used to author a false narrative. So who then was the true witness? The human who understood not wholly what they had seen, whose eyes might have been mistaken? Or the photonic radiance of the sun whose rays cast a shadowy mirage onto panes of paper and glass but whose technical exertions were subject to the vagaries of chemistry and darkroom procedures?

The nineteenth-century court was thus both perturbed and excited by the arrival of evidentiary materials of exact recording that were derived from processes deemed to be outside the direct sphere of human intervention. The concerns around the legal use of photography were further exacerbated by the advent of the expert: "as photographic technology advanced [into the twentieth century] and the recognition of the manipulation involved in the production of the photographic work increased, scepticism as to its evidentiary value grew stronger. The legal profession's increasing reliance on expert testimony also tarnished the photograph's reputation for incontrovertibility, for as its use became more common, photographic experts began to face each other across the courtroom."[8] The arrival of the expert in court thus signals another shift in the contretemps around truth-to-nature as the human eyewitness's ability to account convincingly for the event and the photograph's technical capacity to record it were now both thrown into doubt, subjected to a new order of certainty produced by the domain of expertise. Nor have these historically controversial issues around the objectivity of photography, the testimony of nonhuman agents, and the opposition between lay and scientific knowledge gone away with the introduction of the digital and the development of an ever increasing range of technologies for measuring and recording the natural world. Indeed, the very lack of agreed-upon protocols governing the use of these new technologies and absence of consensus as to the interpretation of their data sets have if anything reanimated such debates. This is particularly evident within the context of climate change debates and especially so with regards to interaction between the different regimes of witnessing represented by scientific expertise and indigenous storytelling traditions. Historically considered a denigrated mode of knowledge transfer, indigenous observations and their oral transmissions are forcefully reshaping the epistemic frameworks that are required for understanding long-term environmental transformations. A reordering of expertise and its proprietary claims on truth that turn on the evidence proffered by nature itself.





Fig. 3 a, b. Film stills, Zacharias Kunuk and Ian Mauro, dirs., *Inuit Knowledge and Climate Change* (Canada, 2010), 54 min. Courtesy of ISUMA TV.



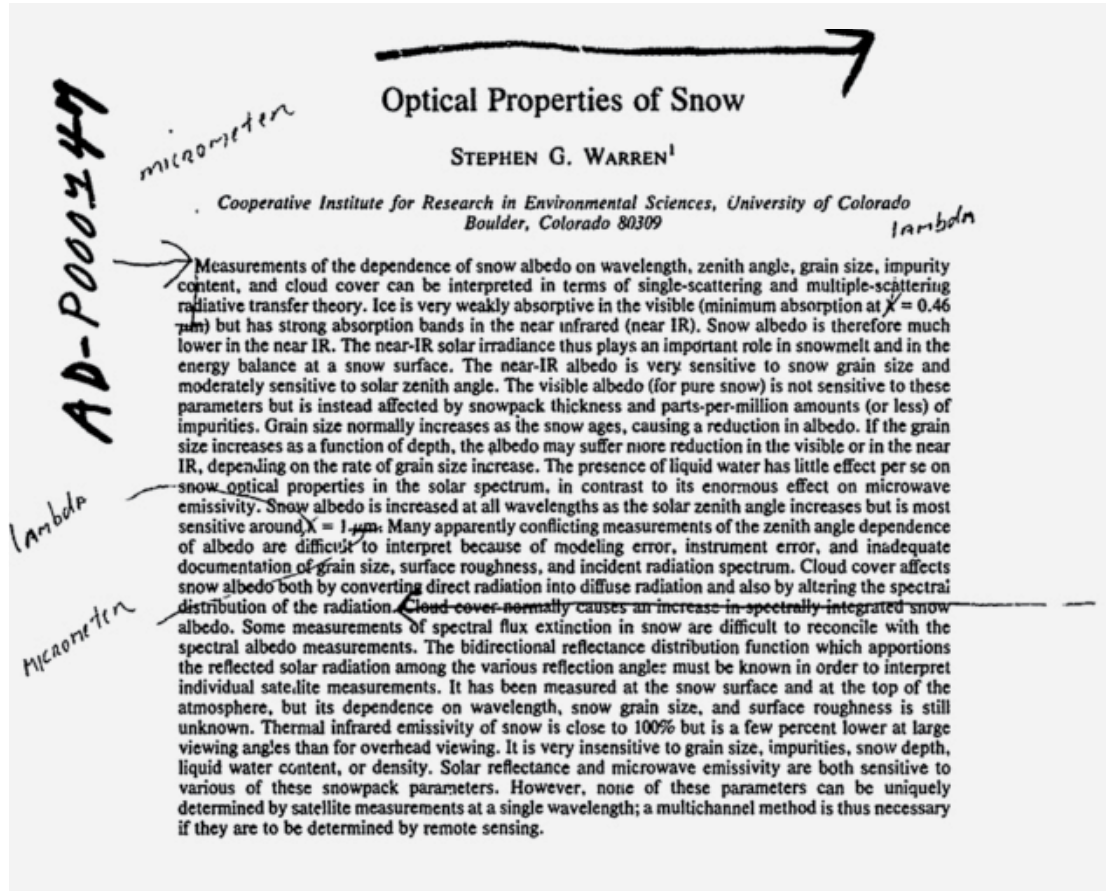
Fig. 4. Film still, Zacharias Kunuk and Ian Mauro, dirs., *Inuit Knowledge and Climate Change* (Canada, 2010), 54 min. Permission of ISUMA TV.

Disputed Sunset

Over the years, nobody has ever listened to these people. Every time [the discussion is] about global warming, about the Arctic warming, it's scientists that go up there and do their work. And policy makers depend on these findings. Nobody ever really understands the people up there.
— Zacharias Kunuk[9]

In the Canadian Arctic the sun is setting many kilometers further west along the horizon and the stars are no longer where they should be. Something is happening. Sunlight is behaving differently in this part of the world as the warming Arctic air causes temperature inversions and throws the setting sun off kilter. Light is bending and deceiving eyes that have tracked the position of the sun for generations, using it as an index of place and a marker for direction. The crystalline structures of ice and snow are twisting and morphing, producing a new optical regime borne out of climate change and indigenous observations. The sun has finally become a liar, colluding with the melting topographies of the North, so much so that it can no longer be trusted to guide the Inuit hunters home as it once did.

The nineteenth-century suspicion directed toward the sun's capacity to mislead, to turn stable realities into distorted versions of the real, is refracted in this twenty-first-century corollary as climate change transforms the surfaces of the earth into a vast array of quasi-photographic plates, each of which is recording the atmospheric chemistry of terrestrial change differently. For the Inuit, the world that they once knew finds no analogy, no mirror image, in the world that they now see.



Optical Properties of Snow

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Measurements of the dependence of snow albedo on wavelength, zenith angle, grain size, impurity content, and cloud cover can be interpreted in terms of single-scattering and multiple-scattering radiative transfer theory. Ice is very weakly absorptive in the visible (minimum absorption at $\lambda = 0.46$ μm) but has strong absorption bands in the near infrared (near IR). Snow albedo is therefore much lower in the near IR. The near-IR solar irradiance thus plays an important role in snowmelt and in the energy balance at a snow surface. The near-IR albedo is very sensitive to snow grain size and moderately sensitive to solar zenith angle. The visible albedo (for pure snow) is not sensitive to these parameters but is instead affected by snowpack thickness and parts-per-million amounts (or less) of impurities. Grain size normally increases as the snow ages, causing a reduction in albedo. If the grain size increases as a function of depth, the albedo may suffer more reduction in the visible or in the near IR, depending on the rate of grain size increase. The presence of liquid water has little effect per se on snow optical properties in the solar spectrum, in contrast to its enormous effect on microwave emissivity. Snow albedo is increased at all wavelengths as the solar zenith angle increases but is most sensitive around $\lambda = 1$ μm. Many apparently conflicting measurements of the zenith angle dependence of albedo are difficult to interpret because of modeling error, instrument error, and inadequate documentation of grain size, surface roughness, and incident radiation spectrum. Cloud cover affects snow albedo both by converting direct radiation into diffuse radiation and also by altering the spectral distribution of the radiation. Cloud cover normally causes an increase in spectrally integrated snow albedo. Some measurements of spectral flux extinction in snow are difficult to reconcile with the spectral albedo measurements. The bidirectional reflectance distribution function which apportions the reflected solar radiation among the various reflection angles must be known in order to interpret individual satellite measurements. It has been measured at the snow surface and at the top of the atmosphere, but its dependence on wavelength, snow grain size, and surface roughness is still unknown. Thermal infrared emissivity of snow is close to 100% but is a few percent lower at large viewing angles than for overhead viewing. It is very insensitive to grain size, impurities, snow depth, liquid water content, or density. Solar reflectance and microwave emissivity are both sensitive to various of these snowpack parameters. However, none of these parameters can be uniquely determined by satellite measurements at a single wavelength; a multichannel method is thus necessary if they are to be determined by remote sensing.

Fig. 6. (above) Found image with supplementary inscriptions suggestive of how knowledge is always a process of intervention and accretion.

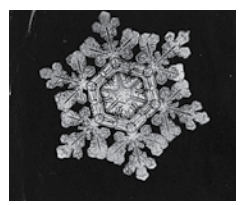


Fig. 6. (right) Photograph of snowflake, Wilson A Bentley, 1885.

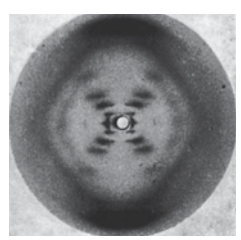


Fig. 7. (right) Rosalind Franklin's celebrated Photo 51, which singularly contributed to Watson and Crick's understanding the double-helix structure of DNA. Photograph © Franklin, R. and Gosling. R.G./*Nature.*

In the far North this process of inscription has accelerated at between two and four times the global average and intensified as tropospheric warming and temperature inversions trap ever greater concentrations of atmospheric pollutants within particles of ice and snow, whereas previously they would have been diffused at higher altitudes. Snow and ice absorb and refract light differently. The visible spectrum of light that one can see is better refracted by snow, whereas the optical properties of ice have superior absorption capacities towards the spectrum of the near infrared.[10] This is why, in part, indigenous observations of the changing pathway of the sun are made in regions covered by continuous snow. The reflectance properties of snow are governed by individual grain size, impurities, liquid water content, surface roughness, and by the depth and density of the pack. At the macroscale, cloud cover and atmospheric pollutants also combine to alter the spectral distribution of radiation. The material registration of light by silver halide particles that came to define the photographic process is warped in a landscape where matter is out of place and sunlight lies.

Snow is fundamentally photographic. Its capacity to both be affected by and register the behavior of sunlight positions it as analogic to the wetware

processes of the nineteenth century, in which the image capture of nature held primacy. In 1885, Wilson A. Bentley, a self-taught scientist, became the first person to photograph a single, unique snow crystal by outfitting a microscope with a bellows camera.[11] During his lifetime Bentley captured over five thousand images of snowflakes and contributed to the emergence of the field of crystal photomicrography, which would ultimately have enormous significance for the work of British X-ray crystallographer Rosalind Franklin and the discovery of the structure of DNA, the so-called blueprint for all organic life.[12] Crystallography is still an important tool for ice scientists, although the thoroughness of Bentley's work meant that new images of snow crystals were not produced for another 100 years. Not only do granular snow particles absorb and capture light, converting billions and billions of grains into a vibrating photographic plate of solar-charged particles, they also act as vast networks of finely ground crystal lenses focusing and refracting light across the polar regions. Moreover, as chemical impurities increasingly saturate the snow and temperature increases reshape the density of the snow pack and liquefy its crystalline structure, the snow also becomes a developing solution, overexposing and distorting the image of nature inscribed into land and refracted back through the atmosphere. Snow is camera lens and photographic substrate, refractive technology, and specular image. The blindness caused by snow, in reflecting ultraviolet radiation, is already a sign of the intrinsic interplay between sunlight, snow, and human vision; an entanglement that will come to signal the anthropogenic violence that now reorganizes the solar spectrum and Inuit observations under the experimental conditions of global warming.

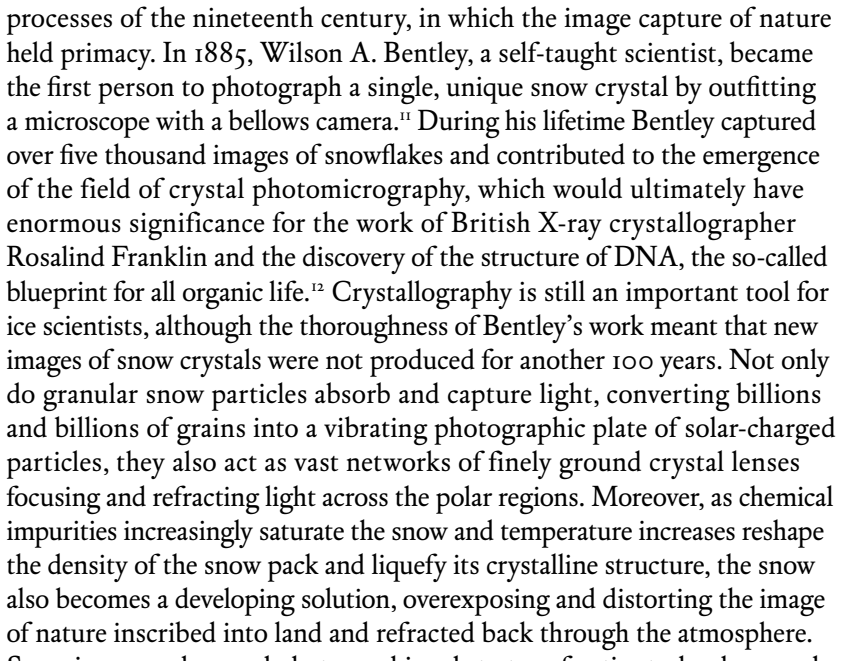


Fig. 8. (left) COP15 Plenary Session. Courtesy of Ministry of Foreign Affairs of Denmark, 2009.

Fig. 9. (below) COP15 Logo designed by NR2154. Courtesy of Ministry of Foreign Affairs of Denmark, 2009.

COP15
COPENHAGEN

Fig. 10 a–d. (right) Film stills, Zacharias Kunuk and Ian Mauro, dirs., I*nuit Knowledge and Climate Change* (Canada, 2010), 54 min. Courtesy of ISUMA TV.



Fig. 11. (below) Film still, Zacharias Kunuk and Ian Mauro, dirs., *Inuit Knowledge and Climate Change* (Canada, 2010), 54 min. Courtesy of ISUMA TV.

In Zacharias Kunuk and Ian Mauro's film *Inuit Knowledge and Climate Change* (2010) several Inuit elders make the repeated observation that the setting sun has slowly been moving further west and that the location of the stars has also altered. "Has the earth shifted on its axis, they ask, causing the position of the sun and stars to change?"[13]

When the film was prescreened at the Copenhagen Climate Change Conference (COP15) in December 2009 it was met with a hostile reaction from the scientific community. "We had a litany of scientists come back to us, responding after seeing this news, saying, this was great to be speaking to indigenous people about their views, but if you continue to perpetuate this fallacy that the Earth had tilted on its axis, [the Inuit] would lose all credibility."[14] In short, the Inuit's deep ancestral knowledge of the environment in which they lived and the events that they had witnessed was insufficient for conferring a contingent legitimacy on their speech acts if their testimonials ran counter to widely accepted scientific truths.

The epistemic virtue of objectivity so valued by the scientific community at COP15 turned, it would appear, not on a distinction between Western rationality and native cosmology, as might be expected, but on the question of who has the authority and thus expertise to speak on behalf of science itself. The point was that the Inuit may have come to the wrong scientific conclusion based on their limited knowledge about how polarized light refraction works, but their observations were not in and of themselves flawed—their eyes had not deceived them. If anything, the duplicitous agent was one induced by southern reliance on hydrocarbon-based energy. A new sun had indeed risen at the global forum in Copenhagen, its ferocious heat set ablaze



by the relentless burning of fossil fuels in cities and factories far removed from their zones of maximum impact in the Arctic. It is this sun that the Inuit observe and now cross-examine. Climate change denial finds its allies in just such disputed sunsets and therefore it comes as no surprise that the scientists at COP15 were apprehensive about the seemingly hallucinatory narratives invoked by Inuit elders in Kunuk and Mauro's film. Yet had they paid greater attention to these stories as paradigmatic of the extreme changes that were taking place in the Arctic, and recognized that only a radical proposition might begin to explain what was going on, they would have subverted the counternarrative of the false witness in which Inuit vision was deemed fallacious and therefore open to dismissal.

The most dangerous perjurer is said to be the one who lies with the full conviction of truth. Let us, then, beware of the liar who lies in the name of the new sun.

1 "The Photograph as False Witness," *Albany Law Journal*, no. 457 (December 4, 1886).
2 I am referring specifically to trials that took place within American courts. See also Jennifer L. Mnookin, "The Image of Truth: Photographic Evidence and the Power of Analogy," *Yale Journal of Law & the Humanities*, vol. 10 (1998): 1–74.
3 "The Photograph as False Witness," 34, quoted in Thomas Thurston, "Hearsay of the Sun: Photography, Identity, and the Law of Evidence in Nineteenth Century American Courts," *American Quarterly: Hypertext Scholarship in American Studies*, http://chnm.gmu.edu/aq/photos/index.htm, accessed March 29, 2013.
4 See Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone, 2007).
5 See Alain Pottage, "Law Machines: Scale Models, Forensic Materiality and the Making of Modern Patent Law," *Social Studies of Science* 41, no. 5 (2011): 621–43.
6 *Franklin v The State of Georgia*, 69 Ga. 36 (1882).
7 William Henry Fox Talbot, *Sun Pictures in Scotland* (London, 1845). See also the reference to Talbot's *Pencil of Nature* in Daston and Galison, *Objectivity*, 130.
8 Thurston, "Hearsay of the Sun."
9 Guy Dixon, "New documentary recounts bizarre climate changes seen by Inuit elders," *The Globe and Mail*, October 19, 2010.
10 Stephen G. Warren, "Optical Properties of Snow," *Reviews of Geophysics and Space Physics* vol. 20, no. 1 (1982), 67–89. See also Thomas C. Grenfell and Garry A. Maykut, "The Optical Properties of Ice and Snow in the Arctic Basin," *Journal of Glaciology*, vol. 18, no. 80 (1977): 445–63; and Holly J. Reay, "Optical Properties of Snow and Sea-Ice – A Field and Modelling Study," Department of Earth Sciences (unpublished PhD thesis, Royal Holloway College, University of London, 2013).
11 Bentley tended to idealize his images by placing snow crystals on monochromatic black backgrounds (outside of their natural realm) and trimming the edges of errant flakes, a practice harshly criticized by his German counterpart Richard Neuhauss.
12 Franklin's images of X-ray diffraction, especially "Photo 51," were crucial in establishing the double-helix structure of DNA. This photograph was shown to Watson when he toured her lab without her approval or even knowledge. The image and her accurate interpretation of the data provided Watson and Crick with the insight they needed to model DNA and resulted in their winning the Nobel Prize. Franklin's key role in this discovery remained unacknowledged during her lifetime. See Katherine Nightingale, "Behind the Picture: Photo 51," April 25, 2013, http://www.insight.mrc.ac.uk/2013/04/25/behind-the-picture-photo-51/
13 Zacharias Kunuk and Ian Mauro, directors, *Inuit Knowledge and Climate Change* (Canada, 2010), 54 min.
14 Dixon, "New documentary recounts bizarre climate changes seen by Inuit elders."

Aural Contract: Forensic Listening and the Reorganization of the Speaking Subject

Lawrence Abu Hamdan

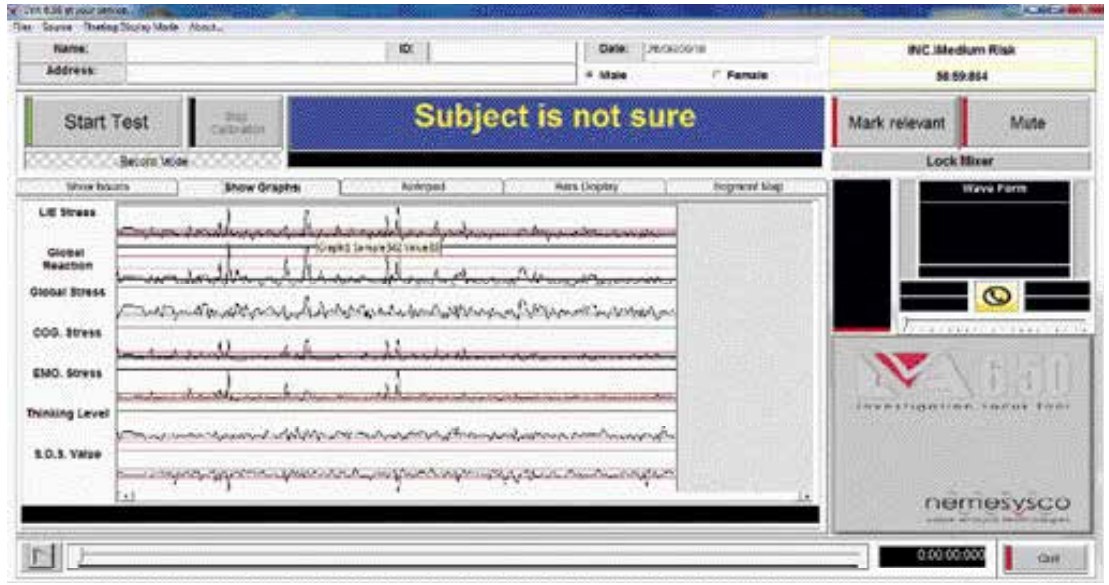


Fig. 1. "Subject is not sure." Screenshot from Layered Voice Analysis 6.50 which examines micro fluctuations of voices to corroborate what the subject is saying. Source: www.LVA650.com

In an article titled "Mengele's Skull," Thomas Keenan and Eyal Weizman suggest that in the mid-eighties international justice entered a new era. The authors claim that unlike the seminal 1961 trial in Jerusalem of Adolf Eichmann, which was archetypal of an era defined by eyewitness testimony, in the mid-eighties international justice became a stage for a different type of narrative; "a second narrative, not the story of the witness but that of the thing in the context of war crimes investigation and human rights."[1] The authors claim that what catalyzed this new era into existence was the exhumed remains of the German SS officer and Nazi physician Joseph Mengele.

One year before the forensic examination of Mengele's remains, a piece of legislation was passed in British criminal law which unknowingly also marked a crucial and forensic shift in the conventions of testimony. The 1984 Police and Criminal Evidence Act (PACE) ordered all police interview rooms to be equipped with audio recording machines, so that all interrogations from then on would be audio-recorded instead of transcribed into text. The passing of this law unintentionally catalyzed the birth of a radical form of listening that would over the next twenty-eight years transform the speaking

subject in the process of law. This legislation fundamentally stretched the role of the juridical ear from simply hearing words spoken aloud to actively listening to the process of speaking, as a new form of forensic evidence. This essay is dedicated to understanding the type of listening that this moment in 1984 inaugurated; I seek to amplify both its origins and its role in the contemporary juridical and political forums, in which we see the fragile balance of fundamental human and civil rights predicated on listening and the voice, tipping into an uncertain future which calls into question the very means through which we can negotiate politics and the law.

Nineteen Eighty-Four

Code E of PACE was seen as a solution to claims that the police were falsifying confessions and altering statements made during interviews, as prior to this point all statements were simply written down "verbatim" by the police officers and then signed off on by the suspect. Were it not for a handful of linguists practicing a rare strand of forensic phonetic analysis, PACE would have remained a simple and transparent article of legal reform. Instead, the act exponentially increased the use of speaker profiling, voice identification, and voice prints in order to, among other things, determine regional and ethnic identity as well as to facilitate so-called voice lineups.

Prior to PACE, if it was suspected that someone's voice was on an incriminating recording—for example a bugged telephone conversation in which there was discussion of an illicit act, or a CCTV surveillance tape of a masked bank robber shouting "Hand over the money"—that person was asked to come to the police station and give a voluntary voice sample. After PACE, doing so was no longer voluntary, and all such recordings were added to a growing audio archive of cassette tapes. This archive quickly became accessed by the little known scientific field of forensic linguistics; this unexpected convergence thereby added the voice as a new medium through which to conduct legal investigations. Soon the forensic listener was required not only to identify voices, but to investigate background sounds in order to determine where, with what machine, and at what time of day a recording had been made—thus enabling a wide range of sonic frequencies to testify.

Legislation similar to PACE was adopted by many other countries in the mid-1980s, resulting in the permanent installation of audio recording machines in police interview rooms around the world. As in Britain, these policies resulted in the establishment of independent forensic audio labs, and today there are even postgraduate university programs devoted to the field.

Cassette recorders placed in all police interviews reorganize the voice as evidence and therefore PACE, as we will see throughout this essay, is for my research what Mengele's skull became for Keenan and Weizman, i.e., representative of an epistemic and technological shift that emerged in the mid-eighties and which gave rise to new forms of testimony based on the analysis of objects rather than witness accounts. Yet in the case of forensic listening there is a crucial difference: here there is no clean shift from witness account to the expert analysis of objects because the witness account and the object under investigation are the same thing. The voice is at once the means of testimony and the object of forensic analysis.

JP French Associates, the United Kingdom's most prominent independent forensic audio laboratory, has worked on over 5,000 cases since 1984. Its founder, Peter French, told me in reference to PACE that "whereas up to that point […] I had a trickle of work coming in, all of a sudden it was as though there had been a thunderstorm and it started raining cassette tapes."[2] However, this overnight transformation of the voice as a legal object of investigation must be seen in the greater context of the role of the voice in law at large. In other words, would this thunderstorm have happened if the voice was not already such a central part of legal negotiation and process? Moreover, it is this very fact of the voice as being central to the formation, mediation, and practice of the law that makes it such a complex article of evidence. It is my argument that the PACE legislation formalizes a regime of listening that was always present within law: that the initiation of audio recording machines in police interview rooms drew upon, brought to the surface, and professionalized a way of listening to the voice specific to political and legal forums.

Just Voices

For the law to acquire its performative might, it must be delegated to the voice. For the law to come into effect it must be announced and it must be heard. Writing alone is inadequate to carry out the burden of legislation, which must first be committed to speech. As a site where speech acts, the trial allows us to understand how the voice serves to activate certain forms of governance and control.

In the United States Supreme Court to this day there is a vocal tradition that I find quite revealing: when the clerk enters the courtroom at the beginning of the day he/she inaugurates the proceedings by striking the gavel onto the woodblock then waiting for silence, before announcing, "the Honorable, the Chief Justice, and the Associate Justices of the Supreme Court of the United States"—and then, for four seconds, he/she interrupts his/her own speech and sings out "OYEZ OYEZ OYEZ"—before returning to his/her declaration that the court is now sitting and that God is now blessing the honorable court. Then with a second strike of the gavel he/she sits down. In this situation, we see the means by which the law is vocally summoned into existence. A legal space is endowed with the right to carry out justice only when certain announcements are made. These announcements, in combination with other oaths and speech acts, function as a juridical amplifier, the switch that makes legally inaudible speech audible. These acts operate through

the voice in order to transform words from the normal conditions of communication to the extraordinary conditions of testimony. And yet something more than the speaking of words is found in the clerk's call. In those four seconds when his annunciation shifts from a prescribed set of spoken words to the ineffability of nonverbal sounds—"Oyez Oyez Oyez"—we see that it is not simply language that legislates but also the extra-linguistic elements of the voice itself.

The legal action *habeas corpus* offers us some insight into the use of the voice as both a verbal and a nonverbal instrument. This ancient writ, which translates to "may you have the body," stipulates that a person under arrest must be physically brought before a judge. The judge must see and hear the suspect live. The voice is a corporeal product that contains its own excess, with this corporeal excess announcing to the court the absolute presence of the witness. This bodily excess of the voice resides not in its linguistic functions, but in its nonverbal effects; such as its pitch, accent, glottal stops, intonations, inflections, and impediments. As byproducts of the event of language, these effects reveal other kinds of evidence, evidence that may evade the written documentation of legal proceedings but does not escape the ears of the judge and of those listening to a trial in the space of the courtroom.

These paralinguistic elements of testimony produce a division of the voice, which in turn establishes two witnesses within one voice: one witness speaks on behalf of language and the other on behalf of the body. Often the testimony provided by each of these two witnesses is corroborated by the other, but they can also betray one another—an internal betrayal between language and body, between subject and object, fiction and fact, truth and lie. This betrayal exists in a single human utterance in which the self gives itself away. This splitting of the voice into two selves, or into two witnesses, can also be seen as an extension of the well-established legal principle of *testis unis, testis nullus*, which translates to "one witness, no witness," and which means that testimony provided by any one person in court is to be disregarded unless corroborated by the testimony of at least one other. The law, it seems, requires a certain doubling of testimony, and this doubling even extends to the single witness. In the eyes of the law, the testimony of the single witness, whether the suspect or the survivor, has to be split into language and its bodily conduit for it to be considered testimony at all.

This doubling of testimony marks the terrain which was occupied by forensic linguists and acousticians within the field of law after 1984. In the cases of forensic listening that I will discuss here, we will see how these professional listeners became the expert witnesses speaking on behalf of the paralinguistic attributes of a person's testimony. After 1984 these were the people called in to corroborate and resolve the inherent division of the legal voice, formalizing an acoustic practice inherent to jurisprudence.



Fig. 2. One of René Laennec's original stethoscopes. Source: Science Museum/Science & Society Picture Library.

Auscultation

The audio cassette recorders at the center of the PACE policy show how technology is also inextricably linked to what I claim is a historical audio event. The phonograph, the first machine to ever record and reproduce audio, is usually cited as the technology that revolutionized listening and persists to continually condition the way we listen today. Yet the mode of listening and audio discourse employed by these forensic analysts of sound, despite their dependence on technologies for voice recording, owes its origins more to a piece of technology that predates the phonograph: the stethoscope.

The invention of the stethoscope by René Laennec in 1816 formally inaugurated the practice of auscultation (listening to the inner sounds of the body). Laennec's work to classify the sounds of the body is a major contribution to medical diagnosis and the image of the stethoscope is now a symbol of the medical profession at large. As an international symbol of medical treatment the stethoscope communicates medicine as a terrain of care and a space where the concerns of the patient can be heard. It symbolizes the human communication between doctor and patient. Yet its material legacy is quite different. What the stethoscope actually did was to allow the doctor to bypass the testimony of patients and instead communicate directly with their bodies. It was a technology that allowed doctors to no longer depend on the subjective accounts of their patients' illnesses. Understanding how to interpret sounds from hearts, stomachs, and lungs meant that the doctor could communicate with the objective truth of the body, as this emerging acoustic lexicon was thought of as a collection of voices which, unlike the speech of the patient, didn't lie; these were voices which couldn't dramatize, embellish, and exaggerate their condition. The stethoscope shifted the medical ear from listening to the patient's self-diagnosis to listening to the sounds of the body.

Just like forensic listening, the stethoscope pits the subject against itself as simultaneous testimonies can be emitted from the body and from the speaking voice. In auscultation there exists a very literal example of this doubling of the voice. Egophony is the name given to the process whereby, while listening to the lungs with a stethoscope, the patient is asked to say the letter "e." If the lungs are clear, the doctor listening with the stethoscope will detect the spoken "e" ("ee") as sounding like an "ee." Adversely, if the lungs contain fluid or a tumor, the patient's spoken "e" will sound like a phonetic "a" ("ay"). The "e" sound is transmuted to an "a" sound through the body. This "e" to "a" transmutation shows us the ways in which the voice becomes doubled in the medical ear and how one voice can produce multiple accounts of itself. The example becomes increasingly literal when we examine the name for this auditory event, egophony. Literally ego—"the self" and *phone*—speech sound. Yet this self-identifying speech sound (ego-phony) could also be understood as ego-phony—the fraudulent self. And when we combine all these definitions we arrive at a name for a form of listening that almost perfectly describes the intentions of auscultation, i.e., detecting a

fraudulent (phony) speech sound (phone) which betrays the self (ego).[3]

The paradox of the stethoscope is that it simultaneously produces an objective distance from the patient and a deeper proximity to their body. As a nonelectronic device it simply connects a material path through which vibrations can be channeled from the inner body of the patient directly to the eardrums of the doctor. This distanced yet deep material form of human contact is also characteristic of forensic listening, whereby one listens not to the semantics of language but to the molecular constitution of individual phonemes. This shared practice of listening which transmutes subject into object reveals a direct lineage from auscultation to forensic phonetics. Auscultation offers the law, as it offered medical practice, the promise of amplifying the objective aspects of an otherwise deeply subjective account of an event. Yet in such cases one can adequately listen to only one aspect of the voice at a time; the qualities of the voice as object mute the subjective and semantic enunciations or vice versa. The shift from one form of listening to another can happen insidiously and invisibly and yet, as we will see throughout this essay, its political impact and effect on the listened to populace can be radical.

During my 2010 interview with the forensic linguist Peter French he told me: "Last week, a colleague and I spent three working days listening to one word from a police interview tape."[4] Statements like this exemplify French's radical approach to both listening and the theoretical paradigms that surround audio culture. Unlike many sound theorists who focus on sound's ephemeral and immaterial qualities, French's approach is markedly material. The contemporary dominant school of audio culture is heavily influenced by Don Ihde's 1976 text *Listening and Voice: A Phenomenology of Sound*, which puts forward the impossibility of fundamentally grasping sound.[5] The continuing prevalence of this school of thought is demonstrated in the 2009 book *Sounding New Media* by Frances Dyson, who states in the introduction: "As Don Ihde pointed out decades ago 'a sound is always multiple, always heterogeneous, being neither visible or tangible, sound is never quite an object, never a full guarantor of knowledge.'"[6] Yet French's formulation renders sound dissectible, replicable, physical, and corporeal in its object quality. What allows French's radical approach to sound is the forensic intensity at which he listens, which allows the audio object to reveal a large amount of information as to its production and its form: the space in which it was recorded, the machine that recorded it, geographical origin of the accent, as well as details of the age, health, and ethnicity of a voice.



Fig. 3. Dr. Peter French profiling a voice. Photo: Lawrence Abu Hamdan, 2009.

Yet as with all cases of legal, social, and ethnic profiling, French walks a thin ethical line. Ironically, what allows French to maintain his credibility in a time in which law enforcement increasingly reaches out to forensic linguistics in odious forms of surveillance and profiling that target huge swathes of the population, is his ability to listen better. French understands the limits of what can be detected through the voice and therefore avoids exploiting the law's generally increasing demand for the empty promises of forensic science and its ignorance regarding their practical capacity.

Forensic listening is now being applied more than ever before. Its application is primarily on two fronts: speaker profiling of asylum seekers and developing voice-activated algorithms for the security industry. Today it is applied on such a scale that law enforcement agencies and security services cannot often afford the expert listening of people like Dr. French. Hence, frighteningly, we are entering a time in which there is both an overcapacity demand for the governance of the voice, and an inadequacy of authentic means of producing such a governance. In other words, we have now entered a sorry phase where bad listening (and therefore bad evidence) is flooding the forum.

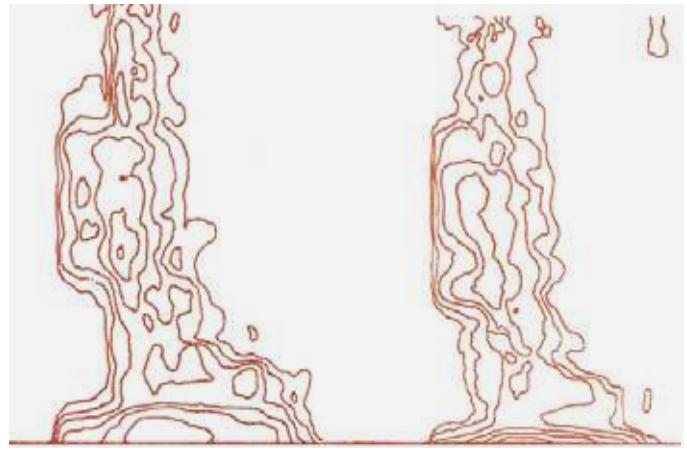


Fig. 4. "Two You." The image documents voiceprints (voice fingerprints) of two different voices saying the word "you." The means by which one can read this image and make comparisons between the two different voices is by understanding that the horizontal axis is time and the vertical axis is frequency. The contour lines then illustrate the amplitude of a specific frequency at a specific time in the pronunciation of the word "you." In the use of cartographic techniques to produce voiceprints we can see clearly the interrelation of the control over both voice and territory. Image source: Ira M. Freeman, *Sound and Ultrasonics* (London: Random House, 1968).

Juris-Diction

What we will understand as I develop explanations of the most recent and prolific examples of forensic listening is that it is not simply governance of the voice that has been made more pervasive but also the employment of these modes of listening in the control of territory and the production of space. Their use as agents of spatial control is made clear if we take a closer look at legal terminology and practice, in order to see how forensic listening becomes a technically instantiated and formalized process of fundamental legal concepts. If we divide the term "jurisdiction," which connotes a territorial range over which a legal authority extends, we see that "juris" refers to a legal authority or right and "diction" refers to speech. "Diction" in linguistics is also defined as the manner of enunciating and uttering sounds and words, indicating not simply speech but the process of enunciation and amplification of words. By understanding the etymology of the term jurisdiction, we see that the law itself operates as a speech space in which those within its range of audibility are subject to its authority. As a fundamental principle of legal governance, jurisdiction reveals to us the power of sound in the construction of the space and time of the law. Much like the radio in the workplace, the audio medium affords the law a means of controlling space and interpolating its subjects while remaining predominantly out of sight. In the following example we will see how the law's practices of auscultation are radically remixed and used to amplify the scope of the legal frontiers of a given juris-diction.

By 2003, the United States and the United Kingdom were entrenched on two fronts in the War on Terror. These wars forced mass migrations that became the catalyst for immigration authorities around the world to turn to forensic speech analysis to determine if the accents of asylum seekers correlated with their claimed national origins—i.e., to see whether people originated from areas which would mean that they were legitimately entitled to asylum. On a scale similar to the 1984 PACE act, this produced a huge proliferation of forensic listening, this time employed to help determine the validity of asylum claims made by thousands of people without identity documents, particularly in Australia, Belgium, Germany, the Netherlands, New Zealand, Sweden, Switzerland, and the United Kingdom.

In most of the countries listed above the protocol is as follows: a telephone interview is organized between the asylum seeker and a private company run by forensic phoneticians based in Sweden: Sprakab. Using anonymized analysts (which many claim are actually former refugees with no linguistic training) the claimant's voice is elicited, recorded, and analyzed and subsequently a report is produced and given to the immigration authorities. The confidence in, and the rapidly increasing predominance of, this kind of investigation within immigration law is troubling, given that its accuracy has been called into question by many forensic linguists, phoneticians, and other practitioners around the world.[7] One of the main concerns of this group of linguists is to advocate for the idea that citizenship is a bureaucratic distinction and that the voice is a socially and culturally produced artifact that cannot be tidily assimilated into the nation-state.

In undertaking extensive research into this politically potent form of listening I heard many shocking accounts of vocal discrimination and wrongful deportations—none more so than that of Mohammed, a Palestinian asylum seeker who, after having the immigration authorities lose his Palestinian identity card, was forced to undergo an accent analysis to prove his origins. During his deportation hearing he was told by the asylum tribunal that he was lying about his identity and the judges paid particular attention to the way that he pronounced the word for tomato. Instead of "bandora" he said "banadora." This tiny "a" syllable is the sound that provides the UK border agency with the apparent certainty of Mohammed's Syrian origin: a country only twenty-two kilometers away from his hometown of Jenin in Palestine. Therefore, in designating this syllable as a marker of Syrian nationality, the border agency implies that this vowel, used in the word tomato, is coterminous with Syria's borders. The fact that this syllable designates citizenship above an identity card that contradicts it forces us to rethink how borders are being made perceptible and how configurations of vowels and constants are made legally accountable.

Locating this Syrian vowel in the speech of a Palestinian surely proves nothing more than the displacement of the Palestinians themselves. In other words, the instability of an accent, its borrowed and hybridized phonetic form, is testament not to someone's origins but only to an unstable and migratory lifestyle, which is of course common among those fleeing from conflict and seeking asylum, often spending years getting to the target country and living in diversely populated camps along the way. Moreover, it should be remembered that in such camps one may want to conceal the origin of one's voice because of the continual fear of persecution.

When calling for ways in which to implement better practice in cases of language analysis for the determination of origin of undocumented and illegal migrants (LADO), forensic linguist Helen Fraser says that we "need to clearly separate linguistic data from potentially biasing background on the applicant's 'story.'"[8] Clearly in this expression of objectivity we see how linguists want to auscultate the accent and go beyond the potentially traumatic and pathetic "story" of a person's flight; preferring to find in their speech another type of testimony. However, my argument is that for adept forensic listeners this accent object (linguistic data) should also be heard as a "story" in itself, one that could reveal an account just as traumatic. In other words, for listeners who are not content with drawing a border around a single phonetic article, the accent should be understood as a biography of migration, as an irregular and itinerant concoction of contagiously accumulated voices, rather than an immediately distinguishable sound that avows its unshakable roots neatly within the confines of a nation-state. In the clear distinction between biographical data and linguistic data, we see how this policy is used as a practice which does not seek to excavate the life of an accent, and ultimately only highlights the virtual impossibility of locating its place of birth.

Like all practices of auscultation, the forensic analyst's can be understood as operating in the excess of the speaker's intentions. Yet due to issues of mimicry, contagiousness, and survival, the life of an accent is possessed to a greater or lesser extent by every living person it has ever come into contact with, especially influenced, of course, by the one voice with which it is presently in dialogue. Such a cartography of a voice is thus further complicated by the very presence of the cartographer and his/her own voice. In the case of Mohammed, his rejected status is owed to an interviewee whom Mohammed claims was an Iraqi Kurd and whose Arabic dialect was so different to his that he had to shift his way of speaking simply to be understood and to understand.[9] Listening is never simply a passive, objective, and receptive process, but rather an act that plays a fundamental role in the construction and facilitation of the speech of the interlocutor (whether subject or object). Therefore what becomes amplified in such investigations is not the true identity of the sonic object under investigation but the political potency of the listening itself and the agency of the listener. In other words, the results of this forensic listening tell us little about Mohammed's accent but a great deal about the contemporary political context in which this audio investigation participates.

The form of listening that is presented in the case of Mohammed shows us that in its attempt to move away from the subjectivity of the speaker and

to objectify their voice, another layer of subjectivity becomes established: that of the expert listener or interpreter of sounds. The forensic listening paradox is perfectly performed in this case, whereby in an attempt to hear objectively, the listener's own subjectivity emerges and is made distinctly audible (through the way his listening acts upon and transmutates the subjectivity of the interviewee). This then allows one to ask the question: as an intersubjective process, can listening ever be objective? Will listening always be tainted by the subjectivity of that which listens? In attempting to answer these questions we quickly reach the fundamental paradox and the empty promise of forensic listening. Perhaps the only way to detach oneself from any given situation is to listen, as Dr. French does, to a single syllable for three days, until the sound becomes completely abstracted from humanity and the culturally preprogrammed prejudice of the ear.

The Right to Silence

In attempting to establish a correlation between voice and citizenship we encounter another vocal legal paradox. In criminal charges against a citizen of the United Kingdom, the criminal is afforded the right to protection from self-incrimination; commonly known as the right to silence (or in the United States as Miranda rights). This is a fundamental legal right not to speak if you feel that your speech would in some way incriminate you. When hearing the specific words of the right to silence issued by the police you know that your voice has been placed in custody and that your voice has crossed the threshold between normal conversation and liable speech. However, with speech profiling becoming a more and more widespread form of investigation, it is not only our words that can incriminate us but the phonological content of our voices as well. Therefore, just as our speech is being mutated by the legal system we must ourselves fight to rephrase the legal diction so that it remains transparent about the ways in which our voices are placed under custody and investigated. My proposal for altering the way the law speaks to us entails changes from the moment of one's arrest onwards, and therefore entails amending the right to silence. In the United Kingdom, the revised version might read:

> You do not have to say anything. But it may harm your defence if you do not mention when questioned something which you later rely on in court. Anything you do say, *including the way you say it*, may be given in evidence against you.

Yet even if these alterations to the right to silence were to be made, we would still need to understand that this fundamental legal right is only afforded to the citizen; the asylum seeker, for example, has no recourse to silence, as the burden of proof lies not with the prosecutor in such cases but with the claimant themselves: in other words, if they don't speak they will be deported. Without the right to silence, the asylum seeker is forced to speak to the law; they must make themselves audible to the system and yet they remain without control over the conditions of how they are being heard. What they do retain, however, is the human right to freedom of expression and it is my argument that this policy of listening contravenes this fundamental right.

These forensic speech analyses force us to redefine our right to freedom of speech, a concept that must now be extended to encompass not only the words we speak, but also the sonic quality of our speech itself. The voice has long been understood as the very means by which one can secure and advocate one's political and legal interests, but these recent shifts in the law's listening affirm that the stakes and conditions of speech have altered in a nontransparent way. This shift is seemingly minute yet, as we see in the voice analyses of asylum seekers, can have a dramatic impact on people's lives. Therefore, the more radical the practices of listening at the core of legal investigations become, the more they herald the advent of a moment to redefine and reshape the political conventions of speech and sound in society. Now it seems that the battle for free speech is no longer about fighting to speak freely, but fighting the control over the very conditions under which one is being heard.

The Whole Truth

The latest development in forensic linguistics, and hence the closing example of this essay, is the product of the combined labor of mathematicians and speech scientists to produce computer algorithms that allow users to automatically profile voices for a variety of different applications. The most prominent of these applications is "voice stress analysis," the premise of which is that, through a frequency analysis, the physiological conditions of stress are made audible by the nonverbal elements of a voice. This technology is said to be able to determine all sorts of psychological verdicts based on jittering frequencies, glottal tension, and vocal intensity, all regardless of language.

At Delft University in the Netherlands a team of linguists and computer scientists are developing a kind of "trauma-o-meter" application for emergency calls whereby the algorithmic listening software would determine the priority of a call depending on the level of stress detected in the caller's voice. The idea behind this is that the tension of the vocal chords produce "jitter," which in linguistics relates to fluctuations in pitch, and that the level of stress a person is undergoing can be observed in the intensity at which these minute fluctuations occur. Therefore the scale of the emergency is legible as affect on the body that witnessed it. Regardless of what is being said, the first response to the event will then be a response to the body of

its witness. In building a hierarchy of trauma this machine also produces a chain of command that situates the paralinguistic aspects of the voice as an authority over the words that the caller wishes to relay. The stress the body undergoes here is considered the objective truth of the event; yet in my next example these same physiological attributes are taken to reveal the opposite—a lie.

A piece of software called Layered Voice Analysis 6.50 (LVA 6.50), developed by Israeli company Nemeysesco Ltd, is the major application of this new form of forensic voice profiling: it is currently employed as a lie detection method by the Los Angeles Police Department, Russian and Israeli governments, and insurance companies all over the world. In the United Kingdom, Harrow council and many others are using it to measure the veracity of benefit claims made by disabled citizens. Harrow council claims they have saved roughly £330,000 of benefit payouts in the first seven months of using this software.[10] Lynn Robbins, director of the company Voice Analysis Technologies LLC, the main retailer of the software, told me in an interview that based on analysis of the body as it resonates through the voice, LVA 6.50 can not only determine whether a person is lying, but is able to deliver a whole series of verdicts—detecting, for example, embarrassment, overemphasis, inaccuracy, voice manipulation, anxiety, and whether or not the interviewee is attempting to outsmart his/her interlocutor; in the future, I was told, it will even be able to hear sex-offending tendencies.[11]



Fig. 5. Screenshot from Layered Voice Analysis 6.50 which examines micro fluctuations of voices in order to corroborate what the subject is saying. Source: www .LVA650.com.

Commander Sid Hale is piloting the software for the Los Angeles Police Department and explains: "Unlike the polygraph we don't need to cooperate with the suspect, we don't need to wire them up with skin responses or respirators, it does it in real time."[12] This idea of being able to access the body of the person who is the object of one's interest without touching it is very attractive to law enforcement agencies, just as it was to doctors who first used the stethoscope at the beginning of the nineteenth century. Reports from that time say that one of the benefits of the stethoscope was that it meant doctors no longer needed to press an ear to the patient's body, and hence it provided them with a hygienic distance from the potentially diseased patient. In LVA 6.50 we see how this technology produces and appropriates this hygienic, physical, and objective distance. One key, politically sensitive effect of the fact that LVA 6.50 can operate without physical interaction—the voice analysis might be conducted during a telephone conversation, or using a prerecorded sample—is that testing can be undertaken without the consent or knowledge of the subject.

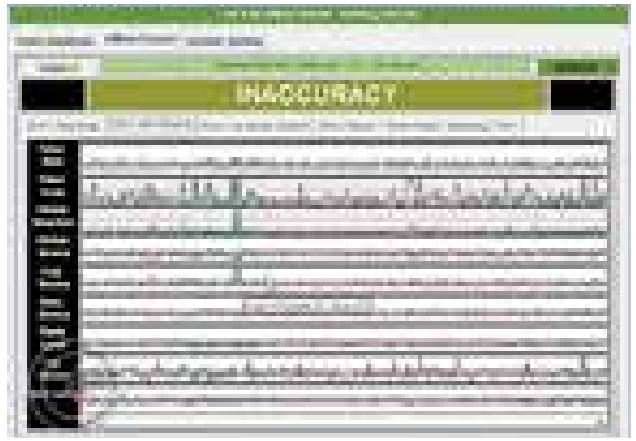
In the context of borders and prisons, this hygienic distance allows the authorities to access the emotional and bodily content of the noncitizen (e.g., the prisoner or refugee) without needing them to formally enter the society of citizenship. At the border this test can be performed before a person formally enters the country, or even before they leave their country of origin—meaning that LVA 6.50, in making use of the hygienic distance of audibility, enables the extension of the border itself. This software simultaneously extends the range of the law's juris-diction while also designating those who must remain beyond its range of responsibility/audibility, differentiating between those to be afforded the rights of a citizen and those to be denied those rights, and the possibility of claiming refugee status.

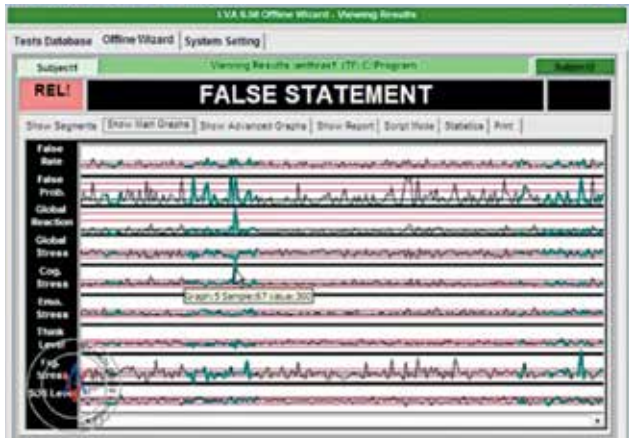
Although in the legal context there has never been a need for an ear to be pressed against the suspect's body, the principle of *habeas corpus*, as discussed above, requires that the subject be brought physically before the law (e.g., in an interrogation room or courtroom) in order to have a legal hearing. Yet we could easily imagine how LVA 6.50 would eradicate the necessity for the physical presence of the suspect, as it requires only a voice to access the corpus. In this sense, LVA 6.50 short circuits the process of *habeas corpus*, using an algorithm and a visual interface to give the law access to what a person's body is "really" saying as they speak, even if that body is thousands of miles away.

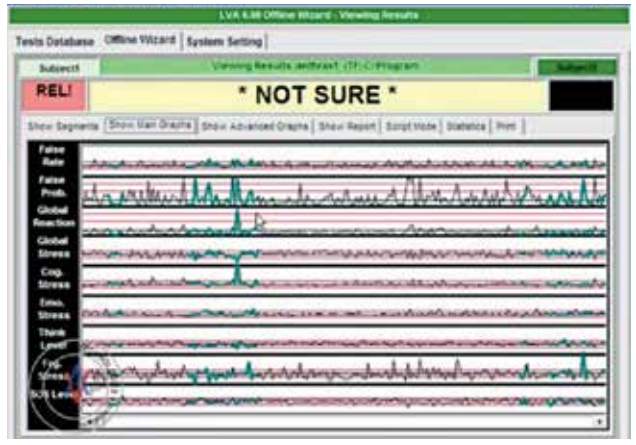
This distance-producing (voice stress analysis) machine is not only designed to distance the user from the subject of analysis; it also works to remove or minimize the presence and role of the user (the interrogator, insurance broker, border guard, etc.). In an interview situation, the visual interface flashes up its verdicts as the interviewee speaks. This machine thus promises to listen on behalf of its operator, reducing or putting into question their interpretative and intuitive capacities. In this sense this technology not only mutes the words of the speaker, but also deafens the listener. And although a direct lineage can be traced from the stethoscope to voice stress analysis technologies, the removal of the necessity for the operator to listen articulates the fundamental break with auscultation as a practice. Auscultation shifted a mode of listening from the speech to the body yet it still required listening at its very core and in fact inaugurated a new epistemology of listening that is still taught to millions in the medical profession today. Though it practices auscultation, LVA 6.50 does not teach new ways of listening; in the microscopic analysis of the frequencies of the human voice it can hear beyond the range of human audibility and therefore it excludes the possibility of building new auditory skills. Unlike the work of forensic listeners like Dr. French, its means of listening does not hold the potential to increase, fine-tune, and augment human auditory experience.

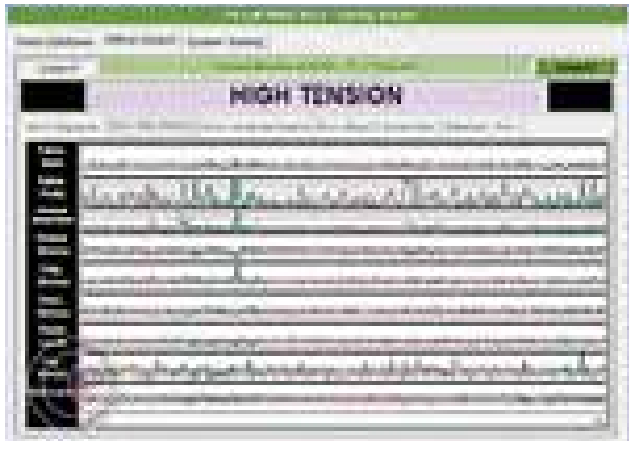
Not only does LVA 6.50 listen on behalf of its user, but in its registration of emotional content (anxiety, aggression, fear) this software feels on behalf of its user as well. Using this software the interviewer no longer needs to be sensitive to the psychological condition of his subject.

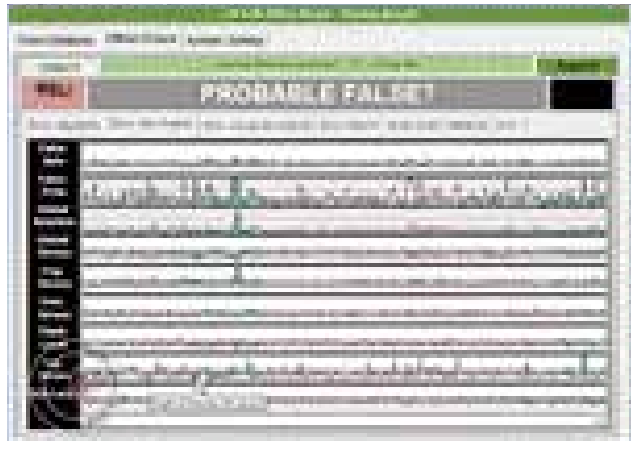












Figs. 6–11. Screenshots from Layered Voice Analysis 6.50 which examines micro-fluctuations of voices in order to corroborate what the subject is saying. Source: www.LVA650.com.

The machine thus produces apathetic operators who listen to neither words nor tone of voice, and therefore minimizes the extent to which the interviewer dirties themselves with the subjectivity of the interviewee. This machine is so attractive to law enforcers because it recognizes the fundamental flaw of previous modes of forensic listening: that in objectifying the voice the one who causes its objectification becomes amplified in the process—i.e., that the subjectivity of the speaker is replaced by that of the listener/interpreter/aural investigator. In order to produce the laboratory conditions for justice and a completely objectified realm of listening, law enforcement recognizes that listening must be relegated to the machine. Yet in voice stress analysis there still remains the glitch of the subject contaminating the legal laboratory, as these algorithms first have to be programmed by people who could have bigoted ears and economic agendas. To produce a verdict the algorithm needs to learn the logics of those verdicts—e.g., in order for it to profile the voice of a sex offender it first needs someone to teach it the vocal attributes of a sex offender.

In response to the astounding claims of LVA 6.50's highly sensitive and microscopic listening, a group of speech scientists and mathematicians in the department of phonetics at the University of Stockholm closely examined the product's technical patent and reverse engineered the software in order to test its scientific credibility. The idea that the machine would work "regardless of language"[13] was taken seriously by the group, who tested the software using only vowel speech sounds and single phonemes. Interested to see how the machine produced its wide range of judgments the group used the pure object of speech; de-subjectified voices speaking only vowels

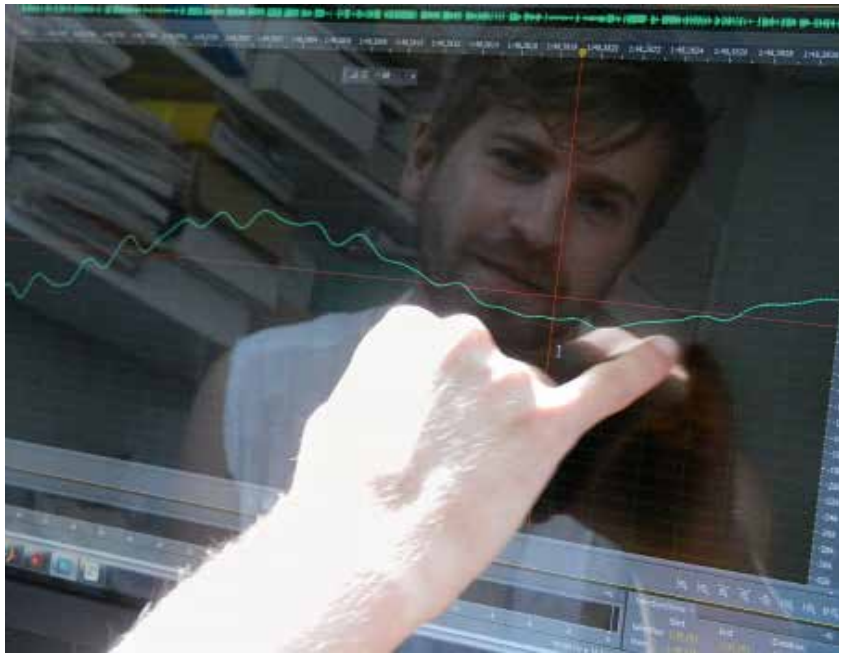


Fig. 12. "This is what the truth looks like." Andreas Takanen at the department of phonetics at the university of Stockholm shows the inner algorithmic/horoscopic workings of LVA 6.50. Photo: Lawrence Abu Hamdan, 2009.

without thought or semantics. After months of testing the machine and collecting large amounts of data they understood that the software was operating on a very basic level of amplitude and found that it simply had to do with a person's capacity to hold a steady pitch and volume. They also claim that the distinctions between the various verdicts (e.g., between embarrassment and attempt to outsmart or excitement and inaccuracy) are arbitrarily placed along this scale. According to their investigation, the claim that the technology functions as a lie detector is bogus; one of the mathematicians working on the reverse-engineering project told me that its logic was akin to "a horoscope or a prophecy" in its pseudoscientific nature.[14]

Though the mathematician was using an analogy of the horoscope as a means to scientifically discredit the software, for me the term horoscope resonated differently. I found the analogy of the horoscope useful because of the ways in which in introduces "fate" into the above discourses of legal, ethnic, and social profiling to which forensic listening dedicates its ears. Just as the horoscope removes the agency of people and insists that their fate rests on the alignment of the stars, LVA 6.50 removes the agency of the listener and the speaker and allows a machine with apparently very little interpretative potential to forecast our place within a predetermined cosmos. What we can learn from the horoscope analogy is that the human actor is not required here; if simply speaking individual vowels, phonemes, or babble can reveal our true intentions then our actions are irrelevant. Without even acting the software reveals the script that is within us.

LVA 6.50 amplifies the dark phrenology of the voice which is operative today. Regardless of whether they scientifically work or not, pieces of software which use the voice as biometric tool deeply confuse its role as a conduit for language and negotiation. Simply by virtue of the fact that insurance companies, government councils, and police departments use these forms of listening offered by LVA 6.50, the software is weaponized, regardless of its credibility amongst the scientific community.

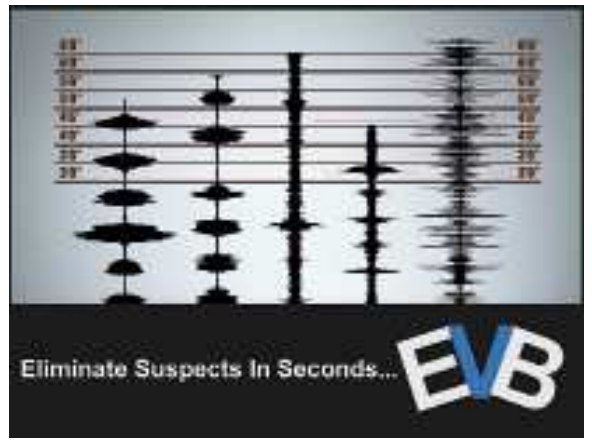


Fig. 13. Promotional image for a voice biometrics software. Source: http://easyvoicebiometrics.com.

In the sites where speech acts it is our speech which is under attack. The promise (empty or not) of LVA 6.50 or of LADO (the accent analysis of asylum seekers) to reorient the speaking subjects contained within any given juris-diction is already underway. In this essay I have intended to relay a certain history of legal listening that begins with listening to words and accounts, moves to a type of listening that doubles the speaking subject into two parts (words and speech sound), and culminates, through increasingly degraded forms of listening, in the total eradication of the speaking subject. We arrive at an uncertain future of the voice and a moment to question its very legitimacy as both

an object of legal investigation and the means through which the law becomes enacted. Assuming an increasing proliferation of these emergent and mutated strands of forensic listening forces us to ask more general questions about the role of the voice as a central legal infrastructure: will it still be a fair and just hearing when nobody is listening?

1 Thomas Keenan and Eyal Weizman, "Mengele's Skull," *Cabinet*, no. 43 (Fall 2011): 61–67, at 62.
2 Audio recorded interview with Dr. Peter French, York, 2010.
3 Etymologically speaking the word "egophony" seems to have been subject to its own "ee" to "ae" transmutation, as medical dictionaries suggest egophony is a compression of the original aegophony and that the aego derives from the Greek for goat (aix/aig-), which in turn is derived from the goatlike sound made by the phoneme whilst it is being auscultated by the doctor. While perhaps not literal this bestial etymology is also somewhat revealing of the intentions behind auscultation, as it is an effort to avoid all the disorientating subjective embellishments that language provides as it reduces speech to a prelinguistic state; an animal binary where in which the voice is used to express only pleasure or pain.
4 Ibid.
5 Don Ihde, *Listening and Voice: A Phenomenology of Sound* (Athens, OH: Ohio University Press, 1976).
6 Frances Dyson, *Sounding New Media: Immersion and Embodiment in the Arts and Culture* (Berkeley: University of California Press, 2009), 5.
7 See Diana Eades, "Applied Linguistics and Language Analyses in Asylum Seeker Cases," *Applied Linguistics*, vol. 26, no. 4 (2005): 503–26.
8 Helen Fraser, "The role of linguistics and native speakers in language analysis for the determination of speaker origin. A response to Tina Cambier-Langeveld," *The International Journal of Speech, Language and the Law*, vol. 18, no. 1 (2011): 121–30, at 123.
9 Interview included in Lawrence Abu Hamdan, *The Freedom of Speech Itself* (2012), audio documentary.
10 "Using Nemesysco LVA technology in the Department for Work and Pension, UK-ITN news clip," uploaded February 2, 2010, http://youtu.be/QwJadfVoc00.
11 Audio recorded interview with Lynn Robbins, London 2012.
12 "Nemesysco's Investigation Focus Tool Video," National Geographic, uploaded August 28, 2012, http://www.youtube.com/watch?v=6nvXHQuUoOQ&list=PL8C31084C75D27F3C.
13 See the LVA website, http://www.lva650.com/faq.html, last accessed September 2013.
14 Audio recorded interview with Andreas Takanen, Stockholm, 2012.

Case: Bil'in

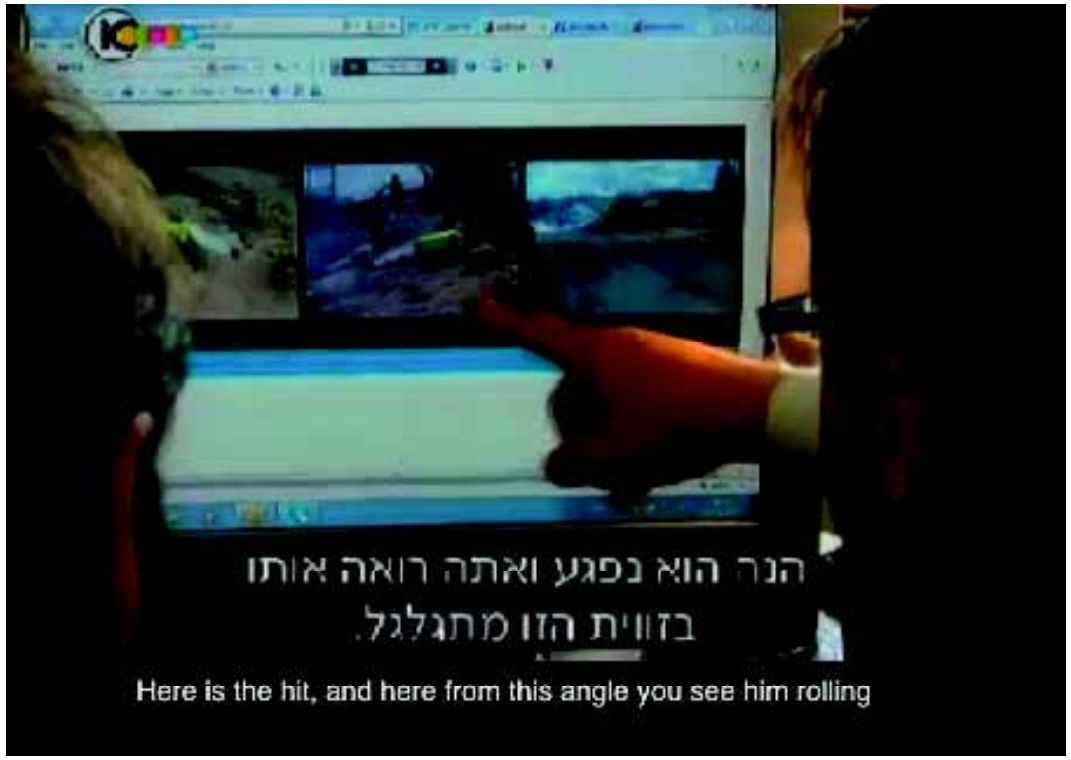


Fig. 1. Israel Channel 10 news report showing advocate Michael Sfard presenting Forensic Architecture and SITU Research's report on the death of Bassem Abu Rahma in the West Bank village of Bil'in on April 17, 2009.

Citizen-Video Analysis: The Shootings of Palestinian Demonstrators by Nonlethal Munitions, West Bank, 2008–2009

Each Friday in Palestine, a number of nonarmed demonstrations are held against the Israeli occupation: acts of solidarity between Palestinian, Israeli, and international activists. The following two cases deal with what the Israel military calls "nonlethal munitions"—in our cases, tear gas and rubber coated steel bullets—shot at unarmed participants in these protests. The village of Bil'in, located on the western slopes of the West Bank, is at the heart of these struggles. In 2004, the wall was built on the village lands in a way that allowed the expansion of the nearby settlement of Modi'in Illit. In 2007 the Israeli High Court of Justice ordered the dismantling of the wall in this area and its relocation to a less invasive path. While the military avoided implementing the court ruling, demonstrators continued to protest the injustice of the wall and that of the occupation as a whole. The Abu Rahma family was at the forefront of these acts of civil disobedience. Both cases discussed in this investigation—that of Bassem Abu Rahma and that of Ashraf Abu Rahma—concern members of this family: Bassem was killed at a protest in Bil'in, while Ashraf was shot in the village of Ni'lin, just to the north. Their sister Jawaher Abu Rahmah was also killed on December 31, 2011, after inhaling tear gas while demonstrating in Bil'in. These demonstrations drew much local and international media attention, as well as an Oscar nomination for the film *5 Broken Cameras* (dir. Emad Burnat and Guy Davidi; France, 94 min.) which documented them. The strategy of non-armed civil, international struggle also included legal action in relation to different issues. One result was that the military finally amended the path of the wall in 2011. However, half of the land that was originally taken remains on the other side of the wall.

Bil'in

On April 17, 2009, Bassem Abu Rahma was shot and killed in Bil'in during a demonstration against the separation wall that was being built on the village lands. Abu Rahma was hit with a tear-gas canister shot from across the wall which in this area, at the time, was a system of fences. He was standing on the eastern side of the separation wall when the munition struck him in the chest, causing massive internal bleeding which led to his death.



Figs. 2–10. Stills from the synced video footage. Forensic Architecture and SITU Research.

2. 14.58 sec. before impact. Tear gas is shown between the fencing layers of the barrier separating the Israeli soldiers, on the far side, and the demonstrators. The frames on the right and on the left show footage from hand held cameras. The tripod that captured the frame in the middle is shown on the right. A single soldier is seen in the middle frame across the barrier.

3. 11.05 sec. before impact. On the left is one of the many soldiers, preparing to shoot to lethal shot. On the right, some demonstrators are taking cover.

4. 12.10 sec. before impact. On the left, a soldier with the gun, taking aim.

5. 0.07 sec. before impact. The moment of munitions discharge (reel time 05:44.07). The flight path of the munition is presented in larger fig. 12 on the facing page.

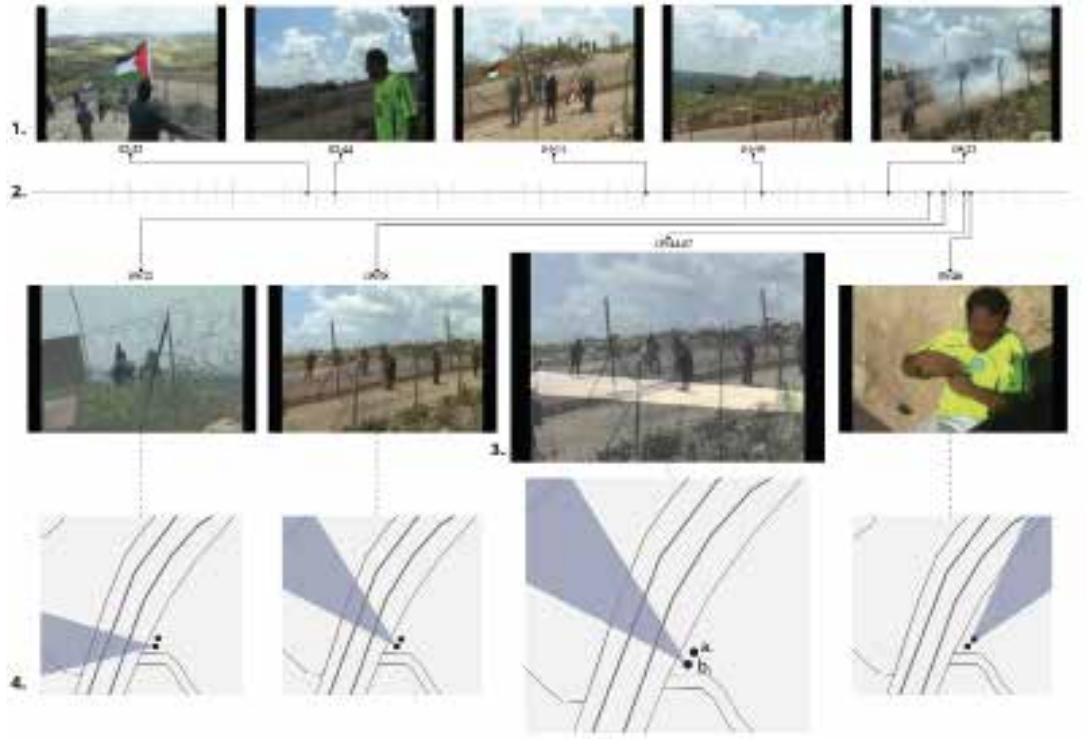


Fig. 11. (opposite top)
1. The video frames from Reeb's camera describe significant moments in the sequence of events leading to the injury.
2. A timeline of the events.
3. The munition in its projectile path appears in the field of view at 05:44:07, passing from upper left to lower right of the frame. This portion of the frame is highlighted here.
4. Each frame is vertically aligned on a timeline, with diagrammatic maps of the scene. On the maps point a. marks the location of Abu Rahma and point b. marks the location of Reeb. The gray triangle marks the cone of vision of Reeb's video camera. Visualization: Forensic Architecture and SITU Research.

Fig. 12. (opposite bottom) Video still (05:44:07) from David Reeb's camera showing the faint trace of the path of the lethal projectile flying from left to right through the fencing system.



The report produced by Forensic Architecture and SITU Research was initiated at the request of attorney Michael Sfard, who acted for Abu Rahma's parents, and the Israeli Human Rights organization B'Tselem. They asked us to examine a host of available data (including videos and photographs taken on the day of the event) in order to ascertain whether the shot that killed Abu Rahma was aimed directly at him. The report focused on establishing the probable angle at which the munition that killed Abu Rahma was discharged. The purpose was to refute assertions made by the Israeli military that the round in question struck a wire in the fence, causing it to change direction and hit the victim, thus unintentionally leading to his death.

As in many contemporary sites of demonstration across the West Bank, in Bil'in there was an abundance of video cameras present. The event was recorded in three sequences of video footage from three different digital cameras (two handheld and one on a tripod). Within the video footage there exists much spatial information. On obtaining the videos we synced them by aligning distinct elements in the sound track. This made it possible to study each moment in the unfolding of the event, the location of Abu Rahma in relation to the position of the wall, and that of the soldiers who shot him, from three separate perspectives.

We then traced the movement of each of the three cameras on a digital model of the terrain whose general contours we obtained from maps and satellite images and whose detailed features we have harvested from examining the video files. Having each person, object, or specific feature represented from two or three separate vantages allowed for a triangulation and the approximation of their location in space. The event was a dynamic situation in which all people—cameramen, soldiers, and Abu Rahma—were in constant movement and key moments were studied to understand the exact positions of the participants.

Fractions of a second directly preceding the impact, one of the videographers, David Reeb, an Israeli artist and political activist, was standing within a meter of Abu Rahma. At approximately 05:38:00, Reeb's video camera is directed to the northwest, aimed at Israeli soldiers deployed on the opposite side of the separation barrier. At 05:44:07, a single frame—whose duration is a one twenty-fourth of a second—captures faint traces of the movement of the projectile from the area where the soldiers are deployed west of the wall, through the fencing system that composes the wall in this part, to the area where the demonstrators are located east of the wall. Fractions of a second later, it strikes Abu Rahma, who is standing directly to Reeb's right and is seen falling to the ground, twisted in pain.

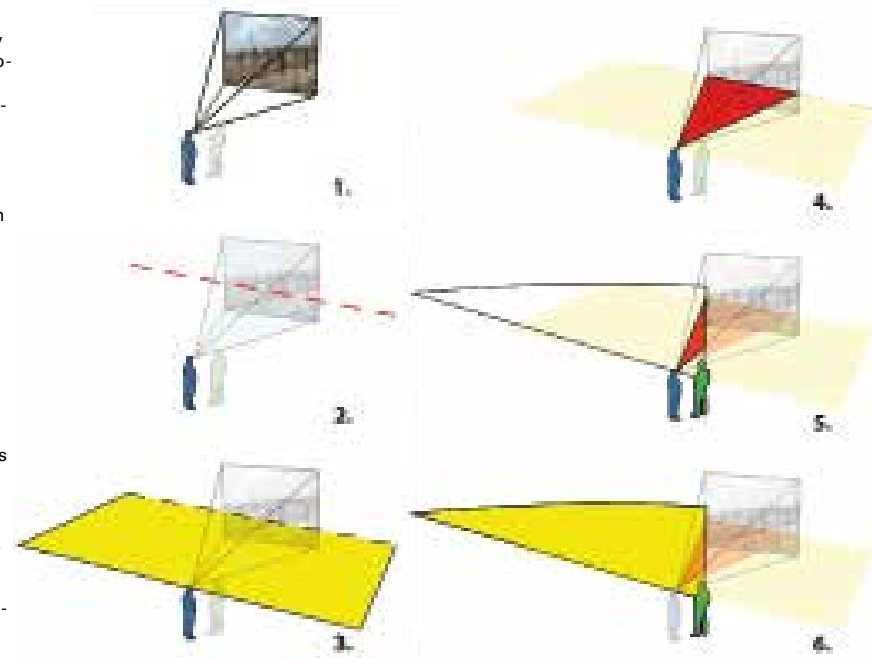


Fig. 13. This series of diagrams demonstrates how the plane of possible trajectories was established.
1. The position of the videographer, David Reeb, marked in blue.
2. The red dashed line marking the path of lethal projectile across one twenty-fourth of a second of video still.
3. The path of projectile is extended into a virtual plain (marked in yellow) at the height of the camera.
4. The red triangular plane highlights the section of the yellow projectile plane that intersects with the camera's field of vision. 5. The projectile plane intersected by lines converging on Abu Rahma's torso limited by David Reeb to the south and the edge of the video frame to the north.
6. The resulting yellow arc leading to the likely firing positions of the lethal projectile by the soldier. Visualization: Forensic Architecture and SITU Research.

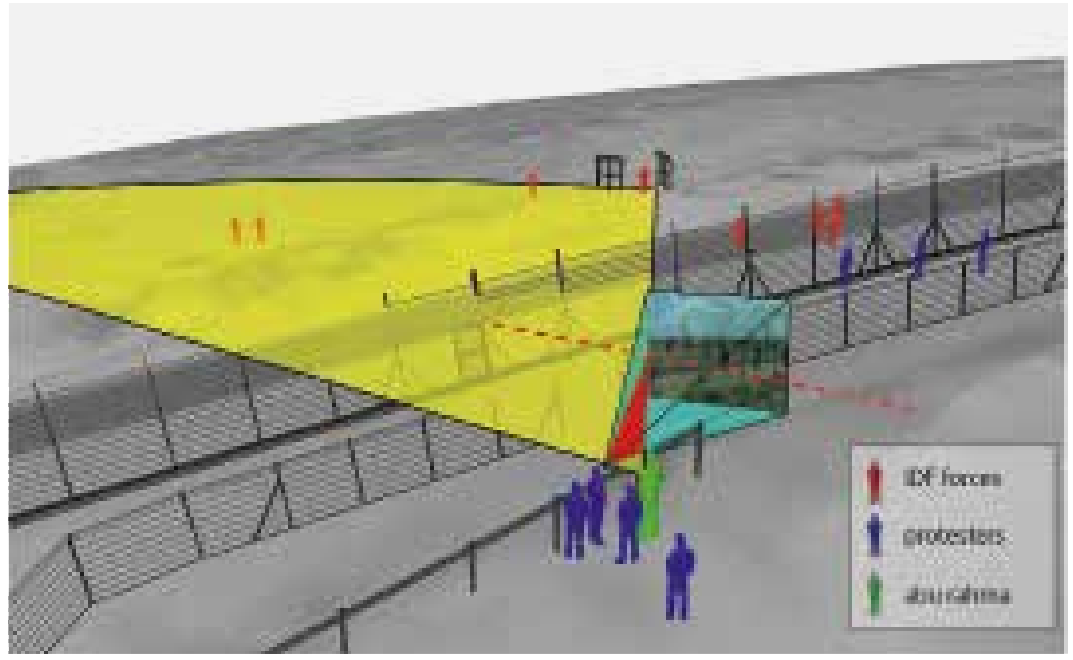
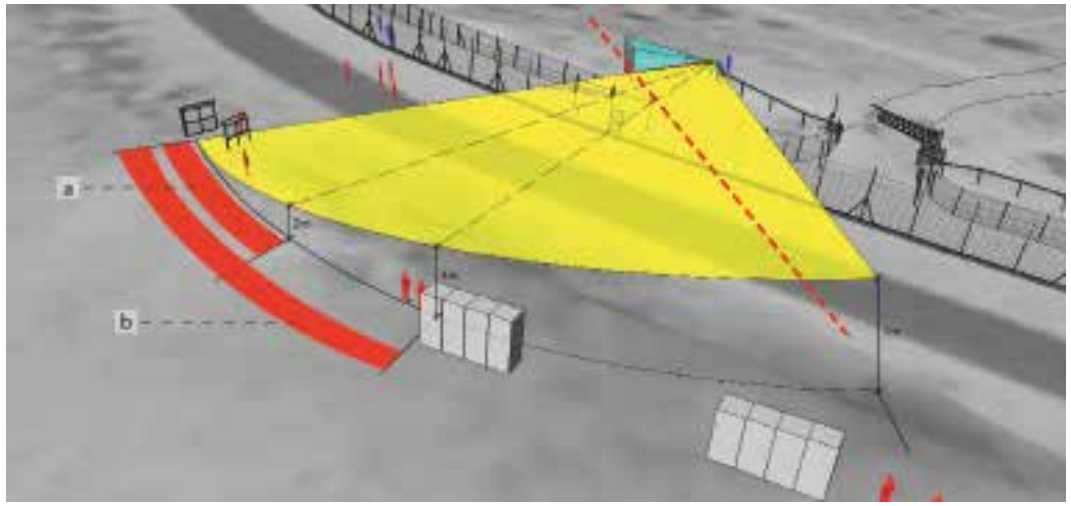
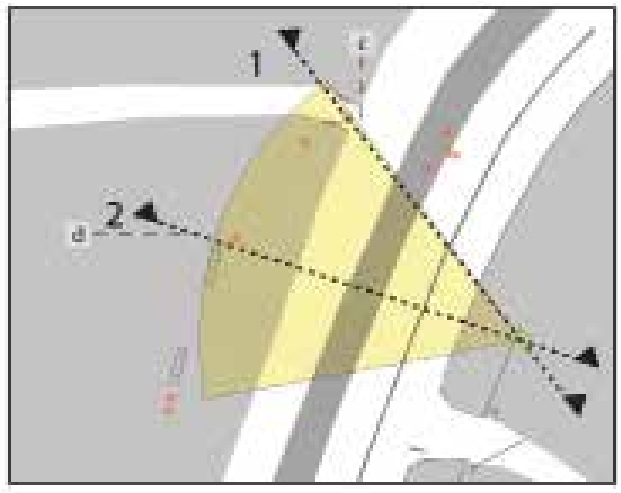


Fig. 14. A digital model of the scene at the moment of the shooting. Visualization: Forensic Architecture and SITU Research.



a zone of direct fire:
-1° to 1° firing angle
b zone of wire deflection:
-1° to 5° firing angle
c highest limli of position
at which lethal shot could
have occured
d lowest limit of position
at which lethal shot could
have occured
e possible trajectory as traced
back from reeb video



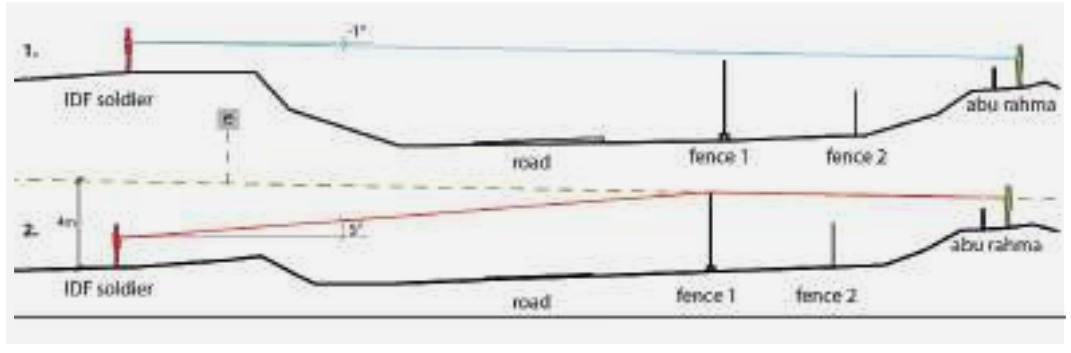


Fig. 15. The height of the yellow virtual plane above the ground on the Israeli military's side of the fence limits the possible locations that the shot could have been fired from. Up to 2 meters high is the zone from which a direct shot could have been fired. Up to 4 meters high, as defined by the intersection of the plane with fence 1, is the zone at which a deflection with the fence could have occurred. At the lowest limit of this zone at which a deflection could have occurred, a section is taken to determine the angle of firing the projectile. This maximum possible firing angle is determined to be 5°. Visualization: Forensic Architecture and SITU Research.

The single frame extracted from David Reeb's video was used to reconstruct the path of the munition in a virtual model of the scene. After locating the position of the camera and Abu Rahma, the line illustrating the trajectory was extrapolated into the space behind to form a plane bounded by Reeb's camera and the edge of the video frame. This virtual plane defines all possible flight paths converging on Abu Rahma. When extended outward beyond the separation barrier, a zone containing the probable firing position is determined. Based on the known positions of the Israeli military soldiers at the time, the maximum angle of fire was determined to be 5 degrees.

The passage of the munition seen in Reeb's cone of vision supports the conclusion that, contrary to the Israeli military statements, the weapon was being aimed well below the allowable 60-degree limit, with the likely purpose of killing or maiming the demonstrator.

Abu Rahma's case was prominently represented in the documentary *5 Broken Cameras*. The film follows the story of the non-armed demonstrations along the wall in the village of Bil'in, and how similar acts by the Israeli military intend to terrorize and deter unarmed activists from participating in future protests.

Outcome

Our report identifying the place and angle from which Abu Rahma was shot and the trajectory of the munitions was presented by advocates Michael Sfard and Emily Schaeffer on March 28, 2010, along with other testimonies of participants. On July 11, 2010, fifteen months after the April 17, 2009, killing of Abu Rahma, the military prosecution opened a criminal investigation, which it previously refused to do. On September 10, 2013, despite the report, the government announced that the military had decided to close the case, citing "lack of evidence" for an indictment, and insisting it did not know the identity of the shooter. The military asked the court to reject the claim, close the file without any indictments, and offered B'Tselem the opportunity to appeal its decision—a process that has been initiated but might take years to reach a conclusion.[1]

Witness accounts gathered by the Israeli NGO Breaking the Silence, which solicits testimony from soldiers, did not identify the soldier by name but suggested that the shooting soldier had since marked an "X" on his grenade launcher—an undisguised sign of satisfaction at having killed an unarmed demonstrator.[2]

Ni'lin

On July 7, 2008, Ashraf Abu Rahma, brother of Bassem, was detained while engaging in a nonarmed demonstration against the separation wall next to the village of Ni'lin in the West Bank. Seventeen-year-old Salam Kanaan filmed the incident from her house in Ni'lin. Abu Rahma was handcuffed and blindfolded. Half an hour after being arrested, the video shows Omri Borberg, an Israeli battalion commander, holding Abu Rahma's arm while a subordinate soldier shoots him in the foot. The rubber-coated steel bullet is fired from a distance of about 1.5 meters. The bullet grazed Abu Rahma's left toe. He received treatment from a military medic, and was released. Kanaan passed a copy of her video on to the Israeli human rights group B'Tselem which, together with Yesh Din, the Association for Civil Rights, and the Public Committee Against Torture, has called for an investigation.

The military, in its defense, claimed that the soldier was aiming at a point two meters behind Abu Rahma. B'Tselem, in turn, asked Forensic Architecture and SITU Research to undertake a spatial reconstruction of the footage, positioning all people involved in a digital model to try to ascertain whether the shot was aimed at the foot or behind Abu Rahma.

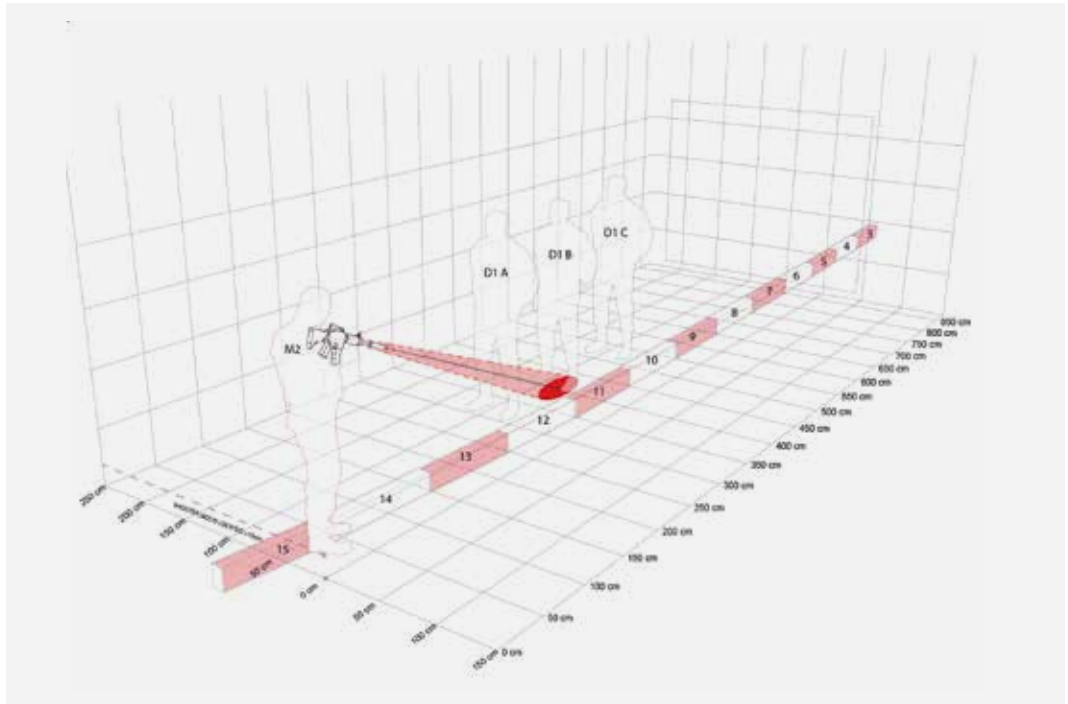
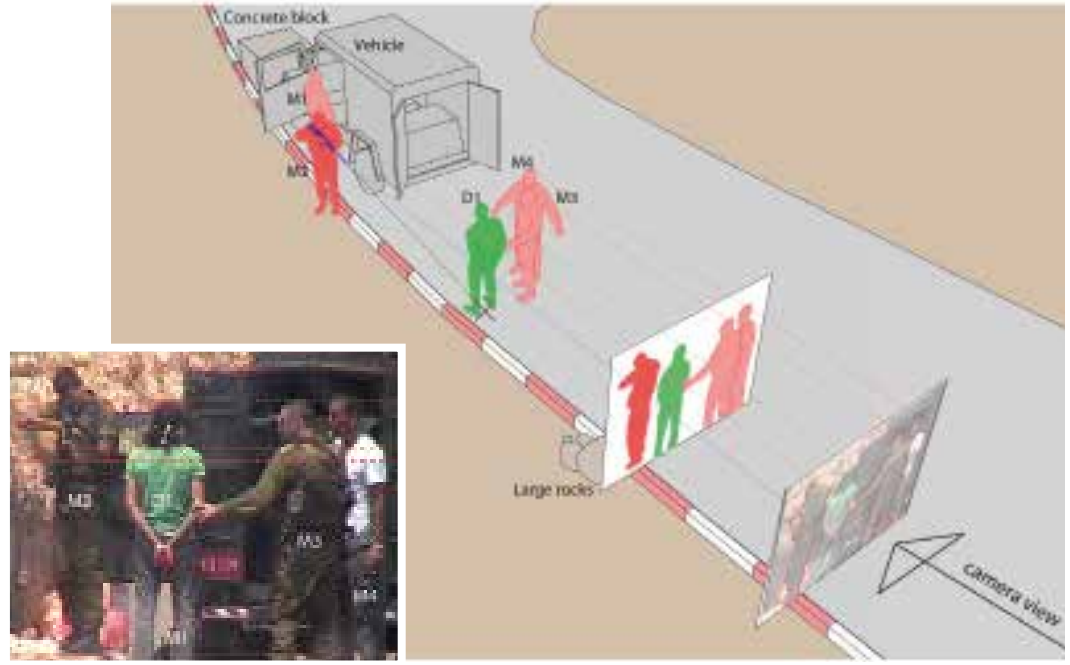
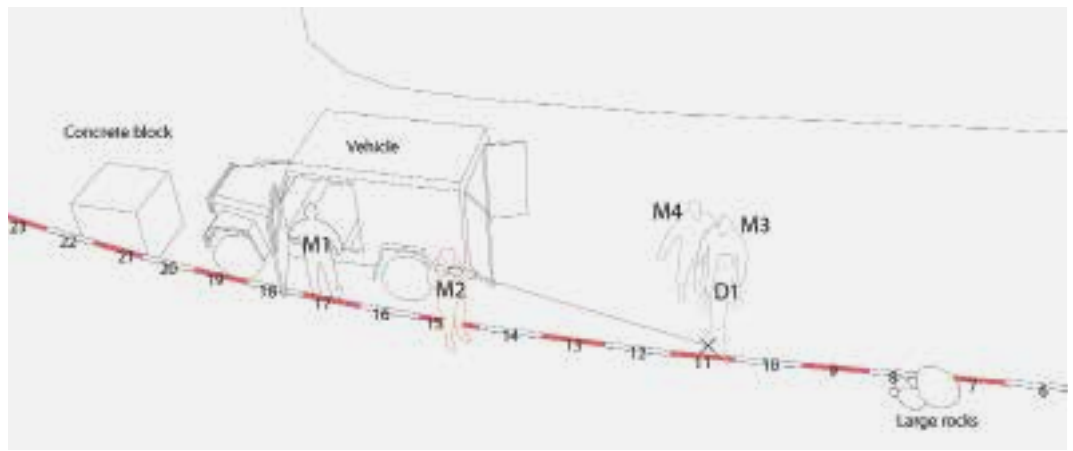


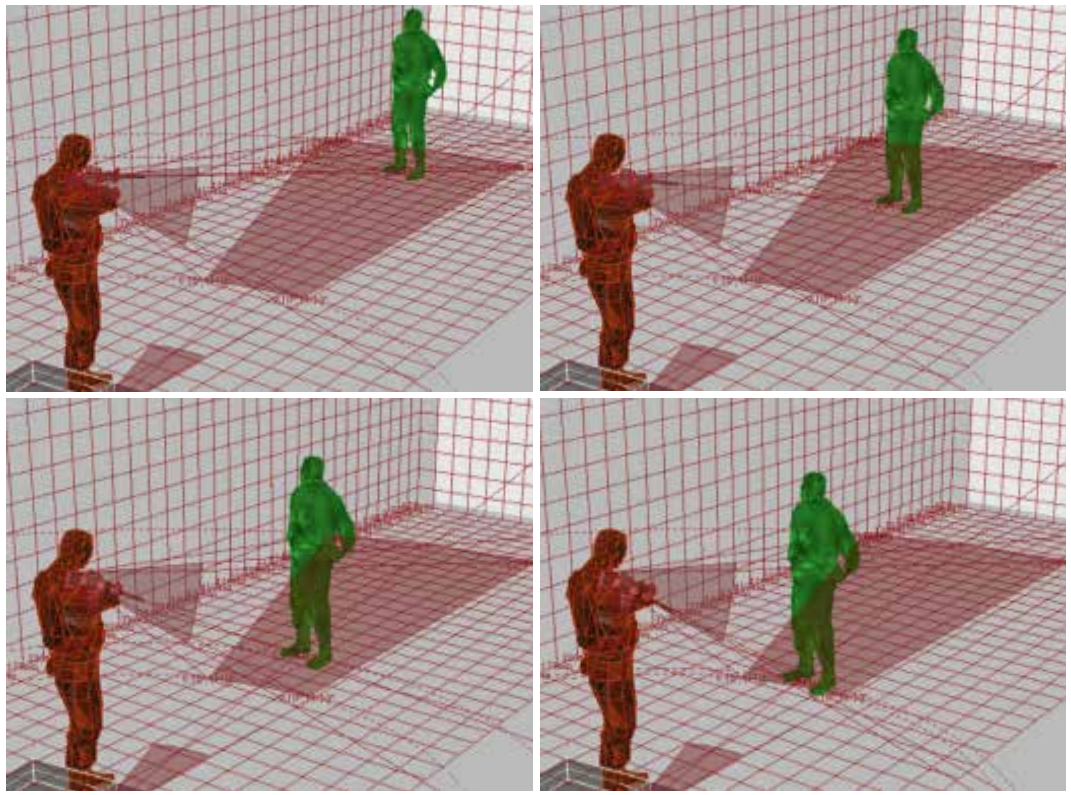
Fig. 16. An alternate axonometric view locating three possible locations of Abu Rahma on a 0.5 meter grid in relation to the known locations of the others at the scene. Visualization: Forensic Architecture and SITU Research.

The following diagrams and animations represent a portion of the analysis that was undertaken for this incident. It was ultimately not possible to achieve a level of accuracy sufficient to establish whether or not the soldier was aiming directly at Abu Rahma's feet. However, the research constitutes an illustrative example of the approach we term "video-to-space" analysis.[3]





Figs. 17–19. A still frame from Kanaan's video. An axonometric view of scene illustrating known positions of shooter and possible positions of detainee based on the video footage. The dashed lines connecting the plane of camera view with positions of D1, M3, and M4 serve as an axis along which the possible positions of the three individuals could be established. Visualizations: Forensic Architecture and SITU Research.



Figs. 20–23. Different possible relations between soldier and target.
Visualizations: Forensic Architecture and SITU Research.

On the last day of 2010, Bassem and Ashraf's sister, Jawaher Abu Rahma, died of cardiac arrest caused by inhalation of excessive amounts of tear gas while participating in another non-armed demonstration against the wall in Bil'in. The story of the Abu Rahma family is to a large extent the story of the way in which the Israeli military uses supposedly non-lethal munitions lethally to deal with non-armed protests in the West Bank, protests that pose a much more serious political challenge to the legitimacy of their rules than armed conflict. The Friday demonstrations of Israeli and Palestinian activists along the path of the separation wall continue nevertheless.

1 See Yesh Din (written by Yossi Gurvitz), "Escaping justice: Who killed Bassem Abu Rahme?", *+972*, September 12, 2013, http://972mag.com/escaping-justice-who-killed-bassem-abu-rahme/78780/.
2 See http://www.shovrimshtika.org/testimonies/database/635697 (in Hebrew), last accessed November 2013.
3 Another example of the use of "video-to-space" analysis can be found in Forensic Architecture's White Phosphorus investigation. See "Case: White Phosphorus" in this volume.

Forensic Architecture
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Legal Ruptures

A conversation with Michael Sfard

Edited transcription of a discussion with attorney Michael Sfard that took place during the "Devil's Advocates" PhD roundtable seminar at the Centre for Research Architecture, March 1–2, 2013. The seminar interrogated the relation between politics and legal activism. A video recording of the full conversation is available at http://www.forensic-architecture.org/seminars/devils-advocates/.

EYAL WEIZMAN Could you start by describing for us the daily reality of the legal cases that you engage in and dilemmas that you face as part of your work?

MICHAEL SFARD For the last decade I have been representing Israeli human rights and peace groups, Palestinian communities and individuals, and also many activists in the Israeli legal system. I've been representing communities and individuals who are under the oppressive system of domination—this has its toll and its share of dilemmas. The starting point is almost unnatural for a lawyer because one of the pillars or engines on which the Israeli oppressive occupation regime rests is the judicial system. I won't go into much detail because we don't have the time, but all the research, all the studies that have been made into the role of the Israeli High Court's jurisprudence in the Israeli domination of the West Bank have shown that the record of the court is such that there is almost no way to imagine the Israeli occupation lasting for five decades without the court's help. The court's help comes in different ways: of course the most natural one would be cases in which the court dismisses petitions filed on behalf of or by Palestinians and upholds different policies and practices that are implemented by the Israeli army in the West Bank and Gaza Strip. But it is not the only way that the court "prolongs the shelf life," as I put it, of the Israeli occupation. In the short run, some Palestinian successes in court—cases in which the court has declared a practice or a policy as illegal or unconstitutional—are a great success for the petitioners and are very practical in helping to stop some kinds of human rights abuses. But in the long run such successes make the regime more operable, more sustainable. When you take into account these two facts—that the Israeli court system, the Israeli justice system, is one of the axes upon which this regime rests, and that much of the litigation of these issues produces rulings and decisions which prolong the occupation—you have to ask yourself, well, should I go to court?

EW Can you tell us a little about your clients: why they choose you, and whether they face similar dilemmas?

MS None of my clients come to my office in Tel Aviv, because they don't have a permit to enter Israel or they are behind bars and they ask me to file a petition on their behalf. So they call me, because this olive grove is going to be uprooted for the sake of the separation fence; because a guy wants to be reunited with his wife who is abroad and cannot get in, because she went away for several years, to study, let's say, and lost her status as resident in the West Bank; because a client is being held in administrative detention and wants to have a judicial review, and so on. I can go on: for instance, a policy of assassinations—also known as targeted killings—is being implemented and people are being killed and a human rights organization asks me to file a petition and to lead a campaign against it. As a lawyer, and a human rights lawyer moreover, I am supposed to fight for my clients' rights; but as a political activist I'm asking myself should I do it or shouldn't I do it, given the record of the court—the danger is that I will only be a part of this system that prolongs what I see as an evil regime. And these questions are daily questions. I cannot say that every day I get up in the morning and ask myself whether to go to work or not, because I do go to work every morning and I do file petitions, but these dilemmas are not only hovering over my work but are also a subject for constant discussion with my colleagues, friends, and clients. I'm not planning on giving you a simple answer to this question, but I would like to make a few points that would enrich the discussion or even show you that it's even more complex than you thought.

While I have just mentioned the reasons why one should be deterred, as a human rights activist, from going to court in Israel, I should also mention why there is any incentive at all for the clients to go to court. The fact is that when we deal with individual rights, with litigation providing remedy to a specific individual, then I would have to concede and say that in some cases there is incentive, for two reasons. Firstly, the small number of cases in which there is a victory for the Palestinian cause or the fight against human rights abuse is actually won. There were several cases in the past years in which the litigation against the Israeli army or the Israeli government was successful and the ruling upheld the position of the petitioners. I can give an example: the torture case in which the Israel Supreme Court outlawed five forms of physical torture and made it clear that the general secret service cannot use these means in interrogations. Other cases were the separation barrier, or fence: I myself was involved in some of these cases and won three major cases, in which the court agreed that the route of the fence chosen was not a route that was designed to provide security to the state of Israel but rather to allow the expansion of settlements. The famous case of the village of Bil'in, for example, which yesterday celebrated eight years of struggle—well, four years ago we won the case. The court ordered the state to move the route and the village has retrieved about eight hundred dunams (a dunam is one thousand square meters) of their land. Of course I would also have to tell you that two thousand dunams were taken and only eight hundred were restored—nevertheless, these are still eight hundred dunams of cultivated olive groves. And so on. There are cases in which the cause that was presented on behalf of the disenfranchised, those who are the victims of human rights abuses, was successful. You can read about a very small number of these, which have been very well promoted by the court and translated into English on the court's website.[1] This is another issue: the court is using these cases as a public relations tool to show that the Israeli regime in the Occupied Palestinian Territories is not an arbitrary one—that there is a court, there is oversight, there is judicial review, and it is serious.

EW Are there any other types of successes within the process?

MS The second type of success is much larger in quantity. It's what the famous Israeli law professor David Kretzmer calls in his book *The Occupation of Justice*—which deals with Israeli court rulings in occupation-related matters—"successes in the shadow of the court." Which means that when someone files a petition, negotiations are something that can happen on the footsteps of the court, in the entrance to the court. Such partial successes are achieved many times. This is maybe the biggest success of litigation: many cases do not reach an oral hearing. In the case of those that do reach an oral hearing, just a remark or a comment made by one of the judges would convince the state to back off, or at least to back off partially.

Given the record, these two types of successes provide the oxygen, create the incentive to go to court. Here you have the two sides of the equation. First you have what I said at the beginning: that the law and case law is a major tool for domination that allows the Israeli authority to maintain this regime. And you have on the other side my description of successes in court, which are usually individual. I would like to put forward another issue here in terms of my own role. If I am a human rights lawyer—and I'm not just a human rights activist, I'm a lawyer—is it legitimate for me to tell someone, "You should sacrifice whatever chances you have of getting a remedy, because of the bigger picture, because of the fact that I have this legal-sociological analysis that takes priority in the more general sense"? Is it a legitimate demand from a lawyer, and, more than that, from a human rights lawyer? I may know that there are concessions I can get at this time, that I can save someone's olive grove. If I'm not a human rights attorney, if I'm a political activist, then maybe this is legitimate, because yes, as an activist, I'm not looking for salvation in an individual case, I'm looking to shorten the life of the occupation and bring an end to it, and as a political actor I understand that there are prices to be paid on the way to ending the occupation.

Let me give you a specific example with the case of the separation barrier. The seam zone—the area between the separation fence and the green line—was originally supposed to follow a route which was composed of more than 20 percent of the West Bank. Litigation, successes in court, and some diplomatic pressure changed the route. The route went through

a significant diet and today the route cuts off 9 percent of the West Bank. This 9 percent affects one hundred villages and hundreds of thousands of people. There's a permit system that is supposed to manage the entrance and exit of Palestinian villagers to the seam zone, and there are tens of thousands of people who are supposed to get permits—or to be declined them; it is a big bureaucratic system. Just try to imagine that no cases were filed against the route of the fence and that the seam zone was composed of more than 20 percent of the West Bank with millions of people affected, not hundreds of thousands, and thousands of villages, not a hundred. Would it be manageable? How monstrous would it be? There's no question that it would be horrendous, that it would be much more damaging to many more people than it is today. We can even measure the benefit of going to court in pieces of land and the livelihood of people. But we can also say that, as a lawyer who was litigating the cases of the barrier, I am now one of the architects of the fence.[2] There are specific areas where one segment or an other was rerouted as a result of my litigations. In the framework of these litigations, we can say, on the one hand we saved the livelihoods of many people; on the other hand, we gave legitimatization to the idea of the fence and permit system that invades the West Bank. I have been channeled—if I wanted to be successful in court I had to be channeled—to speak about security, to be part of the security narrative. I was also saying that this was not for security, but admitting that a different, much better route is probably more affected by genuine security considerations, and so on. Also, as I said before, there are public and political implications to such an approach: people in many circles in Israeli society who would probably not be able to live with some degree of human rights abuse are sleeping well at night due to the fact that they have confidence in the fact that the wise men and women in robes in the Supreme Court in Jerusalem don't allow Israel to get completely crazy. These cases allow the court and these parts of the Israeli public to retain the composure and the state of mind that there we're on it.

EW Can we follow on with another question that would perhaps connect to the discussion that we had in our "Devil's Advocates" seminar on the legal approach of Jacques Vergès, and in particular on what he calls the "strategy of rupture"?[3] I don't know if you would accept this proposition, but here it seems to me you are putting together two separate claims: one, that we cannot sacrifice the individual for the larger political claims that could be made; and the other that, in the "shadow of the court," the state or the military must change significantly its actions towards the entire population—not the individual. Perhaps there is another way to think about the politics of legal action: yesterday Emilio Christodoulis discussed Vergès's "rupture" technique, and I just wondered if this was something that you are thinking about too. His was not the question of whether or not to accept a commission from a client; rather, the understanding was that the court was part of the colonial system he was seeking to expose—as in his famous defense of Djamila Bouhired,[4] during which he attempted to expose the French colonial system itself as criminal. So for him the question was how to make a statement, what to say, how to use the court as a public platform, how to find what Christodoulis was calling an "immanent critique"—a sort of bringing forth or showing of the contradictions inherent within the system in order to expose its hypocrisy. So perhaps everything that you've just said now about the dilemmas you face could be included in a form of immanent practice, in terms of the way in which you make a case or claim and the language you introduce to the court in making things public. So what I'm saying is that there might be an excess in relation to the case itself which could be mobilized in some way.

EITAN DIAMOND You represent both individuals and NGOs, and those NGOs and organizations don't usually go to court to defend particular individuals' interests but rather to address broader problems. Often my impression is that there is no expectation that the legal proceedings will yield a victory in court; rather, the purpose is to place this issue in that forum and generate public discourse around it, to expose it, perhaps to embarrass everybody in the system by exposing an issue.

MS Yes, this was my next point. I presented a dilemma assuming that there is a clash between the interests of the specific client—an individual or community—and the political strategy. I completely agree that this clash can be not only mitigated but also that by choosing the right legal strategies, narratives, language, and public opinion around the case, and through the right framing of the case, one can divert the vectors of the individual interest and the political strategy so that they will point in the same direction. Maybe we can talk about this instead in terms of what I described before: the danger of becoming a member in a joint venture with the authorities. That is the biggest nightmare: that you are trying to do something for your clients and you provide assistance to the authorities in, for example, creating a better system that is more sustainable, like the wall, etc. Instead of this, I do accept and adopt the idea of litigation as a rupture; and yes, Eitan, you are completely right that the biggest flexibility we have is when the cases are with NGOs, because NGOs can choose their cases—it's not like a walk-in clinic, they can build their whole strategy around it.

The example I would like to raise is the example of Peace Now, which is the largest Israeli peace group, and this group's legal campaigns for the dismantling and evacuation of unauthorized outposts that were erected in the last decade by settlers in the West Bank. Unlike the ordinary settlements that have been erected by the government these outposts were erected without the government's official permission. Many of them have been created on

private Palestinian land. For many years, the government of Israel was saying one thing and doing another: outwardly it was constantly saying that these outposts are illegal and the builders of the outposts are outlaws, and promising time and again to the American administration and to others that it would deal with at least some of the outposts; but in practice it did nothing about it. We thought this was a very good subject for litigation for many reasons: first of all, we can exploit the courtroom as the only place where the government closes the gap between its words and deeds. They can say things in the media but that doesn't compel them to do anything, especially if the Israeli public doesn't care. And they can also not say anything, which in many cases was the issue. The government did not say whether it sees a specific outpost as legal or illegal. In court they are compelled to take a position, and then—in theory—it is quite easy to compel the government to act in accordance with the position it took. The court is the only place where you can do this. Politically I think it was a brilliant idea that the government, which through the years was desperately trying to avoid any confrontation with the settlers, was suddenly confronted with them. And also it was, I think, very smart because it was a win-win situation: if you win in court, or if you secure the evacuation of these outposts, it's a big victory in the sense that the government will have to get into a clash with the settlers and return specific land to its rightful owners. And if in the scenario they don't do it then you uncover the fact that Israel is only talking, declaring its loyalty to the idea of the rule of law and the idea that Palestinian property must be protected, when in fact there is no rule of law on Israeli settlers and the property rights of Palestinians mean nothing. So the legal strategy was using some of the traits of the litigation profession in order to create embarrassment, to strengthen the clash between the government and the settlers, to bring about—coercively—a legally binding position of the government.

We have a stream of cases of this sort, and it has proved very effective when an issue that was a nonissue became one of the major political problems for the government in the last few years. Two outposts were already evacuated through court cases and this whole thing has meant that this is the first time that the Israeli public has been discussing the settlement enterprise, the fact that it violates property rights of Palestinians, and the price that we as a society are paying for that. And that's why I think this was a major success.

Going back to the "strategy of rupture" and the possibility of calling into question the jurisdiction of the court, I think it's worth pointing out that because in my case I am the lawyer for the petitioner of the judiciary, I am the one who goes to court, I don't go to court and then tell them, "actually you're not a legitimate instance." There were many cases in Israeli courts, especially military courts, where the defendants resorted to such a line of argument: that the court is illegitimate, that it operates outside the boundaries of international law and morality. But I have to say that I haven't seen, in Israeli cases at least, any significant implication of such strategy.

NICOLA PERUGINI It seems to me that the problem is in this separation that you were making at the beginning between the people and the collective. I think the challenge is about how to think every single case as a collective political claim. What was surprising to me was accepting this idea that in any given case when I go to court it's the individual, the singularity, that's at stake. One of the logics you were describing at the beginning of the occupation was precisely in the direction of individuating and breaking the collective, so the challenge is how to give the cases a collective dimension.

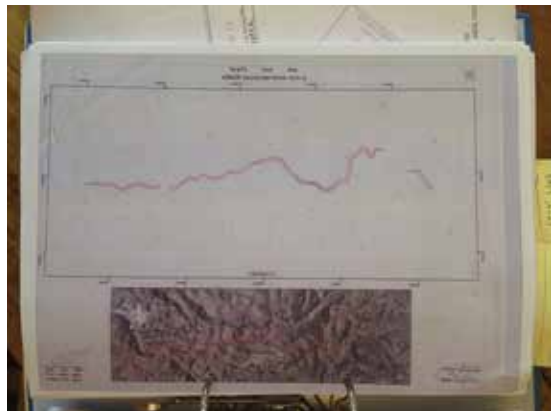
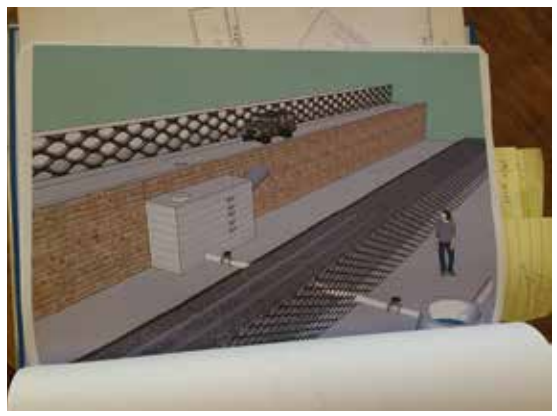
MS We are engaged in two completely different types of litigations and they play a completely different role. One is the individual human rights case in which a specific abuse is being targeted in order to provide a remedy and help a specific individual, family, or community. The other is the more politicized, strategized litigation that is part of a whole parcel of campaigns in the media: public, political, and so on. These are two different creatures, but I urge you not to give away the first one. When I say individuals I don't mean one person—it can be a community, but it's still an individual case, a specific case in which you are not aspiring to get a political effect from that case. Take the situation of the communities in South Mount Hebron, the southern part of the West Bank, where Israel has for the last few years been trying to displace the communities—it's a very sparsely populated area and Israel has the intention to take over that area. In order to do that Israel is trying to displace the communities there. So sometimes the individual case regarding the water cistern, or the demolition orders that were issued against the houses that were built by the community, are the barrier between the state and eradicating the community.



Fig. 1. Cultivation on the ancient terraces on the western slopes of the village of Battir, 2009. Photo: Federico Busonero/UNESCO.





Figs. 2–7. Selection of visualizations submitted by the Ministry of Defense to the High Court of Justice in support of their case. Courtesy of Michael Sfard, 2013.

The Landscape of Battir vs. The State of Israel

The Palestinian village of Battir is located south of Jerusalem, just east of the 1948 Green Line and the still operative Ottoman-era Jaffa-to-Jerusalem railway line, access to which is forbidden to West Bank Palestinians such as the residents of Battir. Between the village and the railway Israel is planning to build a new segment of its separation wall.

The village preserves agricultural practices that have been maintained for four thousand years using a unique irrigation method. It is of striking beauty and there have been plans—for the moment unfortunately delayed—for it to be submitted by the Palestinian Authority (PA) on behalf of Palestine for recognition by UNESCO as a cultural heritage site. It was included on Palestine's tentative list of world heritage sites. UNESCO was the first international agency that recognized Palestine as a state, opening the floor for the PA to propose the introduction of other parts of Palestinian landscape into the World Heritage list. The potential nomination to the World Heritage List played a role in the villagers' petition against the wall in the Israeli High Court of Justice. The wall, whose declared purpose is to defend Israel proper and the train line to Jerusalem, so the petition claimed, is likely to destroy some of the site and disrupt the historical terrace system there.

The case brought together a coalition of petitioners concerned with the case in different ways. These include the Palestinian villagers, represented by attorney Ghiath Nasser and the environmental NGO Friends of the Earth Middle East (FoEME), represented by Michael Sfard. The Israeli Nature and Parks Authority was named in FoEME's petition as one of the respondents, a step which proved to be important as the Authority objected to the military's position and urged the court not to allow the destruction of the site, where agriculture is being practiced using biblical methods. This is how the Israeli newspaper The *Jerusalem Post* described one of the court sessions in December 2012 and the unusual convergences between ideologically and politically diverging actors:

> On one side of the courtroom before the High Court of Justice on Wednesday was the state attorney and a colonel from the [Isreali Defense Force's] Civil Administration of Judea and Samaria. On the other side were the villagers of Battir, the Friends of the Earth Middle East (FOEME) and, surprisingly, the Israel Nature and Parks Authority. That's right – the state was arguing with itself, with an unprecedented defection by the Authority joining the fight against a new extension of the West Bank barrier through the well-known Battir cultural site.[5]

What is interesting in the case is the central place that visual forensics and aesthetics have played in the deliberations before the court. The state insisted that it will design a wall that will create minimal visual disruption to the site and the petitioners have sought to highlight that the separation wall will in fact have a devastating effect on the appearance of the site and its sustainability. Both parties have submitted visual presentations to the court to illustrate what the landscape will look like once the wall is constructed. Analysis of such imagery has also formed a central part of the parties' efforts to persuade the court to adopt their respective arguments about the likely outcome of the construction of a separation wall in the area. Much of the proceedings therefore revolve around these visual representations. Indeed, they will probably be crucial to the eventual outcome (the court has issued a conditional order and is supposed to convene for a last oral hearing in January 2014).

Forensic Architecture, which has for this investigation commissioned the participation of Nicola Perugini and Samir Harb—who have worked on the UNESCO project—provided the village council and human rights lawyer Michael Sfard, who represented the environmental NGO FOEME, with visual tools in a petition to the Israeli High Court of Justice.[6] This legal action aims at stopping the construction of the wall in the area. Among the interventions produced by Forensic Architecture was a digital model and animation representing the effects of the wall—both as an iron fence and as a concrete structure—on the environment and showing that even the most "architecturally sustainable" and "less invasive" routes proposed by the Israeli army would provoke irreparable visual and environmental harm to Battir and the surrounding areas.




Figs. 8, 9. Advocate Emily Schaeffer presents the Battir file with computer renderings by Forensic Architecture.



EW I think that sometimes what we call the individual becomes a political figure, which is an exemplar for a larger situation. I think this relates to the question of excess. And I think that can lead us to a unique opportunity—that is, a case you have been pursuing on behalf of Friends of the Earth, which concerns the village of Battir, a very ancient village on the edge of the Occupied Territories next to the Green Line—where a kind of a new strategy has emerged. I think that this case exemplifies a certain potential for making a larger claim through a specific moment. So maybe we can end the conversation with this. But before you respond, it's worth giving a summary of the case.

Fig. 10. Ministry of Defense illustration of the wall in the area of Battir. State lawyers attempted to show that the wall would be inoffensive and even cladded it with local stone. One of the tasks of Forensic Architecture was to demonstrate that the illustration was manipulative. Indeed the measurements noted on the left part of the wall are derived from a building behind it without taking account of perspectival shrinkage.

MS There's even an update which you are not aware of yet which shows exactly how such cases can expose things and embarrass the government. This is another case in which I challenged the legality of a segment of the route of the separation fence. The uniqueness of the case is that, unlike most cases that deal with the route of the fence, the central issue is not security versus the rights of the adjacent community. If the route of the fence is implemented, the village of Battir will suffer; but when you compare it to other villages along the route of the separation fence, it will not be one of the villages that suffer so much. They will lose a few dozen dunams of land but—and I'm not belittling it—in comparison to other villages this is really very little. But this case deals with another issue which other cases did not: the fact that the route goes through one of the most ancient cultivated lands in the region where terraces that were in use without interruption for the last four thousand years are still in use, and the agricultural techniques that were in use during biblical times are being followed to this day. It is a very unique area with a historical form of terrace cultivation and water springs.

The route that would cut through the site would destroy it because it would be impossible to cultivate the land beyond the fence, since the passage from one side to the other would not be free. One of the reasons the site is eligible for a World Heritage site is because it is undisturbed, it is a continuous area of this special type of agriculture. The reason that the route was designed to go through the site is that for the last hundred years there has been a train track going through the site, from the times of the Ottoman period, and the Ministry of Defense argues that in order to defend the track there is a need for the fence to be adjacent to the track. If our position would be accepted—that the fence should not be installed—then there would be no barrier for those who seek to damage the track. I won't get into details, I'll just say that the fact that there is a potential that the site will receive UNESCO's World Heritage site status is, shockingly, a very persuasive reason not to allow the route to be constructed.

In the recent brief that we filed we included the work that was done by Forensic Architecture in which you created a map of the area that shows how the site would look if there was a fence installed in it, and also a video that shows how arriving on the train would look once the fence was installed—in short, that proves to the judges that the fence would be horrendous and would damage the site to a very large degree. We wrote in the brief that if the state maintains its position that there is no way to guard the train tracks without a physical barrier then it is our solution, or suggestion, that the train would cease to operate. The train from Tel Aviv to Jerusalem serves nothing but a touristic aim and in four or five years there will be a new, fast train to Jerusalem. And here is the update or exposure: yesterday the state issued their brief, and this shows how ignorant they are. They said, well, the petitioners' suggestion that we'll stop the train is in fact an attempt to disrupt regular daily life and this we cannot accept. This is the state that has built five hundred kilometers of fence, separated thousands of people from their land, cut off dozens of roads—there are entire villages that were disconnected from their municipal area and reconnected to a different city just because of the fence. So I think that beginning next week we will make a huge fuss about this position. And this is how cases like this can expose the absurdity of the state position.

EW I think this is such a good point to end, because it leaves us with a few good paradoxes. The first is that when you depart from this human rights argument and adopt another frame—in this case territorial and archaeological—then the political effect could be much larger. The second thing is that you are able, through this case, to invert the role of Israelis and Palestinians—now that it is Israeli life that is disturbed—and to expose that contradiction. And the third thing, which is something that I think is precious in the way that the case has been run, is that there is no proposal for a "lesser evil wall" here. In fact, your claim is that no wall in that area is possible. And I think that by refuting the very possibility or acceptability of a wall in a particular position—and this might be another reflection on the relation between the particular and the general—you are putting into question the entire politics of separation.



Figs. 11, 12. Digital model view of the separation wall and its impact on the landscape seen from a train carriage. Visualization: Samir Harb, Juan P. Brockhaus/Forensic Architecture.

MS The whole wall, absolutely.

1 Not all cases are translated into English.
2 See Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2011), 78–80.
3 See Jacques Vergès, *De la stratégie judiciare* (Paris: Éditions Minuit, 1968).
4 Djamila Bouhired was an Algerian nationalist who opposed the French colonial rule and was tried in 1957 for allegedly bombing a café and killing eleven civilians.
5 Jonah Jeremy Bob, "Analysis: The wall in the court room,' *The Jerusalem Post*, December 13, 2012.
6 For further information regarding Forensic Architecture's involvement, see http://www.forensic-architecture.org/investigations/the-landscape-of-battir-vs-the-state-of-israel-2/.

BEFORE AND AFTER
Ines Weizman and Eyal Weizman

Before and after photographs are the embodiment of a forensic time. They frame a missing event by showing the states that preceded and succeeded it. Before and after images emerged out of the limitations of the early photographic process. The duration of a few dozen seconds required for the exposure of a mid-nineteenth-century photograph was too long to record moving figures and abrupt events. The result was that most often people were missing from the image; only buildings and other elements of the urban fabric were registered. To capture an event, two photographs were necessary. The technique was thus useful in representing the consequences of urban conflicts, revolutionary action, and large-scale urban reconstructions. In before and after photographs, the event—whether natural, man-made, or an entanglement of both—is missing. Instead, it is captured in the transformation of space.

The fact that what is crucial in before and after images is the gap between them, the missing event, has two key implications for those using such photographs to study the results of violence: first, there is an imperative to shift attention from the figure (the individual or action) to the ground (the urban fabric or landscape); and second, these gaps mean that the analysis of any pair must always be supplemented by additional information and interpretation. The gap between before and after images might thus be considered as a reservoir of imagined images and possible histories.

This photo essay is an extract from Ines Weizman and Eyal Weizman, *Before and After* (Moscow: Strelka Press, 2014), in which the images are arranged in a longer sequence and supplemented with a more historical and interpretative reading.

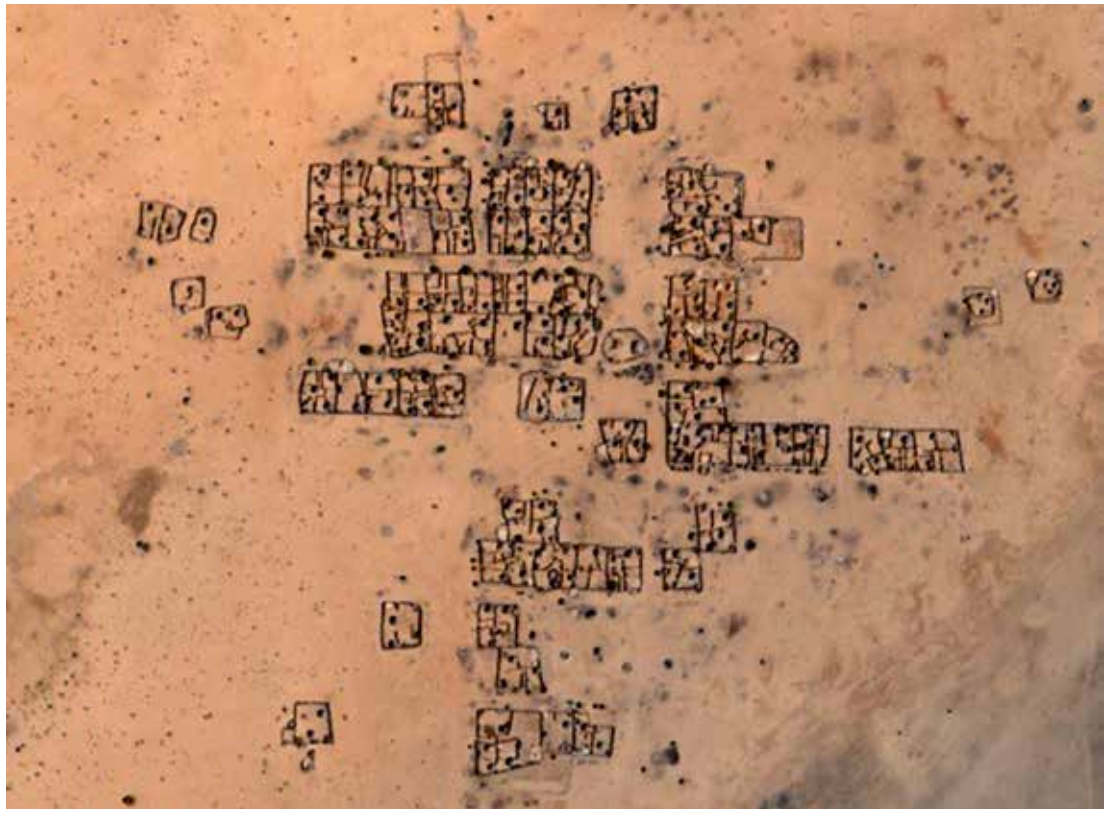


Perhaps the earliest before and after photographs of an urban scene are a pair of daguerreotypes of the barricade in Paris's Rue Saint-Maur-Popincourt. These were captured by Eugène Thibault from a hidden window, before and after a clash between workers and the National Guard, led by General Lamoricière, on Sunday, June 25, 1848. The historian of photography Marie Warner Marien has described the scene unfolding in this pair.[1] The "before" image shows a sequence of two or three barricades that appear to have been assembled out of sandbags and cobblestones. Although the workers' neighborhoods of the time were undergoing an unprecedented population explosion, we can see no one in the street and no one manning the barricade. Are they hiding or are they moving too fast to be captured by the camera? The "after" image is blurry. The National Guard seems to have broken through. Artillery and other military equipment have been positioned in the area previously held by the defenders. The workers were defeated, killed in battle, captured, or executed, but the violence and confusion of the battle are missing from these images. When printed in August 1848 in the reactionary (and, later, collaborationist) Parisian weekly *L'Illustration,* they were meant to convey the state's warning to the workers: this will be your fate if you rebel!

Even the presentation of this most minimal of sequences —composed of only two images—calls to mind other cultural forms and human experiences. First, it made imaginable the possibility of moving images, a decade before the movie was invented. In this context it could also be understood as a kind of very early montage: a form of construction in which images are commented upon, not by words, but by other images. Second, in this pairing, as in all before and after photographs, the absence of the event from representation might be seen as analogous to the effects of trauma on memory. Psychological trauma erases or represses precisely those events that were hardest for the subject to experience, and these gaps forever keep any recollection incomplete and indeterminate. Contemporary legal theory now treats these memory lacunae as evidence in their own right—the very act of erasure is evidence of the trauma suffered by the subject. The gap between before and after images might similarly be considered as a reservoir of imagined images and possible histories, and keeps the pair open to future interpretations.



Eugène Thibault, *The Barricade in rue Saint-Maur-Popincourt before and after the attack by General Lamoricière's troops*. June 25 and 26, 1848. Daguerrotypes. Source: Musée d'Orsay / Réunion des Musées Nationaux.

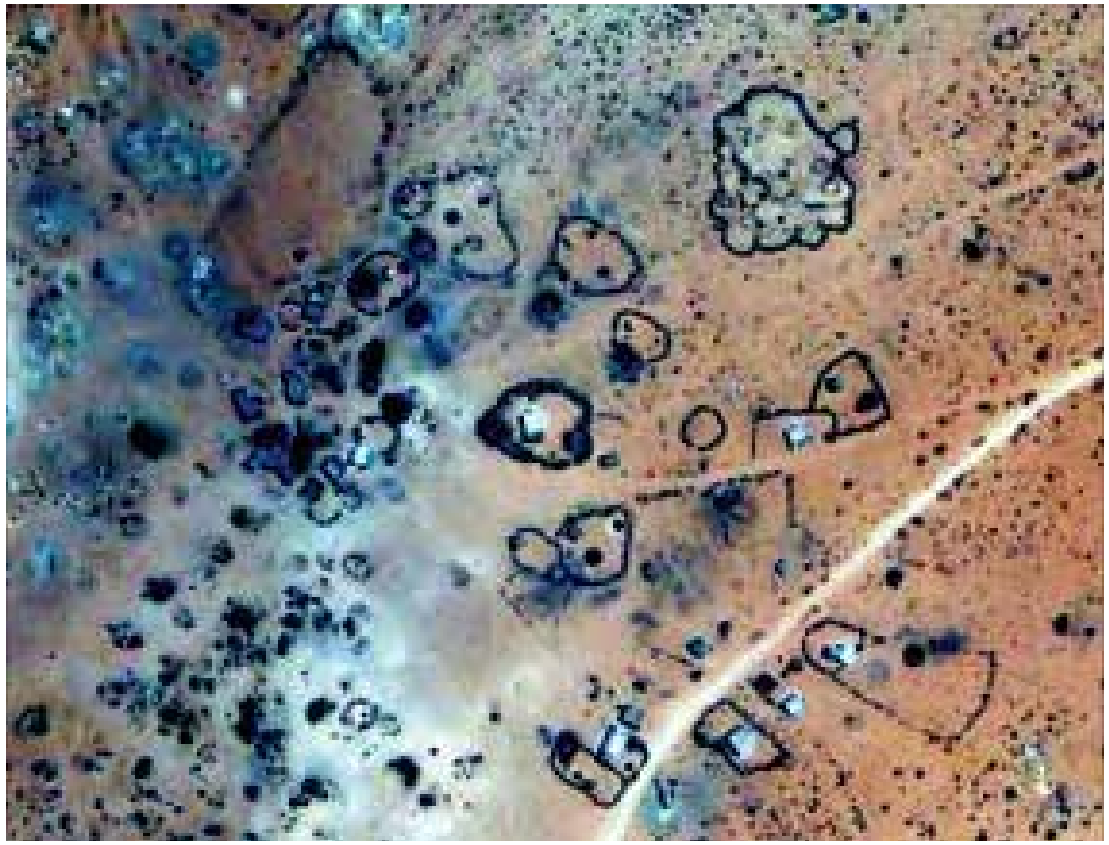




Today, the most common before and after images are satellite photographs, and they are once again the product of a limitation in the photographic process. The orbit times of satellites circumnavigating the planet means that they can only capture the same place at regular intervals. Because there is a time lag between each image (the fastest satellites can orbit the earth every ninety minutes, but at higher altitudes they take several hours), the events are often missed. In addition, international regulations currently limit the resolution of publicly available satellite imagery to 50 cm per pixel. Half a meter square is the frame within which the human body fits when seen from above. Whether motivated by security considerations or by privacy laws, the fact is that the limitation on resolution means that, 150 years after the invention of photography, the original problem persists: the human figure and events are dissolved into the ground.[2]

When crisis occurs, or is expected, commercial image satellites align their orbits to cover "regions of interest" or "areas at risk" in the hope of selling their images.[3] The images are mainly interpreted by for-hire professional analysts who create before and after pairs and perform a skilled version of a "spot the difference" game. In order to create a photographic juxtaposition of before and after images, analysts must obtain each of the photographs through a different procurement process.[4] The "before" photographs, as close in time as possible to the event, are usually retrieved from existing archives of satellite companies. For the "after" image, the analyst must either "task" a satellite—which involves the expensive navigation of a satellite over a specific location—or chose the cheaper option of "cherry-picking" an existing image, if a photograph dated close enough after the event exists in the satellite company's image bank.

Damage to a village to the east of Shangil Tobay, North Darfur, Sudan. March 10, 2003 and December 18, 2006. © DigitalGlobe. Original source: AAAS, *High-Resolution Satellite Imagery and the Conflict in Chad and Sudan*, http://www.aaas.org/ZzU.

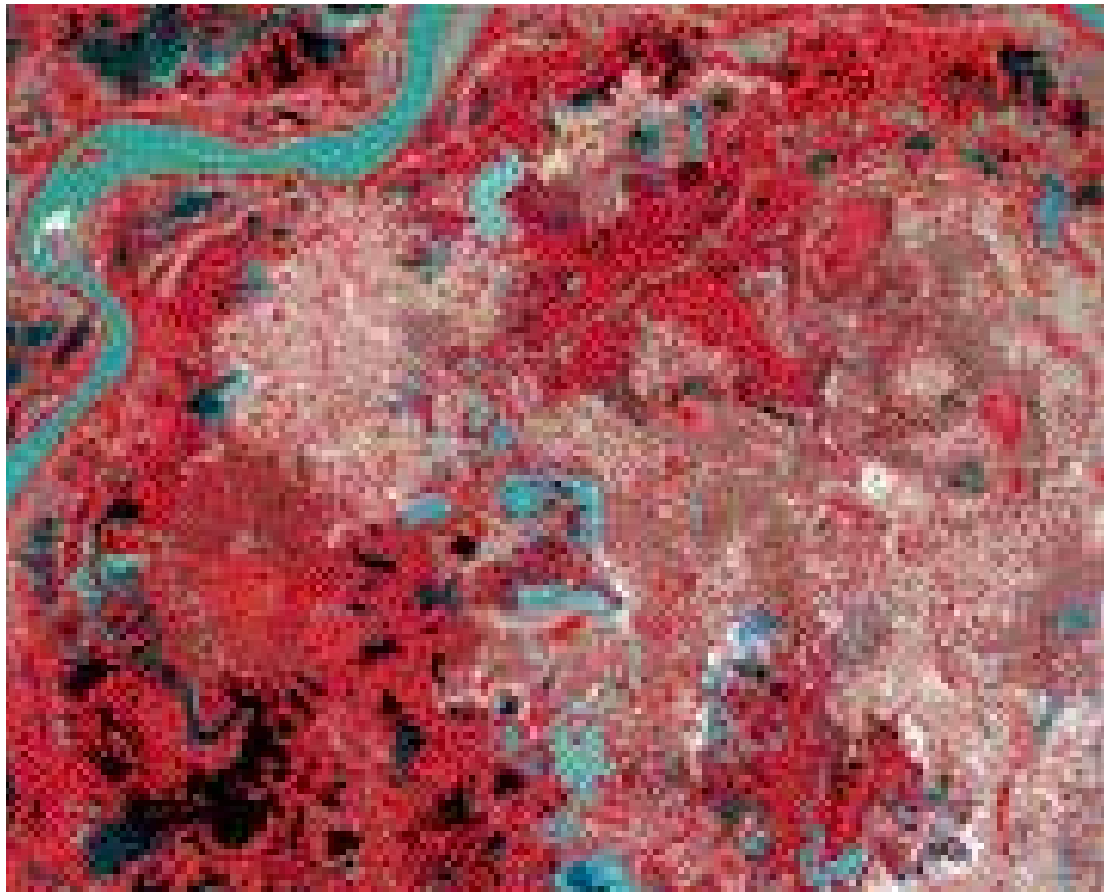




In the analysis of the juxtaposition, the "before" image is used as the baseline—the normal or normative state from which later events are interpreted as deviations. The further apart in time the images are, the greater the margin of error, the more numerous the events that could be implicated in the new state.

The fact that human rights groups rarely have the resources to task a satellite, and instead have to pick from existing images, imposes a considerable limitation on their work. Generally they can only afford to interpret satellite images of those places that are already being monitored by well-funded institutions or corporations. This makes NGOs dependent on the tangled interests of militaries, states, and large international organizations.[5]

Uubatale, Ogaden region, Ethiopia. Before and after destruction by the Ethiopian army. August 24, 2003 and February 21, 2008. © DigitalGlobe. Original source: AAAS, *High-Resolution Satellite Imagery and the Conflict in Ogaden, Ethiopia*, http://www.aaas.org/ZK8.



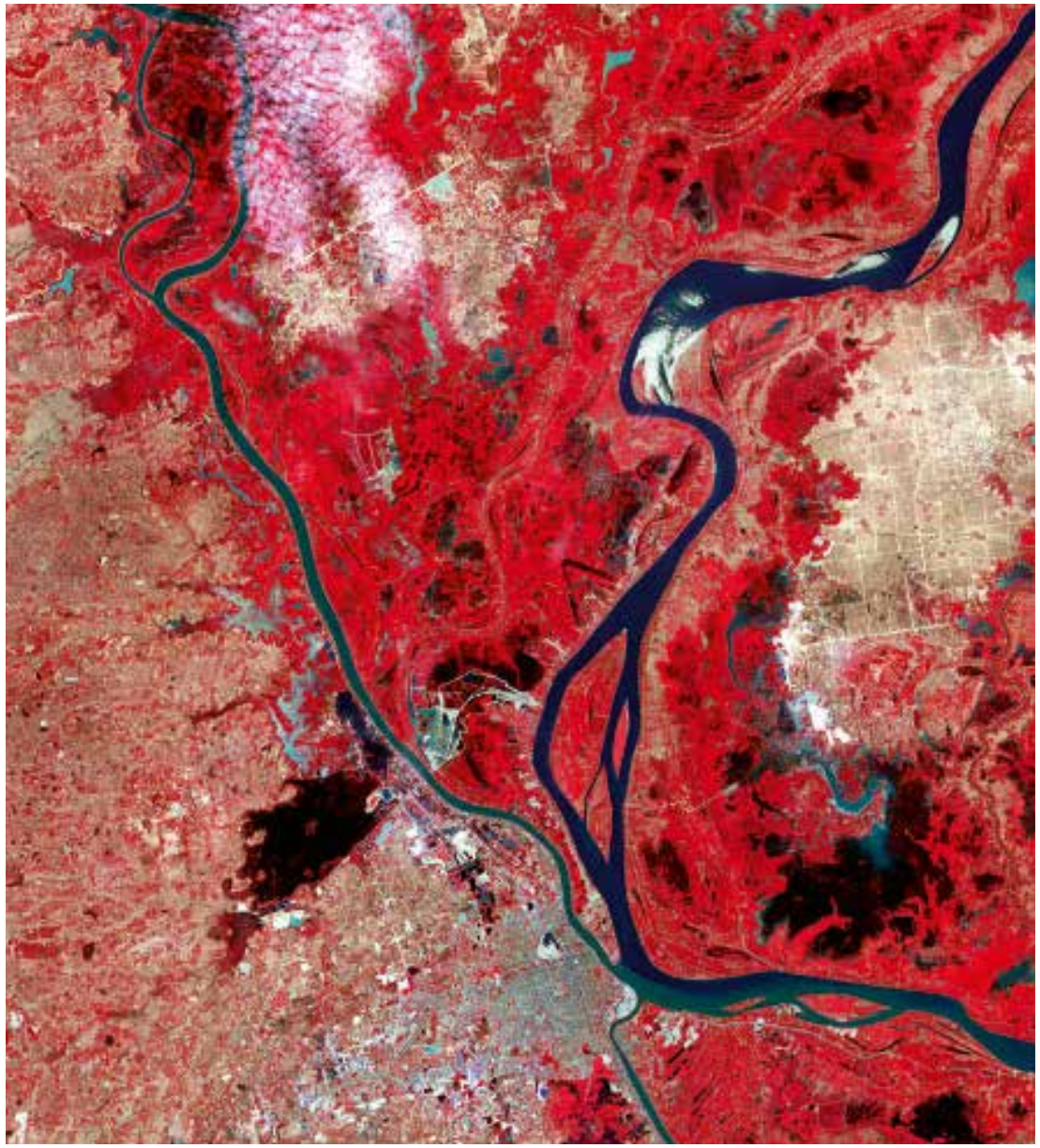


The history of Cambodia over the past forty years, as captured by American land observation satellite (LANDSAT), demonstrates the complexity of the entanglement of environmental transformations and conflict. In January 1973, less than five months after Landsat 1 reached orbit, the first detailed photographic survey of Cambodia was undertaken from outer space. That year also saw the culmination of an escalating campaign of "secret" bombing unleashed by the Nixon administration. Almost three million tons of bombs were dropped on Cambodia between 1965 and 1973, around double the total number dropped on Germany during World War II. Approximately two million refugees were forced from the countryside in to cities; about a million of those crowded into Phnom Penh. The carpet bombing ravaged villages, fields and forests, upturning the surface of the earth. The shifting of the topography affected the hydrological cycle, rerouted waterways, and created swamps.

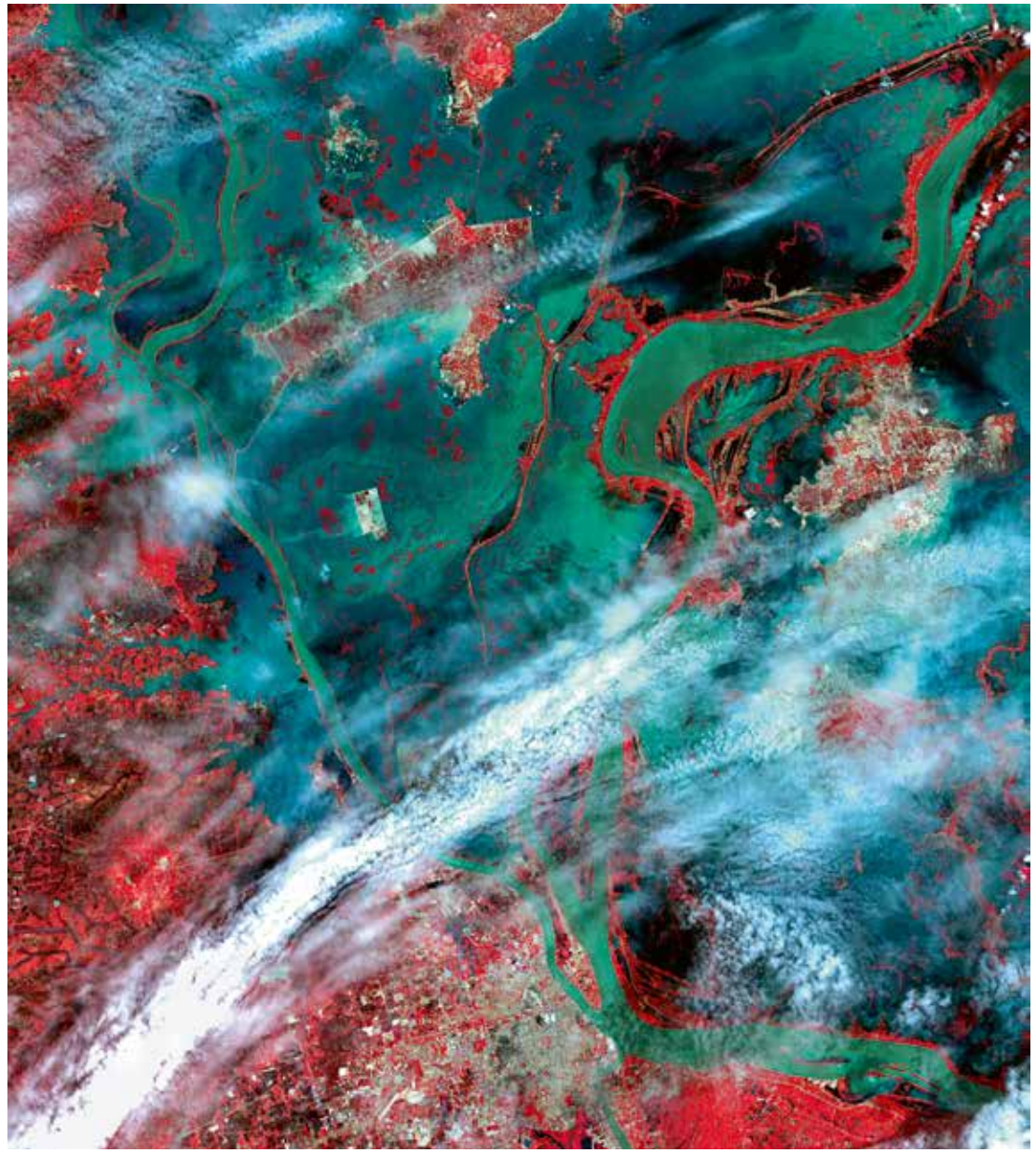
However, the 1973 image became known not for what it showed but rather for providing the "before" image—the supposedly neutral baseline—against which another crime would be registered: the atrocities sometimes referred to as the "autogenocide" perpetrated by Pol Pot's Khmer Rouge regime on this very ravaged terrain. A satellite survey undertaken in 1985, six years after the Khmer Rouge regime was eliminated by communist Vietnamese forces, shows another massive transformation of the surface of the earth: a strange grid etched on the surface. This was achieved not by bombs but by the labor of an enslaved population that was moved out of the cities for the purpose of excavating massive irrigation systems, canals, ditches, and dikes. They were dug along the one-kilometer- square gridlines that had been drawn for orientation on the Chinese military maps used by the Khmer Rouge. On the basis of this irrigation system, the regime could plan for the ruralization of the state and the foundation of a sustainable agrarian utopia.[6] This massive project—explained in Maoist rhetoric as "The Super Great Leap Forward"—was the site of the Killing Fields.

The 1973 and 1985 satellite images thus represent the consequence of a compounded atrocity, inflicted first on Cambodia by the US Air Force and later by the Khmer Rouge, throughout the period that the Finnish Inquiry Commission of the time termed the "Decade of Genocide."[7] Of the two events, the US bombing is the less-represented episode of Cambodian history. Despite being registered on the 1973 Landsat photograph, there was no "before" image with which to compare it.[8]

North East of Phnom Penh, Cambodia. These are false color images in which red represents vegetation. Visible in the after image is an orthogonal grid of canals. January 3, 1973, Landsat 1 (path/row 135/52); and December 14, 1985, Landsat 5 (path/row 126/52). Courtesy of US Geological Survey.

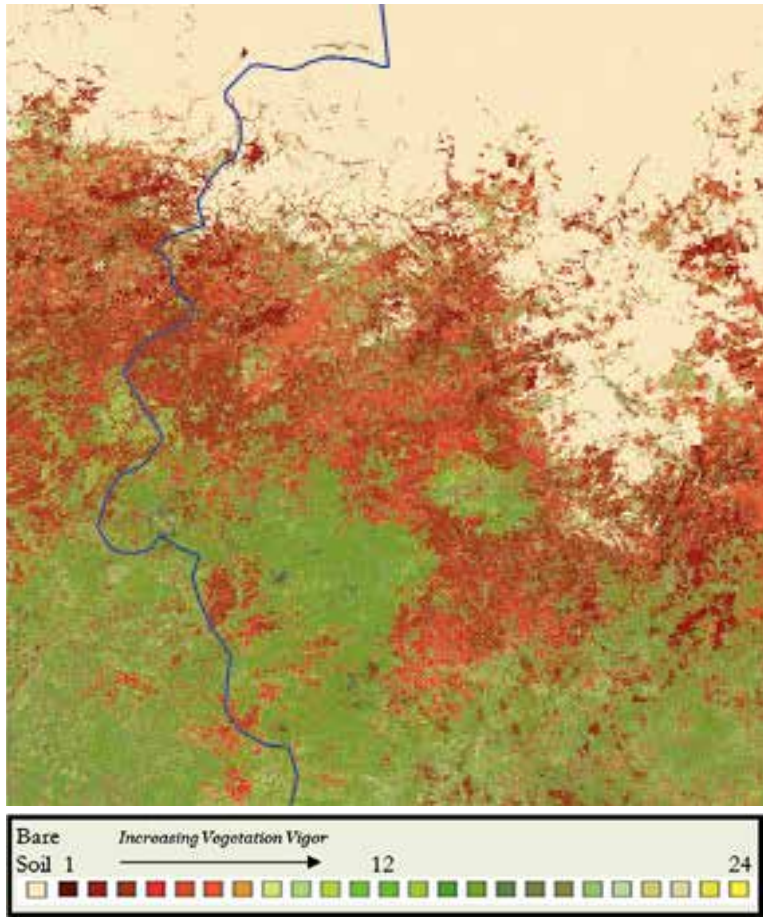


The area near Phnom Penh, Cambodia, before and after massive flooding. February 25, 1995 and January 14, 2009. Landsat 5 (path/row 126/52). Courtesy of US Geological Survey.



The third major force of destruction that has been inflicted on Cambodia is climate change. Contemporary Landsat surveys of Cambodia show that the Khmer Rouge irrigation system is not only in good operational order but that it has, in fact, been expanded. This was done with the aid of the World Bank and other international institutions, and has accounted for increased land productivity and self-sufficiency in Cambodia. But extensive as the system has become, it has not been able to handle the increased frequency and severity of the monsoon floods that have come about through climate change. Cambodia is one of the countries contributing least to climate change but paying the highest price for it. In 2011, the worst flood in Cambodia's recorded history saw three-quarters of its land area inundated and about eighty percent of the harvest destroyed.

The case of Cambodia demands a shift in the frame of analysis, from a notion of human rights in relation to the acts of repressive regimes, towards a conception of rights that combines conflict studies with environmental issues. This concern has been named, by both militaries and human rights groups, *environmental security.*

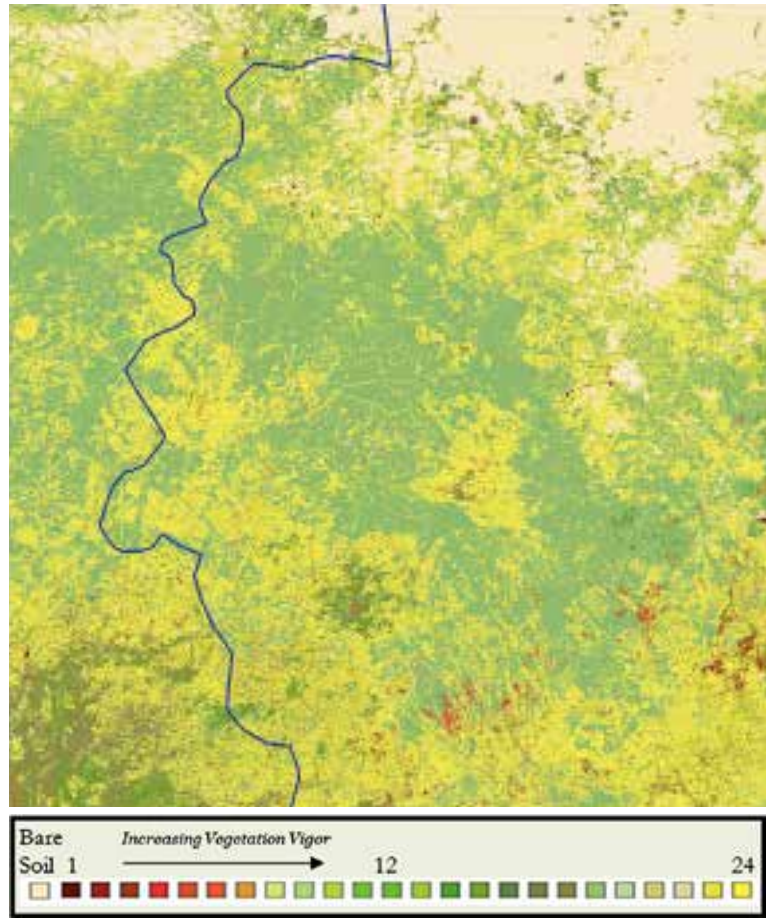


Darfur, Sudan. Normalized Difference Vegetation Index (NDVI) showing the increasing vigor of (predominantly) grasses and shrubs between 2003 and 2007. © Russell F. Schimmer. Original source: Russell F. Schimmer, "Tracking the Genocide in Darfur: Population Displacement as Recorded by Remote Sensing," *Genocide Studies Program*, Working Paper no. 36, Yale University, 2008.

The case of Darfur, Sudan, is another example that can help demonstrate the entanglement of conflict and environmental transformations. According to the UN, one of the reasons for the conflict in Darfur was a reduction of the extent of available pastoral land, due to the desertification of the Sahel, itself a consequence of human-generated climate change. The tension that existed between groups divided along cultural, ethnic, and religious lines was aggravated by the competition over a shrinking area of land. But the transformation of the environment was not only a cause, but also a result of the conflict. In agrarian areas, such as those found in parts of Darfur, where the conflict led to large-scale massacres and ethnic cleansing, cultivated fields have fallen fallow in the absence of their masters.

Studying the transformation of the natural environment in Darfur, the Yale University Genocide Studies Program, which engages with the interpretation of satellite imagery to help expose and verify claims for genocide around the world, employed a satellite-borne technology called Normalized Difference Vegetation Index analysis (NDVI). NDVI is a graphical indicator that is used to visualize the vigor of vegetation cover. When two or more satellite photographs are juxtaposed or superimposed, the NDVI data can demonstrate changes in the natural environment between the dates of capture. Each pixel on the image has a color on a scale that indicates whether the area within the pixel lost or gained vegetation cover.

Cultivated fields have a single plant species spread more or less evenly and therefore display a great degree of coherence in terms of heat emission. Several years after being abandoned, fields display a more random distribution of plant varieties, representing the robust return of "natural" (uncultivated) vegetation, as can be seen in the images above.



The difference between the images illustrates a rebound in biomass, in vegetation coverage, and in the vigor of the plants registered. Grasses and shrubs, more robust and durable than cultivated plants, are now growing in formerly agrarian and livestock grazing ranges.[9] This, the Yale report claims, is most likely an indication of the decrease in the number of livestock and the intensity of farming activity—and thus a decrease in population—that followed "the systematic government-sponsored violence and population displacement committed by Sudanese government and militia forces."[10] What could have otherwise been interpreted as a return to wilderness—as nature repairing itself—is instead interpreted as an effect of the killing and displacement of humans.

NDVI is a product of one of several hyper-spectral sensors that register wavelengths beyond the spectrum perceivable to the human eye. The digitization of this data extends the capacity to monitor patterns of land use transformation as human rights violations across the surface of the earth. Given the properties of an "object"—a house, a vehicle, earthworks, a vegetation type—as visual or thermal information, an algorithm can identify and calculate its density and dispersion in satellite images. But even in this completely algorithmic environment, sequences of photographs are crucial. The "before" image is significant because the baseline is calibrated to it. It is from this "normative" state that the difference—or the Δ (*delta*)—marking the extent of transformation to the "after" image is measured.

In this and similar analytical work, human rights violations are made visible by visualizing and scrutinizing some of the previously invisible domains of the electromagnetic spectrum. The exclusion of people from representation is thus complemented by their gradual exclusion from the increasingly automated process of viewing and also, as we have seen, from the algorithmic process of data interpretation.



Dresden, views of its destruction in 1945 and its reconstruction c. 1982. Source: Max Seydewitz, *Die unbesiegbare Stadt. Zerstörung und Neuaufbau von Dresden* (Leipzig: Brockhaus Verlag, 1982).

At its core, the fantasy of forensics is the reversibility of time. Before and after images can be equally read from right to left or from left to right, like the *Hotel Palenque*, which, in the hands of Robert Smithson, became a "ruin in reverse" going through an endless cycle of simultaneous decay and renovation.[11]

Another project evokes this oscillation even more clearly. The book *Bilddokument Dresden: 1933–1945,* which was published in 1946, attempted to represent the destruction of Dresden in sequences of before and after photographs taken by Kurt Schaarschuch. Schaarschuch photographed the city in 1933 in full splendor. A few weeks after the RAF bombing of the nights of February 13 and 14, 1945, he returned to the same sites, trying to find amongst the burnt rubble of his city the locations of the set of prints he had brought with him.

The caption he added to the last photograph in the book called for reconstruction. And indeed, after the partial reconstruction of some of the buildings, a number of photographers returned to the same sites captured by Schaarschuch, matching their viewfinders to his and creating yet more "afters," which approximated the first "befores" and which were reproduced in new city guides. This perception of the reversal of time is reminiscent of one of the most beautiful paragraphs in the literature of war, the fabulous anti-war utopia in Kurt Vonnegut's *Slaughterhouse-Five* achieved simply by inverting the description of the bombing of Dresden:

> The formation flew backwards over a German city that was in flames. The bombers opened their bomb bay doors, exerted a miraculous magnetism which shrunk the fires, gathered them into cylindrical steel containers, and lifted the containers into the bellies of the planes… When the bombers got back to their base, the steel cylinders were taken from the racks and shipped back to the United States of America, where factories were operating night and day, dismantling the cylinders, separating the dangerous contents into minerals. Touchingly, it was mainly women who did this work. The minerals were then shipped to specialists in remote areas. It was their business to put them into the ground, to hide them cleverly, so they would never hurt anybody ever again.[12]



(Above) Dresden, view of the Frauenkirche before and after its destruction, February 13–14, 1945.
Source: Kurt Schaarschuch, *Bilddokument Dresden: 1933–1945* (Dresden: Stadtmuseum Dresden, 1946).
(Below) Dresden, view of the Frauenkirche immediately after and long after its destruction.
Photos: Kurt Schaarschuch (left), Stefanie Elsel (right), 2013.

1 Mary Warner Marien, *Photography—A Cultural History* (London: Laurence King, 2006), 44–45.

2 Higher-resolution images are available to state agencies, but the regulation limiting the resolution of publicly available images was set so that they would not register the human body. Conversation with Lars Bromley (UN satellite image analyst), January 28, 2013. See also the Land Remote Sensing Policy,1992, available at http://geo.arc.nasa.gov/sge/landsat/15USCch82.html, last accessed December 2013.

3 Andrew Herscher, "Envisioning Exception, Satellite Imagery, Human Rights Advocacy, and Techno-Moral Witnessing," lecture at the Centre for Research Architecture, March 4, 2013. Herscher's lecture has been influential during the editing stage of this piece. It was included in a series of seminars on satellite imagery titled "Sensing Injustice" that Susan Schuppli organized in the context of the Forensic Architecture project. Other contributions to this series have been helpful in shaping this essay, including Lars Bromley's contribution, on November 27, 2012; John Palmesino and Ann-Sofi Rönnskog's, on January 29, 2013; and of course, Laura Kurgan's "Close up at a Distance," April 19, 2013. More information on the series is available at http://www.forensic-architecture.org/seminars/sensing-injustice/.

4 Conversation with Lars Bromley, January 28, 2013.

5 In her book *Close Up at a Distance: Mapping, Technology and Politics* (New York: Zone Books, 2013), Laura Kurgan discusses the ways in which satellite vision technologies have created a radical shift in our ability to use the spatial realm as a political, human rights, and military reference point. The bulk of this essay was written before the publication of this book; we also consulted Kurgan's website, www.l00k.org, which contains much of the information later published in the book. Andrew Herscher, in his lecture "Envisioning Exception," reminded us that the fact that these surveillance technologies are used equally by militaries and human rights organizations is not without its dangers.

6 Robert Wellman Campbell, ed., "Phnom Penh, Cambodia: 1973, 1985," *Earthshots: Satellite Images of Environmental Change*, 8th ed. (Sioux Falls, S.D.: USGS EROS Data Center, 2008), available at http://earthshots.usgs.gov.

7 Kimmo Kiljunen, ed., *Kampuchea: Decade of the Genocide: Report of a Finnish Inquiry Commission* (London: Zed Books, 1984). The Finnish Inquiry Commission estimated that about 600,000 people in a population of over seven million died during phase I, while two million people became refugees. For the second phase they give 75,000 to 150,000 as a "realistic estimate" for outright execution, and the figure of roughly one million dead from killings, hunger, disease, and overwork. For more about the Finnish Commission, see Edward S. Herman and Noam Chomsky, *Manufacturing Consent: The Political Economy of the Mass Media* (London: Vintage Books: 1994), 260.

8 A political debate over the interpretation of these two images emerged between the "anti-imperialists" opposed to the US bombing in Vietnam and Cambodia, who saw it as an extension of US domination—most clearly exemplified by the position of Noam Chomsky—and the "anti-totalitarians," who saw the Khmer Rouge as a totalitarian menace that called for international intervention. In the late 1970s and early 1980s, the exposure of Khmer Rouge's massacres in the name of a rural utopia, their attempt to rearrange the very fundamentals of space, and undo—once and for all—the division between cities and countryside, culminating in the evacuation of Phnom Penh, coincided with the publication of Aleksandr Solzhenitsyn's *The Gulag Archipelago: 1918–1956* (published in three volumes between 1973 and 1976). Each in its own way exposed the horror of totalitarian-state communism and, for many in Europe, delivered it a deadly blow. These developments accelerated the departure of a human-rights movement—anti-utopian and with limited aims—from the ranks of the radical left.

9 See the Yale Genocide Studies Program's GIS & Remote Sensing Project: Darfur, at http://www.yale.edu/gsp/gis-files/darfur/.

10 Ibid.

11 Robert Smithson, *Hotel Palenque*. More information is available at http://www.robertsmithson.com/photoworks/hotel-palenque_300.htm, last accessed December 2013.

12 Kurt Vonnegut, *Slaughterhouse-Five* (New York: Dial Press, 1999), 64.

Mayhem in Mahwah: The Case of the Flash Crash; or, Forensic Re-performance in Deep Time

Gerald Nestler

It must be the case that I have some perception of the movement of each wave on the shore if I am to be able to apperceive that which results from the movements of all the waves put together, namely the mighty roar which we hear by the sea.
— Gottfried Wilhelm Leibniz[1]

Automated Daemons

Shoot first, ask questions later.
— Eric Hunsader[2]



Figs. 1, 2. Stills from CNBS News, May 6, 2010. Images © CNBC.

When financial market prices plummeted and caused havoc on May 6, 2010, stock indices such as the Dow Jones Industrial Average and the Standard & Poor's 500 (S&P500) incurred enormous losses in record time, and even single company stock notations crashed to previously unknown low levels, only to rebound minutes later.[3] To quote but one of the many sources commenting on this global flash of financial pandemia, the event "carries the distinction for the second largest point swing, 1,010-points, and the biggest one-day point decline, of 998.5-points, on an intraday basis in the 114-year history of the Dow Jones Industrial Average."[4]

It was not just traders with open positions who were caught off guard and severely affected. What has become known as the Flash Crash simultaneously sent a shockwave through wider business circles. Live on CNBC, for instance, TV newscast presenters and commentators were discussing the financial backgrounds of the severe protests taking place in Greece as a consequence of the credit crunch and the austerity cuts; but they seemed compelled to shift their attention increasingly to a financial event whose sheer magnitude left them stunned—the immense and unexpected drop in market prices occurring

right before their eyes.[5] Clueless as to what had catalyzed the crash—economic data did not account for a blow of such ferocious violence—they resorted to idiomatic terms such as "capitulation."

Initially, the TV screen showed live footage of the Greek insurgence in Athens meshed with economic data feeds and real-time market prices (a constant presence not only in today's business media) ticking away in a smaller window below. But the live broadcast of protesters pitted against police forces gradually faded, with the discussion shifting in tone and content. Market charts began to fill the screen as the conversation plunged into an emotional debate about what specific contingency might have triggered the downward flood of transactions. The suggested speculative explanations included a "fat finger event" (a typing error), a breakdown of machines (a hardware failure), a software glitch, and rapid selling action due to the European (and especially the Greek) credit crisis. One commentator was heard reiterating recommendations to buy because of the "ridiculously low" levels of some stocks; another proposed "shock and awe" politics in order to get the economy running again. The forceful global deformations introduced by the neoliberal reformulation of self-interested profit maximization became apparent in this instant of simultaneous broadcasting of civil unrest and financial war. The live coverage of the uprising in Greece and the fall in prices, each with its accompanying visual and oral rhetoric, unintentionally evoked the stark contrast between the capitalist regime of financialization,[6] on the one hand, with its debt-induced grip on politics and the economy, and on the other hand, the effects of this regime on the notion of the public good. When the spotlight panned from the destroyed common ground in Greece to the historic instance of an algorithmic crash, market disequilibrium on a gigantic scale obscured a catastrophic failure of an even vaster extent. The Flash Crash eclipsed what has become the symbol of the ruination of the agora of commonality, epitomized by the eruption of popular protest in the site of its ancient origin in Athens.

Below the radar of agencies that were established to monitor market activity, corporate self-interest had created an even deeper level of incorporation: it was programed into the "genetic" code of a new breed of financial agency, the automated daemons of algorithmic trading.[7] Derivatives of mathematical models, algorithms had already revolutionized the logistic infrastructure of exchanges by displacing the trading pit and thus its market makers (the human traders known as "locals") in favor of faster execution rates. Subsequently, these daemonic powers were let loose to directly negotiate with one another on computerized matching machines, exploiting trading opportunities at a speed inaccessible to their human competitors. The foundations for this radical shift were established in the early 1970s. Donald Mackenzie informs us that "financial economics […] did more than analyze markets; it altered them. It was an 'engine' in a sense not intended by [Milton] Friedman: an active force transforming its environment, not a camera passively recording it."[8] Gil Scott-Heron's 1970 "The Revolution Will Not Be Televised" comes to mind, a politically radical poem released at about the same time when the most significant model, the Black-Scholes formula, introduced an algorithm that sparked the first derivative wave of neoliberal market revolutions that today hold sway over the world. But while Mackenzie's account is mainly concerned with "bodies" and their operations, high-frequency trading (HFT)—the generic term for computer-driven algorithmic trading, which takes place in microseconds—has in the meantime abandoned human traders for quant-coded algorithmic market making.

As collateral damage, the epitome of territorialized capitalism, Wall Street, had become a mere symbol. While the crowded trading floor of the New York Stock Exchange (NYSE) is still the undisputed televisual icon of the "market," the media presence obfuscates, more than reveals, what the market has actually become, as a result of what I term the *quantitative turn* in finance. Since 2012 the NYSE and its trading floor have been the property of Intercontinental Exchange, a provider of algorithmic trading platforms operating from Atlanta, Georgia.[9] The new pivotal architectural nodes of what has turned into a deterritorialized, informational capitalism are now the nondescript and nonrepresentative warehouse buildings, filled to the brim with computer servers and fiber optics, in suburban areas such as Mahwah, New Jersey.[10] Although in 2010 this was still future in the making, something unsettling had dawned on acute observers of the epic failure described as the Flash Crash: algorithmic daemonic powers, put in the driver's seat, had slipped away from human control. For the first time, bots had caused mayhem. Not only were automated trading desks affected,[11] but this "revolution" flashed into view as a globally televised event.

Forensics without a Forum

> The past is only the impatience of the future.
> — Elie Ayache[12]

Despite these potential warning signs, however, acute observation was not widespread. A joint commission of two US regulatory bodies, the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), undertook an investigation into the transaction matrix of this singular event:[13] its results were widely criticized as unsatisfying.[14] In a nutshell, the report came to the conclusion that human error reinforced by computer trading procedures triggered the Flash Crash. It blamed a single trader of a mutual fund representing long-term investors for causing the meltdown.

Meanwhile, a less-cited investigation conducted by a small market data feed analyst, Nanex, produced a more convincing result, which challenged the SEC report.[15] Nanex based its research methodology on what could be called a forensic archaeology of historical trading data, and reached a conclusion

that, unlike the official report, was not unwittingly streamlined to a financial elite with major vested interests in HFT.[16] As we will see in more depth below, Nanex proved that algorithmic trade execution triggered the event without human interference. The reason the two reports arrived at such divergent results cannot be attributed to a shortage of material to investigate. Rather, we can ascribe the successful approach to two crucial factors. The first is a quality of depth in investigation, or more technically, the production of quantitative camera-engines with higher resolution on the split-second time scale in which high-frequency trading is carried out. The strata to be investigated had to be discovered and discerned rather than simply considered and surveyed. Thus, algorithmic analytics devices were crucial for unearthing the archaeological evidence.[17] Its material elusiveness—which I will attribute below to a new breed of machines that turn apperception from conscious perception (when mental attention is coupled with previous experiences and conceptions) to technological cognition—hides a thick surface of myriads of data characterized by a propensity towards invisibility and a sort of "counter-perception" that easily escapes cognizability. This fact marks the second crucial aspect of the analysis, the act that made it possible in the first place: the disclosure of proprietary trading data. I will refer below to this ambiguous but essential act as a manifestation of the Janus-face of the expert witness in the field of a forensics of algorithmic and automated trading.

The SEC and CFTC based their official report on the material made available by exchanges and market participants, which showed one-minute trading intervals. This dataset would have been adequate to scrutinize trading activities before the ascent of HFT. But today, to quote the founder of Nanex, Eric Hunsader, "in the blink of an eye, the market moves what used to take humans thirty minutes."[18] With HFT and the Flash Crash—whose naming enunciates a new category of speed—a one-minute resolution view of the material composition conceals more than it reveals. The following account of the Facebook stock market launch (IPO) illustrates the order of magnitude:

ERIC HUNSADER NASDAQ was trying to open the IPO up. By their third attempt, they're telling everybody *Wait, we'll get it at 11:05. No, we'll get it at 11:10, no we'll get it at 11:30.* So it was do or die time. […] Somebody there has the bright idea to just reboot the system. It takes NASDAQ offline a full seventeen seconds. […] When NASDAQ finally did reappear, what happened? The orders that were resting in the book all that time immediately disappeared. Like 60%–70% of all liquidity within 200 milliseconds is gone […].

CHRIS MARTENSON So seventeen seconds of going dark for one of the largest exchanges out there. That must have been several lifetimes for these algorithms.

EH Seventeen million microseconds.

CM Seventeen million microseconds, that's forever.

EH It *is* forever and that's why we see the liquidity and all these books just go—*poof*![19]

For Hunsader, the order of magnitude of microsecond timescales poses a threat to market activity per se. An instantly precipitated lack of liquidity—the disappearance of automated market orders—is the blueprint for market collapse because "algorithms prefer predictability. If something spooks them (e.g., unexpected breaking news; a delay in the market's opening), they simply stop trading. […] With no support and no bids, prices can drop dizzyingly fast. Making matters worse, the 'smarter' algos [financial lingo for algorithms] can recognize a downdraft in process and begin piling back into the market on the short side, exacerbating the price declines."[20]

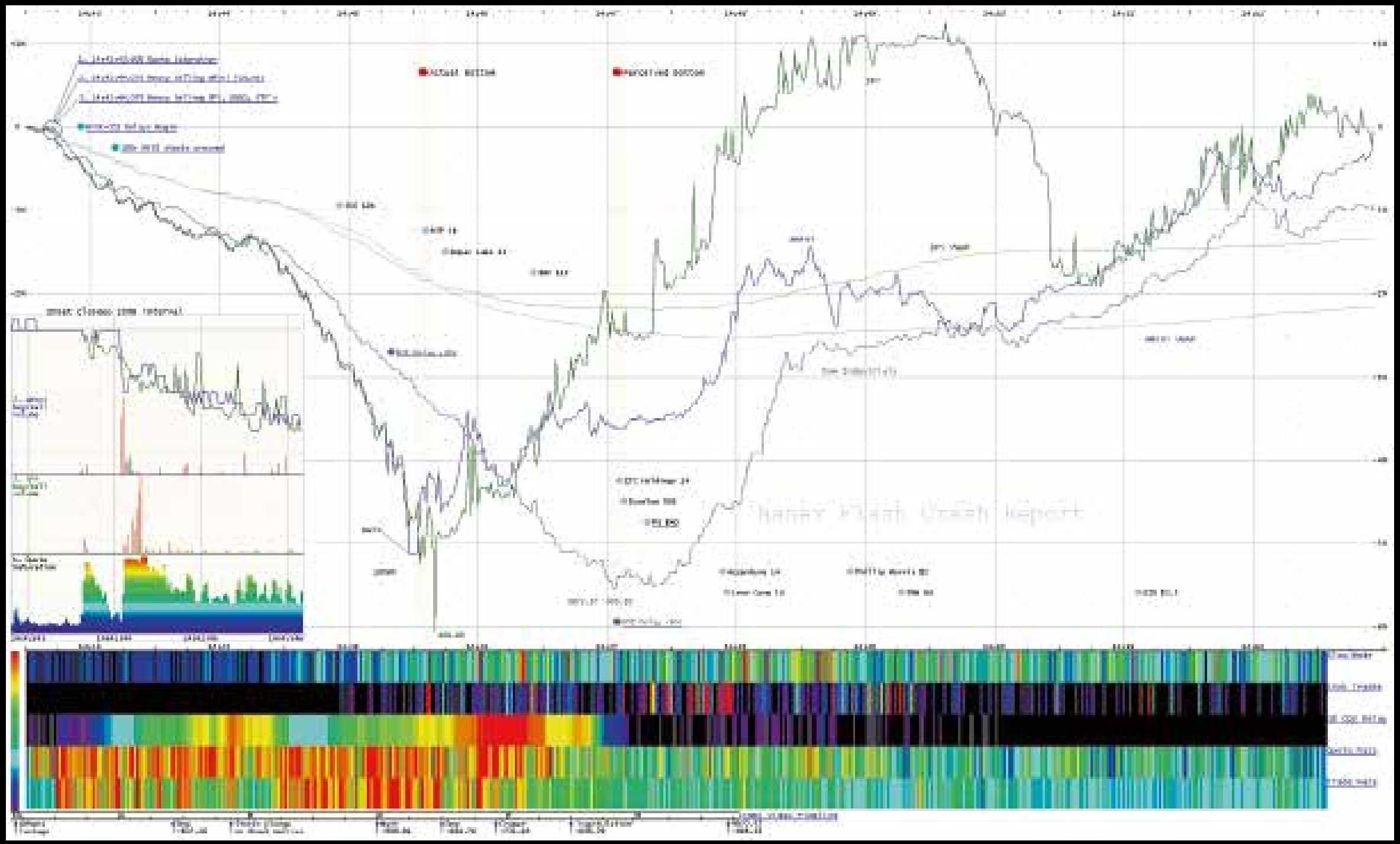
But what this quotation also illustrates is the sheer pointlessness of scrutinizing market activity at one-minute intervals. The officials charged with throwing light on the background of the Flash Crash therefore examined an image that they mistook for razor sharp, unaware that it was blurred and useless. Nanex was able to escape the trap by mistrusting the superficial matrix of one-minute trading accounts. Hunsader subsequently commented that the SEC/CFTC analysts clearly "didn't have the dataset to do it in the first place. One-minute snapshot data, you can't tell what happened inside of that minute," also noting that his own analysts "didn't really see the relationship between the trades and the quote rates until we went under a second."[21]

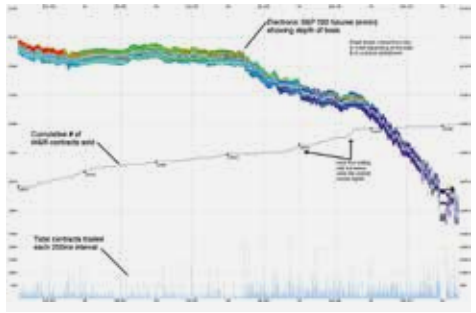
Re-performative Forensics

> In real-world systems, nothing could be less normal than normality.
> — Andrew Haldane and Benjamin Nelson, Bank of England[22]

Nanex is a market research firm that supplies real-time data feeds of trades and quotes for all US stock, option, and futures exchanges. As their website states, "We have archived this data since 2004 and have created and used numerous tools to help us sift through the enormous dataset: approximately 2.5 trillion quotes and trades as of June 2010."[23] Elsewhere they declare that "Nanex's database is now more than 20 times the size of NASA's. That's right—we've got more data on the stocks than we do on space."[24] The capacity to build algorithmic machines that allow the processing of information on such a scale is fundamental to gaining a resolution capable of visualizing—and thus understanding—the trades and quotes that are executed far below the threshold of human sense perception.

Fig. 3. (overleaf) "We present this Flash Crash Summary Report using a time-line graph to distinguish the events that caused the crash from those that were effects of the crash. The main chart covers from 14:42:30 to 14:52:00 in 1 second intervals, and the inset covers from 14:42:43 to 14:42:46 in 25ms intervals." "Nanex Flash Crash Summary Report," Nanex, September 27, 2010. Image © Nanex, LLC.





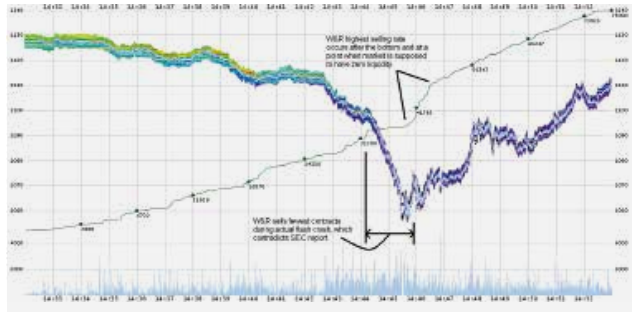


Fig. 4. (left) 250 millisecond interval chart. Both charts show eMini S&P 500 index depth and cumulative Waddell & Reed contracts sold. Images © Nanex, LLC.

Fig. 5. (right) 1 second interval chart.

Nanex's findings contradict the official report with regard to the catalyst of the Flash Crash by showing that the bulk of the mutual fund Waddell & Reed's trades "occurred after the market bottomed and was rocketing higher—a point in time that the SEC report tells us the market was out of liquidity." "May 6'th 2010 Flash Crash Analyses: Continuing Developments: Sell Algo Trades," Nanex, October 8, 2010.

Nevertheless, Nanex did not see this data as sufficient to account for the Flash Crash because they could not match it to its respective sources. As the former HFT trader David Lauer remarked:

> The markets and the interplay in the industry between all theses firms with all these very complicated and complex technology systems and how they interact makes the entire system of exchanges, high-frequency, brokers and the interaction between the technology, it makes it a complex system. […] There is no cause and effect that you can point to. What caused the Flash Crash is a nonsense question. […] And, if you were to replay the same sequence of events, identically, there's no guarantee that it will cause a Flash Crash again. That's the nature of complex systems.[25]

The next step, therefore, was to apply a different strategy, or rather to extend the approach. Discontented with the official report, Nanex resorted to an investigation accomplished not only after the fact but also *after the investigation*: they asked the party blamed (though not identified) in the official report, the mutual fund Waddell & Reed, to grant access to their trading data. In line with the capitalist proprietary regime, it is quite plausible that the fund would have declined this request if it had been made before they were blamed. But by the time the Nanex analysts were conducting their investigation, Waddell & Reed would have had a keen and vested interest in clearing their name, such that they were prepared to disclose their trading data from the time of the Flash Crash. Hence, the incorporation of the "source code" of a proprietary dataset allowed Nanex to classify the data and deliver an account of the actual events that happened in microtime.[26] The analysis relies on an apparatus that pairs the following three different custom-made quantitative frameworks in an effort to deliver a sufficient approximation of trading operations: firstly, Nanex's enormous and ever-extending archive of financial data; secondly, their adaptive quantitative resolution devices, which allow the investigation of these data sets; and finally, the algorithmic trading data of a proprietary participant. This framework allowed them to produce the groundbreaking narrative that subsequently brought to light the cybernetic regime of HFT. Borrowing a linguistic term that is widely used in computing, econometrics, and quantitative finance, we can outline this process as the parsing of the trading performance after the fact (the proprietary dataset provided by Waddell & Reed) by performative cameras that not only analyze but craft a narrative representation (the analysis accomplished by Nanex).

The final representation of the event is composed of an abundance of colorful simulations produced to visualize and flesh out the activities that took place in microseconds. This is a techno-aesthetics that counters the fundamentally iconoclastic situatedness of quantitative informational sign machines which do not communicate with humans. The vision-enhancing sensors that detect the time-blurred traces and help to mark discriminations in a highly complex environment deliver information that has to be "digested" in a separate stage in order to raise it to the surface of visibility and comprehensible representations. Thus, the forensic analysis is neither fully embodied nor defined by the abstract representations of data traffic. Rather, the methodology directing the analysis is situated, i.e., constructed, in between the juncture of performance as the actual presence of an event taking place (exemplified by the occurrence of the Flash Crash) and representation as providing "visual collateral" of a performative re-animation of the original obscured presence after the fact. From this, we can now outline a sharper distinction which will help us to grasp what is at play in the documentation and evaluation apparatus. Artificial sense organs reach into deep time by increasing the resolution bandwidth in order to revisit the otherwise insensible "scene of the crime." The forensic analysis is thus an intricate and extensive cybernetic undertaking characterized by a process of re-mapping, re-modeling, re-visioning, and re-narrating a specific past that happened at near-light speed—a performance *ex post* that *was* the occurrence of a future event. As this approach re-enacts the *performance* of the event, the methodology can be specified as *re-performance*. The technological, calculative aspect of sifting data to come up with evidence—enacting the reperformance—becomes explicit in the sheer enormity of the material Nanex examined:

> May 6th had approximately 7.6 billion […] records. We generated over 4,500 datasets and over 1,200 charts before uncovering what we believe precipitated the swift 600 point drop beginning at 14:42:46 and ending at 14:47:02. In generating these data sets we have also developed several proprietary applications that identify the conditions described in real time or for historical analysis.[27]

While the ground layers of the disaster zone that led to the blaming of the usual culprit—a human agent—showed nothing but detritus, only rigorous research into the deeper, less perceptible strata of microscopic time revealed the actual material matrix. What emerges is an excavation that entails an inversion of the relation between time and space: while the common notion

of archaeology entails entering into concrete and thick space cautiously (as when employing technologies of surveying, probing, and classifying, for instance), in order to extract the material witness of a former era, a forensic archaeology of finance, in contrast, probes into the imperceptible materiality of time to detect patterns and recover artifacts whose existence is derived from financial models and built on technologies of miniaturization, automation, and infrastructure aligned with politics of securing, excluding, and enclosing. The story of the Flash Crash unfolds in the immensely extended realm of trading bandwidth in which what becomes apparent is a techno-political regime of exclusion/inclusion that clearly prioritizes the algorithmic "aesthetic and mode of thought" of a tiny but superior elite of HFT traders, or, more precisely, HFT quants.[28] ("Quant" is financial lingo for the quantitative analysts that develop algorithms.) In attempting to illustrate the complex background of the impact, Nanex resorted to metaphor: "The SEC report uses an analogy of a game of hot-potato. We think it was more like a game of dodge-ball among first-graders, with a few eighth-graders mixed in. When the eighth-graders got the ball, everyone cleared the deck out of panic and fear."[29]

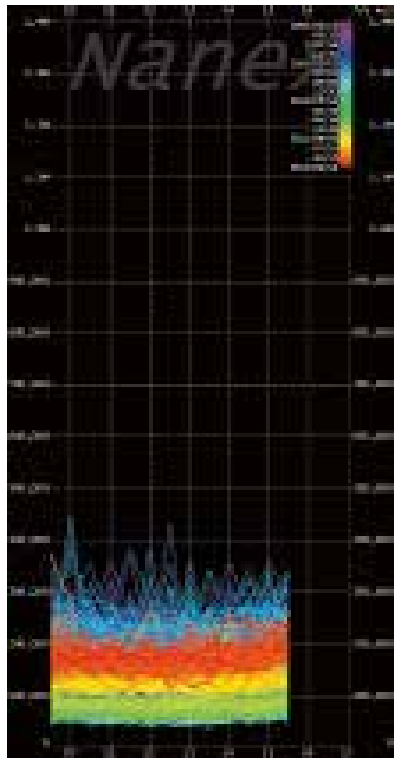
The Liquidation of Liquidity

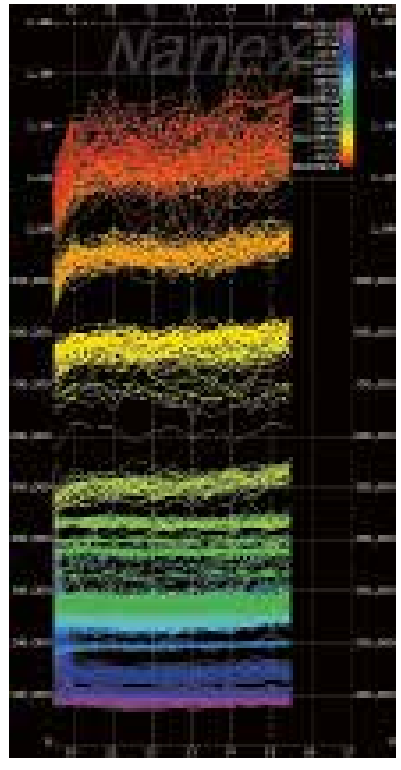
Shit happens, don't judge me.
— Suhail Malik[30]

With this in mind, it is not surprising that sociologists of finance, such as the London School of Economics' Daniel Beunza, speak of the Flash Crash as a watershed event in the history of markets. The official narrative has up to the present day not seen fit to abandon the usual scapegoat of the human actor, presumably due to a reluctance to lay the blame upon technologies and infrastructures that have seen massive investment in recent years, including high-end quantitative engineering, fiber optic networks, and data collocation systems, as well as the security infrastructure (the global real-time network architecture of financial markets).[31] Yet the actual analysis of the Flash Crash produces a picture saturated with a violence whose perpetrators evidentially were neither human agents nor human-robot interactions (as the SEC report concluded) but massive robot-robot interactions materialized in trading quotes. In the era of algorithmic trading, distinguishing between quotes (bids or offers) and actual trades (when a bid and an offer are matched and deliver a price) is crucial because in comparison to quotes only a smaller amount of market action delivers trades. Nanex provides estimates that tell the story in full: more than 70 percent of exchange trades are due to algorithms; but exchange quotes surpass this figure to a degree that lends the term "capitulation" a new meaning—99.9 percent.[32] These figures prove that a bot almost always partners a transaction.

Fig. 6. (left) Chart showing the (lack of) growth of high frequency trading.

Fig. 7. (right) Chart showing the growth of high frequency quoting. Images © Nanex, LLC.





Hence, algorithmic trading adds to market liquidity,[33] as advocates of HFT never get tired of emphasizing.[34] The irony, though, is that they are more than right on this point—in actual fact, algorithmic trading *is* the liquidity of the market. The obvious conclusion is that trading machines have taken over. High-level investment strategies are shifting from human decision making to machine decision making. Wilkins and Dragos argue that "algorithms are no longer tools, but they are active in analysing economic data, translating it into relevant information and producing trading orders."[35] With algorithms calculating probability and deciding on entry and exit strategies as well as execution, an *event* (for instance bad news about the economy or political incidents, etc.) might easily stop their action and massively drain the market of liquidity, as the incident of Facebook's IPO illustrates.[36] Which human market maker on one of the few remaining trading floors would dare to take competitive issue with bots acting in microseconds, knowing that "shit happens"—that bot quotes can disappear in a flash or a bot strategy can trigger a huge amount of actions by other bots that will reinforce the event? As a result of speed, the market forum is deserted in a flash (by human standards) when a Flash Crash (by algorithmic standards) is born.

The evidence procured by Nanex's exacting application of forensic data gathering and analyses, to a degree seldom experienced in the context of financial markets, reveals that trading technologies and procedures today shape markets beyond both the intellectual and political grasp of officially installed regulatory bodies.[37] These facts point to a space of (trans)action which not only surpasses human trading and regulatory surveillance capabilities; the incompetence of governance—technologically as well as intellectually—also has obvious effects on the political leverage of policy makers and, in turn, of constituents. This is exacerbated by the fact that we are dealing with a field in which the eyewitness is invalidated because these processes are beyond the cognitive ability of the human brain.[38] No one is present at the scene, No one observes what is happening. As one commentator put it, quoting the trader and author Sal Arnuk: "It's not just that humans are less and less involved in trading; it's that they can't be involved. 'By the time the ordinary investor sees a quote, it's like looking at a star that burned out 50,000 years ago.'"[39]

From an imaginary perspective of algorithms (or algos), humans live in a backward corner of the galaxy. From a human perspective, algos are out of direct reach and the remote control unit has been lost in the bedlam of deregulation,

political stalemate, and the "irrational exuberance" of economic boom times.[40] These shortcomings are not only detrimental in an economic sense. They stifle the potential for delivering judgment through the processes of political dissent, debate, and control (for recovering remote control, as it were), as they already relegate informed political and legal action to the level of nontransparency with regard to business procedures. The "liquidity" essential for policy making—the availability of all information required for informed decision making—is liquidated as well. The public forum introduced to deliver evidence after the fact has capitulated while forensic analysis capable of establishing collected evidence has seldom been heard.

Algorithmic Apperception

> All consciousness is a matter of threshold.
> — Gilles Deleuze[41]

The distinct narratives that were constructed around the Flash Crash and its investigations illustrate to what extent a forensics of financial markets already encounters difficulties in the phase of collecting evidentiary statements. Obtaining such data from the black boxes of proprietary trading firms is notoriously hard.[42] Moreover, investigations are seldom brought before a legal forum, as they already meet insurmountable obstacles at the level of networked governance. A detailed examination of this case—an endeavor that would go beyond the constraints of this article—would show that this is not simply a technical question but is rooted in the interests of incorporated stakeholders.[43] Adopting the viewpoint of ecological economics, Wilkins and Dragos address this issue the following way:

> At the bottom there are the basal species—slaves, serfs, proletarians, free labor, consumers, account holders, etc. These strata are preyed on by those further up the food chain—pension funds, insurance companies, mutual funds, retail banks; and they in turn feed larger financial institutions, such as hedge funds, brokers, investment banks, propriety trading HFTs, etc. Each financial actor exploits the inefficiencies of the prey species and in the process produces new inefficiencies, further ncreasing the information gradient. Within this complex ecology there is a gradual stabilisation of predator-prey relationships, but unlike an actual ecosystem, the financial system has a much higher rate of change, leading to more abrupt singular events like flash-crashes evolving according to an accelerated rate of punctuated equilibria, with multiple black swans and mass extinctions.[44]

Algorithmic bots quote in microseconds. But a quote is just an offer to buy or sell, not a transaction. On the one hand, as mentioned above, quoting provides liquidity for transactions to happen (there is "always" a quote that matches your order and thus renders a transaction and a price). On the other hand, enormous amounts of quotes flood the matching machines of exchange places. Quotes are often placed without the intention to execute. In such instances, their objective is not to facilitate transaction, i.e., to trade; rather, as hidden searchlights in the "dark time" beyond human perception, they prey, for instance, on inefficiencies in the ways large block orders are executed by institutional investors that are rebalancing their huge portfolios.[45] There is little doubt that such aggressive conduct would be considered a crime if we were to translate it to human behavior. But the latest breed of financial daemons seem to be accorded special allowances in this regard, as Jerry Adler has suggested:

> Many [quotes] were never meant to be executed; they are there to test the market, to confuse or subvert competing algorithms, or to slow trading in a stock by clogging the system—a practice known as quote stuffing. It may even be a different stock, but one whose trades are handled on the same server. On the Internet, this is called a denial-of-service attack, and it's a crime. Among quants, it's considered at most bad manners.[46]

Doyne Farmer, codirector of the program on complexity economics at Oxford's Institute for New Economic Thinking, notes that "under price-time priority auction there is a huge advantage to speed."[47] As perception and decision must also be in touch under microtime conditions, in order to avoid acting purely at random (or rather to implement the random indeterminacy of contingencies), quants have consequently been programming decision making into financial algorithms. Farmer's statement therefore leaves room for an interpretation that points to an incentive to implement hurdles for competitors and other insiders (such as regulators) alike. Keeping them in the dark about algorithmic processes not only results in unfair competitive advantage, but ultimately leads to a technological politics of segregation that amounts to the survival of the fittest quant.[48] Felix Salmon, a financial blogger for Reuters, comments: "Inevitably, at some point in the future, significant losses will end up being borne by investors with no direct connection to the HFT world, which is so complex that its potential systemic repercussions are literally unknowable."[49] It is safe to say, therefore, that such a development extends the predator-prey logic of capitalist market competition to a new order of magnitude, which incidentally makes a mockery of the judiciary.

The crucial question is not that of the (in)equality of investment opportunities—to which the predator-prey metaphor would provide an answer. The more radical effects are "borne" by decision-making processes: we cannot make a decision on something that we do not perceive. Recognition in at least one of its many manifestations—be they visual, textual, technological,

algorithmic, or other—is conditional for apperception and decision making. Michel Serres's concept of the parasite/host seems more apt for delineating the new capitalist hegemony that becomes apparent in the interleaving of the black box of time fractions and the black box of proprietary technology, in which even the ideology of the "free market" is reduced to utter absurdity, with proprietary artificial sensing organs capable of penetrating into the dark kept undisclosed by their owners as if their possession were an inalienable right. Given the sheer influence of capitalist markets on society and the power of decision making exercised by financial over public interests—a situation we have been witnessing over and over again in recent years—this not only applies to those individual investors that bots feed off directly (Salmon's concern) but also to the trillions of people who are "invested" as resources in a parasitic system that is at the same time the host.

A Parasite Host

> This is truly the brave new world we are trying to regulate.
> — CFTC Commissioner Scott O'Malia[50]

The cross-fade on CNBC that slowly followed the turn of attention from the live footage of the Greek insurrection to the uncanny intrusion of increasingly volatile market data is not simply a random coincidence of events or an unfortunate accident. Rather, the Flash Crash constitutes the proof of concept of the power of quantitative decision-making circuits. HFT has not suffered in the aftermath of the collapse. Quite to the contrary, it has gained a competitive advantage over other market participants. Furthermore, it has become evident that it is obscure to those commissioned to regulate these practices. In other words, the regulators are not in a superior position; to the contrary, the decisive superiority of HFT corporations over political supervisory bodies was effectively confirmed by SEC representatives when they conceded that the task of building and installing a data feed from scratch, which would allow them to monitor market activity, proved too complex. Thus the SEC had to resort to subscribing to the homegrown data collection system of an HFT company. "The wide gulf in technical prowess between the regulators and the regulated became painfully clear that year [of the Flash Crash], prompting the SEC to explore hiring an outside firm that could gather up-to-the-minute market feeds from the public exchanges."[51] Although this policy move was welcomed, the deal highlights a paradoxical politics that follows the logic of the lesser evil: the data provider commissioned by the SEC, Tradeworx, is one of the foremost HFT trading firms.[52] Their CEO, Manoj Narang, is one of the industry's most outspoken champions of data-driven decision making.[53]

The game that is visually represented by changing numbers on TV screens all over the world today has in fact become invisible and beyond the knowledge even of insiders, as parasitic circuits use technology to conceal their profit opportunities. As Eric Hunsader remarks, "We allow people with faster connections to place and remove offers or bids faster than the speed of light can deliver that information to the other market participants."[54] Thus such practices derail the backbone of capitalist market logic, the allocation of resources based on supply and demand; in an ironic turn, Adam Smith's "invisible hand" makes new sense. In the aftermath of the technology-based quantitative turn in finance, access to a data-stream service alone is not the solution to reaching and staying on the same level as corporate HFT units. Technological development leaps forward and so does knowledge production. In this field of techno-politics, critics lament, regulators lag far behind even though steps have been taken to come up to par. In 2010, the SEC, which until then had mainly employed lawyers, started to hire more technically oriented staff. But as one newly drafted specialist, economist Rick Bookmaster, concedes in a *Washington Post* article, the stakes are high and the gamble could well be lost due to the disadvantages of competition:

> This job cannot be done by SEC lawyers or career government workers. […] We need to entice market professionals into government service who are on par with those in industry. […] The challenge […] is in recruiting undergraduate computer science wizards who might otherwise […] trade for hedge funds. We have to rely on public spiritedness as opposed to dollars to pull them here.[55]

This attests to the degree of perversity inherent in the financial system. Having first been lured away with big salaries from the less affluent fields of science and production, engineers, mathematicians, and physicists are subsequently subject to attempts to persuade them to help take action against the new hegemony. This reflects the overexposure of markets in society: a more twisted, if not false, version of public spiritedness would be hard to find. Although this boils down to drafting in renegades willing to "sacrifice" for a greater good, financial capitalism per se is not challenged. Such a "greater good" seems a far cry from, for example, the common good that would be effected by dissolving the debt bonds set up by markets and financialization.

Hence, the complex, self-generating, self-replicating, self-referential registers of algorithms are part of a larger medium of information circulation. Geared towards exploiting miniscule inefficiencies (in financial terms, arbitrage), what has been termed an "arms race to zero" (the competitive battle to achieve the technological means of trading at speeds approaching the speed of light) is directed towards deeper levels of exploitation that connect these low latency (i.e., extremely rapid delay processing) machines

to the slower computer networks of the financial infrastructure, and from there to wider social nets. In terms of the logistics inherent in HFT, distribution is paramount. Automation not only produces material items (bids and offers, in our example) but also manipulates the conditions of delivery by distorting the "field homogeneity" of the financial matching network. In other words, equal access to the matching machines of exchange places tends to be squashed where HFT rules. Automated spreading of quotes, for example, is not about benefitting from market liquidity by the generic matching process of supply and demand (bids and offers), which is reflected in prices. Rather, these schemes *make* the address by attracting and decoying technologically less privileged order frames and thus construct prices by distorting supply and demand. As producers of noise (the myriads of quotes that serve as liquidity traps), these parasites are only the first in a line, feeding off a host that is in turn a parasite exploiting arbitrage opportunities, and so on. "In the parasitic chain, the last to come tries to supplant his predecessor."[56]

Battled out between corporate vested interests that can afford the escalating expenses, the transactions delivered by the infrastructure of trading engines create the impression of a virtual if not immaterial battlefield subject to only minor material restraints. Nevertheless, the pivotal factor in leveraging this speed war is geographical location. As mentioned before, the less space between the proprietary trading and the exchange's matching engines, the faster the process and consequently the bigger the competitive advantage for whoever is thus optimizing the logistics of HFT automation.

Speed is of the essence. This is why with HFT the "information gradient" discussed by Wilkins and Dragos above is basically a speed gradient. "A trend that began with pigeons ends with subatomic particles, carrying data that is outdated almost before it arrives at its destination."[57] Even if there is an absolute limit to these developments, a divide has opened up, a gaping but invisible abyss: by exploiting timescales beyond the threshold of perception a new class of enclosures has found the means effectively to hide its machinations from slower competitors and public influence alike. In this field, Gottfried Wilhelm Leibniz's notion of apperception has ceased to be a conception of conscious experience emerging from small, unconscious perceptions. The myriads of mathematically constructed small perceptions (of which these camera-engines are not at all "unconscious") define a virtual field of machine apperception where those who do not command the latest cyborg infrastructure are captured or blocked. The financial-market architecture with its proprietary algorithmic logistics has become a black box not only with regard to the parameters of official inquests, but also in terms of knowability much more generally. Thus, what the black box emits is not information but noise. This *technowledge* (to craft a term for the fusion of technology and knowledge beyond human apperception) exerts influence not only on much of the industry but of necessity cripples the public forum as a whole. We encounter a global system that acts not only in the dark but "in the dark of time."

While the past is a random figure, a deficient but nonetheless highly valued stochastic reservoir of historical data calibrated to model future probabilities, the future has turned into a becoming that eclipses the very notion of the moment. In the horizon of human experience, a violence has taken hold that is unnamable, as the flashes of its *now* have no opening. It only strikes collateral. When *that* instant leaks into a moment (the same moment yet a fraction after the micro-instant) and noise starts inflating into a bubble, the abyss of the market crash opens to a bottomless pit of "capitulation" on all fronts.[58] Suddenly, this helpless idiom expressed on CNBC Live reveals its pathological purport: it manifests an assault on a defenseless public—capitulation is nothing else than the cry for bailout. The parasite takes hostage, blackmailing with debt. Thus, the true derivative—that which is dependent on and at the same time fundamental for risk markets—is not a tradable risk product but the public as last resort. We are the ultimate hedge.

The Future Forum and the Double Figure of the Expert Witness

> Those who exercise power always arrange matters
> so as to give their tyranny the appearance of justice.
> — La Fontaine[59]

If it weren't for the sheer mathematical abstraction, iconoclast "imagery" and legal nondisclosure arrangements that occlude these closed microsecond sessions from almost any investigation,[60] let alone inquest, the violence exerted and the pains suffered would arguably not so easily slip under the cover of the hegemonic ideology of the free market as social institution. In the war over miniscule trajectories of future events (risk potentials) and inadequacies happening in moments that can only be noticed by bots (arbitrage opportunities), all those who are not invested in the latest breed of cyborg engines lack apperception and speech—and thus the means for conscious and experienced perception and expression. Furthermore, as we have learned, microsecond manifestations escape inquest and litigation. One could make the case that a violence that violates below the threshold of political forums (including that of jurisdiction) undermines the economic as well as political frameworks set up to keep regimes of power in check. Bot coding is about a relational apperception constituted in an idiom of risk sensitivity, measure, and production that is not constructed to communicate with humans directly.

The artificial life world of financial automation, unsurprisingly perhaps, is not about freedom and equality. It is about a struggle for competitive advantage, if not monopoly, battled out on a surface on which humans cannot tread. The live audio recording of the Flash Crash from one of the few

remaining trading floors where human traders still serve as market makers delivers striking proof of the intermittent uninhabitability of the trading environment.[61] It also resonates with the Nanex metaphor cited above: "When the eighth-graders got the ball, everyone cleared the deck out of panic and fear." Despite the near elimination of the eyewitness from the scene (who as market maker is an expert witness at the same time), the paradigmatic shift to electronic exchange (in most markets) gives rise to the cognate notion of a subtly different kind of witness, one who would be capable of challenging this calculative rape: the *traitor*, the *informant*, the *renegade* who transgresses the unwritten laws of complicity and secrecy. By providing material from undisclosed or classified sources on a broad range of subjects, this figure of the whistleblower has in recent years turned the principal witness for the public, procuring otherwise unavailable evidence of violence. In the financial context, this particular manifestation of the witness—who does not testify on the basis of real presence—becomes the medium of forensics by a logistics of redirection (e.g., the leaking of confidential material that cannot—must not—speak for itself). This witness is not a plain informant. The financial renegade who presents objects as subjects-of-debate is an expert witness as much as the scientific analyst ally who subsequently (re) constructs the forensic narrative by composing the facts. The story of the Flash Crash offers an example of paradigmatic and at the same time ambiguous significance for the possible production of future forums, depicting in all its complexity the horizon of an exposed and discontinuous self-regulating force against the boundless utopia of a self-regulating market.

This Janus-faced configuration of the doubled expert witness might indeed be a figure that resonates with the complex situations encountered by forensics, in which "only the criminal can solve the crime."[62] The notion of the expert witness as one who was originally involved in the event under investigation seems to highlight the Achilles' heel of the particular mode of calculative oppression that works through HFT as part of the paradigm of the neoliberal market. The intricate problem of the resolution of the Flash Crash demonstrates the ambiguity contained: the participation of an insider or even (alleged) perpetrator is required in order to unearth evidential data that was buried in fractions of a second. This is reflected in the SEC's strategy of employing figures with firsthand experience of and expertise in the activities they want to uncover:

> Michael Fioribello, 38, might know more about derivatives than anyone else at the agency. Before going to the SEC, he worked at AIG for nearly a decade, helping to manage the company's derivatives operation. [… He] has provided colleagues with insights into how financial players structure derivatives to conceal something that could be illegal. […] "There can be bells and whistles done to reduce transparency or otherwise circumvent federal securities laws."[63]

In addition to hiring renegades, a further ambiguous but vital objective is to accelerate technological advancement in order to come up to par with perpetually evolving industry standards.[64] In contrast to espionage or surveillance, exploring and surveying an as-yet-unknown environment bears a similarity to cybernetic *reconnaissance*. The military analogy reveals a problematic approach in the regulatory body's perpetual chase after a glimpse behind an ever-moving frontline, as the aforementioned subscription to the data feed of HFT's leading proponent Tradeworx by the SEC illustrates.

Finally, another ambiguity suggests itself: the *only way out* for policy makers, lawyers, activists, and the public in general—the only route forward to the public forum and away from the dominance of boundless and unregulated (i.e., self-regulating) markets—entails, at least for the time being, actively encouraging and supporting the disclosure of proprietary financial data to the public—a criminal offense, except where the source is the owner. Only *renegade solidarity* aimed against the pathological deformation of cognoscibility in this vital field of contemporary power relations seems capable of delivering the relevant information that is fundamental, to paraphrase the quotation from Leibniz which opened this paper, for apperceiving the "mighty roar" of financial markets. In all its ambiguity, re-performative forensic analysis, performed by the double figure of the cyborg expert witness, is a productive force in facilitating a body of accurate performative translations that incorporate the nucleus of the future forum. Instead of resorting to simple answers (the human factor) it enters directly into complex power relations.

In concert with a specific public (in neoliberal lingo, stakeholders), this insurrection against an increasing hegemony of algorithmic daemon powers may facilitate leverage (as ample proof alone is apparently not sufficient) to resurrect both the legal forum of corporate litigation and the political forum of legislation. Renegade solidarity, however, exceeds the finance-state complex. It invigorates the fundamental principles of democracy by directly addressing the public for the common weal.[65] The future forum becomes apparent in manifestations that counteract the neoliberal zeal to redirect the bottomless volatilities of crises from shareholders to society by absorbing the public into competing stakeholder groups. Thus, the future forum in excess of calculation exceeds demand for justice.[66] It will act to dismantle parasitic proprietary enclosures, foster decision making on and in a resurrected agora of communality, and give voice to those whose inalienable rights are truly exploited.

1 Gottfried Wilhelm Leibniz, correspondence with Arnould, October 9, 1687, in *Philosophical Writings*, trans. M. Morris (London: J.M. Dent & Sons, 1934), 85.

2 Eric Hunsader, "Coexisting without Colocating," *HFT Review* (Hunsader's blog), October 18, 2011, http://www.hftreview.com/pg/blog/erichunsader/read/12033/coexist ing-without-colocating.

3 The *Wall Street Journal* published a more detailed summary one day after the slump on May 7, 2010. See Tom Lauricella and Peter A. McKay, "Dow Takes a Harrowing 1,014.14-Point Trip," *Wall Street Journal*, May 7, 2010.

4 Gary Dorsch, "The Forgotten 'Flash Crash'—One-year later," *Global Money Trends*, May 2, 2011, http://www.sirchartsalot.com/article.php?id=152.

5 See "FLASH CRASH May 6, 2010 CNBC," http://youtu.be/IJae0zwoiyU, last accessed September 2013.

6 Wikipedia summarizes "financialization" succinctly as "a term that describes an economic system or process that attempts to reduce all value that is exchanged (whether tangible, intangible, future or present promises, etc.) either into a financial instrument or a derivative of a financial instrument." http://en.wikipedia.org/wiki/Financialization, last accessed September 2013.

7 The website of the Linux-based operating system Arch has a short and comprehensive definition: "A daemon is a program that runs as a 'background' process (without a terminal or user interface), commonly waiting for events to occur and offering services. A good example is a web server that waits for a request to deliver a page. […] While these are full featured applications, there are daemons whose work is not that visible." Wikipedia, s.v. "financialization," last modified January 3, 2014, https://wiki.archlinux.org/index.php/Daemons, last modified July 2, 2013.

8 Donald Mackenzie, *An Engine, Not a Camera* (Cambridge, MA: MIT Press, 2006), 12.

9 Javier E. David, "ICE to Buy NYSE for $8.2 Billion, Ending Era of Independence," CNBC, December 20, 2012, http://www.cnbc.com/id/100330589.

10 "The data center of NYSE Euronext, the international conglomerate that includes the New York Stock Exchange, is in a building in suburban Mahwah, New Jersey, 27 miles from Wall Street." Jerry Adler, "Raging Bulls: How Wall Street Got Addicted to Light-Speed Trading," *Wired*, August 3, 2012.

11 Coincidentally, Automated Trading Desk LLC pioneered automated HFT in the wake of the 1987 market crash. They state on their webpage: "Welcome to the future of automated trading. […] A world where only those that can move fast enough to predict market shifts are able to compete at the highest level." http://www.atdesk.com, last accessed October 2013.

12 Elie Ayache, *The Blank Swan: The End of Probability* (Chichester: Wiley, 2010), 421.

13 CFTC/SEC, *Findings regarding the market events of May 6, 2010* (September 30, 2010), http://www.sec.gov/news/studies/2010/marketevents-report.pdf.

14 For an example of criticism concerning the report's findings, see Tyler Durden (alias), "SEC Releases Final Flash Crash Report—Waddell And Reed Blamed As Selling Catalyst," *ZeroHedge*, October 1, 2010, http://www.zerohedge.com/article/sec-releases-final-flash-crash-report-waddell-and-reed-blamed-selling-catalyst; and for harsh criticism even before the official presentation of the report, Christopher Steiner, "Searching For Flash Crash Culprit, The SEC Fingers Wrong Man," *Forbes*, September 9, 2010, http://www.forbes.com/sites/christophersteiner/2010/09/09/searching-for-flash-crash-culprit-the-sec-fingers-wrong-man.

15 Nanex's final statement, titled "Flash Crash Mystery Solved," March 26, 2013, can be found with links to its research at http://www.nanex.net/aqck2/4150.html.

16 A statement by Nanex, however, points to a different conclusion: "The email exchange [with one of the co-authors of the official report] was very disturbing because the explanation was basically a new and bizarre definition of liquidity […that] states that if a High Frequency Trader (HFT) aggressively buys contracts by executing against existing orders posted by a seller, then the HFT could be classified as a liquidity provider, and the seller classified as a liquidity taker. […] It is exactly opposite of the industry accepted understanding of liquidity, not to mention, basic common sense. It's like saying *up* is down and *down* is up. It seems they were trying to fit the data to match a foregone conclusion. […] To base any future regulations on either of these papers would be ill-advised and reckless. Someone needs to do some serious house cleaning at the SEC and CFTC." "The SEC Redefines Liquidity (when it's convenient)," Nanex Research, April 12, 2012, http://www.nanex.net/aqck/2977.html.

17 "Analysis of the 'Flash Crash,'" Nanex, June 18, 2010 (since updated), http://www.nanex.net/20100506/FlashCrashAnalysis_Intro.html.

18 Transcript of Adam Taggart, "Eric Hunsader: Investors Need to Realize the Machines Have Taken Over. The Blink of an eye is a lifetime for HFT algos," *Peak Prosperity*, October 6, 2012, http://www.peakprosperity.com/podcast/79804/nanex-investors-realize-machines-taken-over.

19 Ibid.

20 Ibid.

21 "U.S. 'flash crash' report ignores research—Nanex," Sify Finance, October 5, 2010, http://www.sify.com/finance/u-s-flash-crash-report-ignores-research-nanex-news-insur ance-kkfiEjeciij.html.

22 Andrew G. Haldane and Benjamin Nelson, "Tails of the unexpected," paper presented at the conference "The Credit Crisis Five Years On: Unpacking the Crisis," held at the University of Edinburgh Business School, June 8–9, 2012, http://www.bankofengland.co.uk/publications/Documents/speeches/2012/speech582.pdf, at 20.

23 "Analysis of the 'Flash Crash.'"

24 Andy Mills, "Fast Cash Dash Flash Crash Clash: Hear and See Some Super Trading," *Radiolab*, February 6, 2013, http://www.radiolab.org/story/267356-fast-cash-flash-crash-mad-dash-clash/.

25 David Lauer in Marijke Meerman, dir., *The Wall Street Code* (Netherlands, 2013), 50:30, http://youtu.be/kFQJNeQDDHA, at 46:00–46:48.

26 See, for example, "May 6th 2010 Flash Crash Analysis: Continuing Developments Sell Algo Trades," Nanex, October 8, 2010 (since updated), http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_WR_Update.html.

27 See the "About" page on Nanex's website, June 18, 2010, http://www.nanex.net/20100506/FlashCrashAnalysis_About.html.

28 Luciana Parisi, preface to *Contagious Architecture: Computation, Aesthetics, and Space* (Cambridge, MA: MIT Press, 2013), x. Parisi traces the "logic of *computation* and its ingression into culture" (ix) in architectural and interaction design. Although she does not respond directly to finance, her characterization of digital algorithms is also applicable to financial algorithms, insofar as she describes them as "performing entities: actualities that select, evaluate, transform, and produce data" (ix) which "are not simply representations of data, but are occasions of experience insofar as they prehend information in their own way" (xii–xiii).

29 "May 6th 2010 Flash Crash Analysis: Final Conclusion," Nanex, October 14, 2010, http://www.nanex.net/FlashCrashFinal/FlashCrashAnalysis_Theory.html.

30 This quip was intended to illustrate the state of contemporary art. Suhail Malik, lecture given at the California Institute of the Arts (CalArts), April 2, 2013, http://vimeo.com/71058588, at 36:33–36:36. The relationship between contemporary art and finance, and their underlying dependence on indeterminacy rather than uncertainty, are addressed in a forthcoming text by the author.

31 For accounts of the background of the Flash Crash and algorithmic trading respectively, see Marije Meerman, dir., *Money & Speed: Inside the Black Box* (Netherlands, 2013), 49 min., http://youtu.be/H4BzsevJthw; and Meerman, *The Wall Street Code*.

32 "The Rise and Fall of the HFT Machines," Nanex Research, http://www.nanex.net/aqck/2804.HTML, last accessed September 2013.

33 Liquidity is essential for price discovery. It constitutes trading opportunity at an asked price (with minor variance) because of the availability of a buyer or seller respectively. Thus, it implies a constant exchange of information and trades. Loss of liquidity implies unacceptable prices that could ultimately lead to a crash.

34 See, for example, Bryant Urstadt's feature on the quant entrepreneur Manoj Narang, "Trading Shares in Milliseconds," *MIT Technology Review*, December 21, 2009, http://www.technologyreview.com/featuredstory/416805/trading-shares-in-milliseconds.

35 Inigo Wikins and Bogdan Dragos, "Destructive Destruction? An Ecological Study of High Frequency Trading," *Mute*, January 22, 2013, http://www.metamute.org/editorial/articles/destructive-destruction-ecological-study-high-frequency-trading#.

36 Tyler Durden (alias), "Nanex: Investors Need to Realize the Machines have Taken Over," October 6, 2012, *Zero Hedge*, http://www.zerohedge.com/news/2012-10-06/guest-post-nanex-investors-need-realize-machines-have-taken-over.

37 See more in "U.S. 'flash crash' report ignores research."

38 See Parisi, *Contagious Architecture.*

39 Adler, "Raging Bulls."

40 The expression "irrational exuberance" was used by the former Federal Reserve Board Chairman Alan Greenspan to describe the dot-com boom and its possibly detrimental results. "Remarks by Chairman Alan Greenspan," Annual Dinner and Francis Boyer Lecture of the American Enterprise Institute for Public Policy Research, Washington, DC, December 5, 1996, http://www.federalreserve.gov/boarddocs/speeches/1996/19961205.htm.

41 Gilles Deleuze, *The Fold: Leibniz and the Baroque*, trans. Tom Conley (Minneapolis: University of Minnesota Press, 1993), 64.

42 This problem is often the basis of complaints voiced by sociologists of finance like Donald Mackenzie and others. See also note 60.

43 As regards the Flash Crash, Nanex's final statement on the case ends with the following remark: "The HFT lobby will vehemently deny any blame for causing the flash crash and will use a number of straw man arguments, eventually enlisting the SEC final flash crash report which named Waddell & Reed as the cause (W&R). […] This is a very complex subject and lobbyists will use that to bamboozle you." Nanex, "Flash Crash Mystery Solved."

44 Wilkins and Dragos, "Destructive Destruction?"

45 Trading ahead of index fund rebalancing exploits algorithmic program trading by institutional investors who split big orders into smaller trades in order to manage risk. Thus, algo traders parasitically prey upon investors' returns. For detailed descriptions of the diverse strategies used by algo traders, see Scott Pattersen, *Dark Pools* (New York: Crown Business, 2012).

46 Adler, "Raging Bulls."

47 J. Doyne Farmer, "The impact of computer based training on systemic risk," paper presented at the London School of Economics, January 11, 2013, 11, http://www.lse.ac.uk/fmg/events/conferences/Systemic-Risk-Centre/Foresight-Report_110113/Papers-and-slides/Doyne-Farmer.pdf.

48 As mentioned above, financial regulation is to a great extent conducted by the industry itself.

49 See Will Knight, "Watch High-Speed Trading Bots Go Berserk," August 7, 2012, http://www.technologyreview.com/view/428756/watch-high-speed-trading-bots-go-berserk.

50 Scott O'Malia, quoted in Kambiz Foroohar, "Trading Pennies Into $7 Billion Drives High-Frequency's Cowboys," Bloomberg, October 6, 2010, http://www.bloomberg.com/news/2010-10-06/trading-pennies-into-7-billion-profit-drives-high-frequency-s-new-cowboys.html.

51 Dina El Boghdady, "SEC going high-tech with real-time trade data," *Washington Post*, December 24, 2012.

52 See http://www.tradeworx.com/.

53 See Urstadt, "Trading Shares in Milliseconds."

54 Quoted in Laurence Knight, "A dark magic: The rise of the robot traders," BBC News, July 8, 2013, http://www.bbc.co.uk/news/business-23095938.

55 Quoted in Zachary A. Goldfarb, "SEC is hiring more experts to assess complex financial systems," *Washington Post*, June 15, 2010.

56 Michel Serres, *The Parasite* (Minneapolis: University of Minnesota Press, 2007), 4.

57 Adler, "Raging Bulls."

58 Noise—as the opposite of information—was first elucidated as a theory of pricing by Fischer Black in "Noise," paper given at the 44th Annual Meeting of the America Finance Association, New York, December 20–30, 1985, published in *Journal of Finance*, vol. 41, no. 3 (July 1986): 529–43.

59 La Fontaine (1668).

60 Andrew Lo, the director of the Laboratory for Financial Engineering at the MIT Sloan School of Management, addressed this problem at a conference on systemic risk and data issues in 2011, referring to a study he conducted on a "quant meltdown" in 2007: "We felt a bit odd about this because [...] you know for a fact that there are people out there that know what actually happened but they're not talking. So in fact, this entire paper could be science fiction or it could be dead on, we have no idea. To this day we don't know because nobody is talking. They are not allowed to talk because that would disadvantage their shareholders." Video available at http://youtu.be/nuDIoBeNwDo (see 13:20–13:55), last accessed September 2013.

61 In the thick of the hostile moments of the Flash Crash, Ben Lichtenstein, the "voice of the CME S&P futures pit" exclaimed (to take a single example): "This will blow people out in a big way like you won't believe," Traders Audio, "May 6 2010 Stock Market Crash," May 12, 2010, http://youtu.be/1mC4tu1NhUA.

62 This is the subtitle of the chapter on forensic architecture in Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2012).

63 Goldfarb, "SEC is hiring more experts."

64 Ibid.

65 Its precarious and vulnerable state in informational capitalism might to some extent be conditioned by insufficient coalitions against the global investor/shareholder hegemony—a crucial counterbalance in order to curtail power regimes, which, for instance, trade unions exerted in industrial capitalism.

66 In the light of automated algorithmic practices in which the future is exploited by the generation of microsecond arbitrage opportunities, the future forum will be a counter-future forum where agency is recuperated from the capitalist enclosure of a future-at-present—among many other things by making use of (instead of being used by) algorithmic processes.

RUINS



The Architecture of Negation

An interview with Robert Jan van Pelt

EYAL WEIZMAN I would like to begin by asking you how you started your architectural investigations of Auschwitz?

ROBERT JAN VAN PELT I got interested in Auschwitz during my doctoral defense in 1984 when I was defending a dissertation on the Temple of Solomon. I had argued that the Temple of Solomon was the most important building in the history of architecture because of the shadow it cast over world history. One of the examiners asked me if today there was a building that has cast the same shadow, and if so which building I thought it would be. I responded: the crematorium in Auschwitz.

In the years that followed I became interested in what was written about what ultimately ends up being Crematorium II, which was the most important of the five Auschwitz crematoria. I realized that the building had never been analyzed from an architectural point of view. So in 1988—this was four years after my defense—I traveled to Jerusalem, to Yad Vashem, to start an initial investigation into the history of this building. I hoped to find something in the archive and what I found was actually a dossier, a very small dossier of the trial of two of the architects from Auschwitz, Walter Dejaco and Fritz Ertl, who had both been tried in the early 1970s in an Austrian court, in Vienna. Then I traveled to Vienna to research the trial: both architects were acquitted, and in the archive of the courthouse I found a stack of drawings that had been sent to Vienna from Moscow and from Oświęcim in Poland. This is 1988, 1989, just at a time when the situation in Poland was relaxing a little and it became possible there to do research again. So I found myself in Eastern Europe really at the right moment asking the question, the basic question: Do you need a permit to build a gas chamber?

EW Can you tell us how it is that the architectural archive at Auschwitz survived at all? I assumed that the Germans were trying to destroy all evidence when they were retreating in January 1945?

RJVP The survival of the Auschwitz building archive is something of a miracle. In September and October of 1944, construction in the camp effectively came to an end. The Russians were approaching. The German personnel of the architects' offices were now drafted into SS units, into pioneer battalions to do more military stuff in defense of the Reich like blowing up bridges. So during the last few months of 1944 the architecture office

was empty. When in the third week of January the evacuation of the camp began it also involved the destruction of evidence. SS personnel from Berlin came in to destroy the crematorium. Key elements of the gas chambers had already been dismantled and taken away to Mauthausen. At this time there was no one left in Auschwitz who remembered that in the basement of the architecture office there were some seven hundred big files. So while the SS was busy burning all the papers at the Kommandantur—and they did a very thorough job—all those other papers were sitting undisturbed in the basement of the architecture office. On January 27 the Russians arrived, and they found in the basement of the architecture office seven hundred architectural files. Russian, and after them Polish, investigators studied some of the architectural drawings of the crematoria, but for them their primary function was to illustrate the statements made by witnesses.

The designs of the crematoria became for the first time an object of forensic argument and, yes, contention in the 1970s when the French Holocaust denier, Robert Faurisson, arrived in the Auschwitz archive. He was really the first person to forensically inspect the drawings of the crematorium because he was convinced that he could find in those drawings proof that these crematoria were not meant as killing installations.

EW What is Faurisson's background? What interests him and why?

RJVP Faurisson was a lecturer of literature. His political background is not completely clear. He seems to have had Nazi sympathies but they are not that relevant in this context; what is relevant is that he was part of a movement in the analysis of texts that rejected the idea that texts are grounded in the context of their time. He believed that in order to read any text you really do not need to know anything about the context—that you should only focus on the words in front of you.

EW Is this part of the transformations within poststructuralist literary criticism?

RJVP Yes, this was a kind of new school of criticism, part of a debate that was going on in literary circles in the 1960s. The problem of course is that if you want to take a literary text such as a poem you may do that, but as a historian when you start using texts as historical evidence you run into difficulty when you take such an approach. Because historical evidence doesn't work like that. It's not so that there is a single proof for an event, a single perfect proof. Historians work the whole time with stuff that accidentally survived. The debris of a historical event can be a torn piece of newspaper, it can be a bill of a lunch party somewhere, it can be anything. And all of that random stuff can become evidence. And none of it was created to be evidence.

Faurisson got interested in Auschwitz during the 1970s when Auschwitz became a symbol of the Holocaust and took on a mythical aura. He wanted to debunk that myth. Paradoxically, the very fact that so much evidence existed for the operation of Auschwitz as a death camp was attractive to him as he had a lot of raw material to work with. So Faurisson began reading Höss's memoirs, written in 1947, and what did he find? He found contradictions. So he began to analyze these contradictions, or what he considered to be completely impossible physical situations. He postulated that once he had found one contradiction or problem in a text, or in the eyewitness testimony, then the whole testimony was without any value. Of course this is not realistic: an eyewitness testimony will have statements that are more credible and statements that are less credible. Faurisson didn't accept that, so he began applying what he called an "acid test" to the testimony. This may work when you apply it to a poem but it certainly does not work when you apply it to a testimony that was given in less than ideal conditions.

EW So on the one hand he is trying to debunk testimony, but on the other hand he turns to materiality and forces others to shift to materiality.

RJVP The apparent brilliance of Faurisson is that he shifted the focus from eyewitness testimony to material evidence. The reason he did so is because once he began applying the acid test to eyewitness testimony, he came to the conclusion that not a single bit of eyewitness testimony either offered by victims, bystanders, or perpetrators could survive his analysis—not a single bit. All of the eyewitness testimony he looked at collapsed because there was always a contradiction somewhere. A trained historian has no problem with this: it actually is part of his or her job to sort out the contradictions and distill them from it the facts. Faurisson took a different approach. He concluded that all eyewitness testimony was worthless.

EW What are the political implications of this? The Holocaust starts becoming prominent after 1968 and towards the 1970s, when it starts to have an enormous political power in the world. The human rights movement and the new humanitarian movements that emerge in the 1970s are a somewhat late response to Holocaust history. They have to raise the specter of the Holocaust as a part of the antitotalitarian struggle.

RJVP After 1967, the Palestinian issue arose. Palestinian nationalism became visible in the early 1970s with hijackings and so on, and the massacre of Israeli athletes at the Munich Olympic Games was front-page news. For the first time, with the rise of the question "What about the Palestinians?," the issue of the legitimacy of the state of Israel became politically relevant. And of course Cambodia made very clear that while the Holocaust of the Jews might have come to an end in 1945, there was still genocidal potential in the world, and that the label "genocide" had great political

repercussions. For example: Chomsky denied that the Cambodian Genocide was a genocide because the, in my view, undoubtedly genocidal policies of the Khmer Rouge were such a godsend for the US State Department as it showed that the Americans had indeed been justified in propping up the earlier pro-American regime. Thus the concept of "genocide" became in the 1970s a political card …

EW So this is the way Faurisson goes to Auschwitz in 1978. On the one hand there's the act of debunking by the fracturing of narrative; on the other hand there is a certain kind of neo-essentialism and positivism, which is developed in relation to materiality. So the word needs to be debunked as material sensibilities need to be created—what I'm pointing to is the way a certain positivism leads to negation …

RJVP Faurisson makes materiality into the only trump card. He went against the traditional narrative and, I think very cunningly, reset the nature of the discourse. He turned it upside down, rejecting the hegemonic narrative by denying all the eyewitness evidence collected and all the documents in archives. Instead he focused on the debris, and on that alone. Faurisson made thus a very radical but also perverse epistemic shift from various classes of evidence in which eyewitness testimony has a place to considering material evidence only.

Once he had turned to the debris, the question was how to read that material evidence? In his first visit to Auschwitz, he had gone to the ovens in Crematorium I, put his finger in the muffle, stroked over the surface, and noticed that there was no soot. This most primitive form of tests may seem ridiculous to us—after all the soot could have been removed in the thirty years between 1945 and 1975—but for Faurisson it sufficed. Later he became more sophisticated when he arranged for an American engineer and expert of execution in the US prisons, Fred Leuchter, to go to Auschwitz and take samples of the walls of what Faurisson and Leuchter claimed to be the "alleged" gas chambers. The lack of cyanide residue in these samples proved, in their eyes, that no cyanide had ever been in those rooms, and hence that the "alleged" gas chambers were fakes. In other words: Faurisson believed that the forensic methods with which scientists subject smaller pieces involved in a crime to analysis could also be applied to big objects like buildings.

EW Let's turn to the trials and the reasons that trials became the medium of negation. How was evidence presented and history debated within that forum? In the 1990s the negationist argument is moving into architecture. That's part of the reason why you are called into court in the Irving Trial in 2000, because you are an expert in architecture, or, more specifically, in the architecture of Auschwitz.[1] I'd like to walk you through the evidence … What do we see in the ruins of Crematorium II itself?

RJVP Crematorium II was destroyed in stages. First, in late 1944, the gassing technology within the underground gas chamber was dismantled, and then, in early 1945, the remaining shell of the gas chamber and the rest of the building was dynamited. The concrete roof of the gas chamber was supported by a beam running in the center of that space. The beam itself was supported by seven columns. The demolition team drilled holes in the columns and filled those holes with dynamite. When they detonated the dynamite six of the seven columns were destroyed, and the beam and the roof supported by it fell on the floor of the room. However, one of the dynamited columns did not collapse—the last column at the far end of the room. As a result a piece of the roof did not fall down, and it is possible to crawl under that piece of roof, get into the original space of the gas chamber, and take a sample if you want to do that.

EW That is the only place where you can enter the gas chamber?

RJVP Yes, this is the only point where you can enter a space that sits between the original floor and the original ceiling. Everywhere else, you will be able to walk in the void left by the gas chamber, but you will walk on the slab that was the roof. At the last column you enter into the only remnant of the space itself—the space that was crushed at the other places between floor and ceiling. This remnant allowed negationists and their "experts" to enter the gas chamber and take samples.

The roof also acquired another great importance to Faurisson. He developed an argument that it was difficult to establish where the four holes had been located in that roof that had allowed the SS to introduce Zyklon B into the gas chamber below. The roof was severely damaged, and it contained many irregular holes as a result of the explosion. But at a first visual inspection it was not possible to find the regular, purpose-made holes used for the introduction of the Zyklon B. From this Faurisson concluded the holes had never existed, and he coined the slogan: "No holes, no Holocaust."

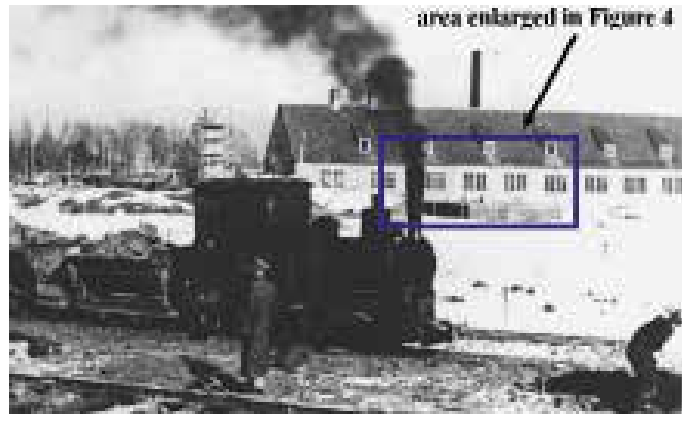


Fig. 1. Photograph by team under SS-Unterscharführer Dietrich Kamann during construction of Crematorium II. Gas chamber visible in front, and three Zyklon "chimneys" can be identified. Hereafter the "train photograph." Auschwitz State Museum, PMO neg. no. 20995/494, Kamann Series. Source: Daniel Keren, Jamie McCarthy, and Harry W. Mazal, "The Ruins of the Gas Chambers: A Forensic Investigation of Crematoriums at Auschwitz I and Auschwitz-Birkenau," *Holocaust and Genocide Studies,* vol. 18, no. 1 (Spring 2004): 68–103.

During the Irving Trial, in which I served as an expert witness, David Irving challenged me to produce in court conclusive evidence of the existence of the holes. If I could do so, he would accept defeat and give up his libel action against Deborah Lipstadt, who had called him a Holocaust denier. I provided

the court with convergent evidence that the holes had existed—eyewitness testimony, a photo taken in 1943 of the back of the crematorium that showed the roof of the gas chamber before it had been covered with soil, and aerial photos taken by US planes in 1944 that showed four black dots on the roof of the gas chamber—and while it satisfied the court (which mattered), it did not satisfy Irving (which did not matter anyway).

The forensic debate on the holes in the London courtroom intrigued the late Harry Mazal. He was a man of many talents. He knew about explosions and their effect. Shortly after I left the witness stand in London Mazal contacted me. He told me that a group of people that included him and that had dedicated themselves to fighting Holocaust denial could help. "We actually have the expertise to find the hole in the ruined slab of the roof," he told me. So he took up Irving on his challenge, and a few months later Mazal and his collaborators went to Auschwitz to find the holes. Because the photo of the back of the crematorium showing the roof of the gas chamber (Fig. 1.) had been so important in my testimony, one of Mazal's collaborators, Danny Keren, decided to reconstruct the position of the camera and, using this, reconstructed with the help of a computer model the exact location of the holes in the plan of the room.



Fig. 2. Zyklon Hole 1, Crematorium II. Tarpaper separating concrete layer below and sand-cement layer above is visible. Source: Daniel Keren et al., "The Ruins of the Gas Chambers: A Forensic Investigation of Crematoriums at Auschwitz I and Auschwitz-Birkenau," *Holocaust and Genocide Studies*, vol. 18, no. 1 (Spring 2004): 68–103.

At this point I need to note that the effort by Mazal, Keren, and others acquired an urgent character. Irving had submitted an appeal against the Auschwitz part of the case, and it was clear that the question of the holes would take center stage. So locating those holes on the basis of an analysis was already a help. The next thing I did was to go to an engineering consulting firm and … I should really draw this, can I draw this; is this a possibility?

EW Yes.

RJVP [drawing] So here we have the gas chamber which is this long rectangular shape. Here we have the seven structural columns that carry the beam that goes down the center. We know from eyewitness testimony and the US air photos that the gas columns attached to the holes were placed in this zig-zag pattern, two left and two right of the beam. Then

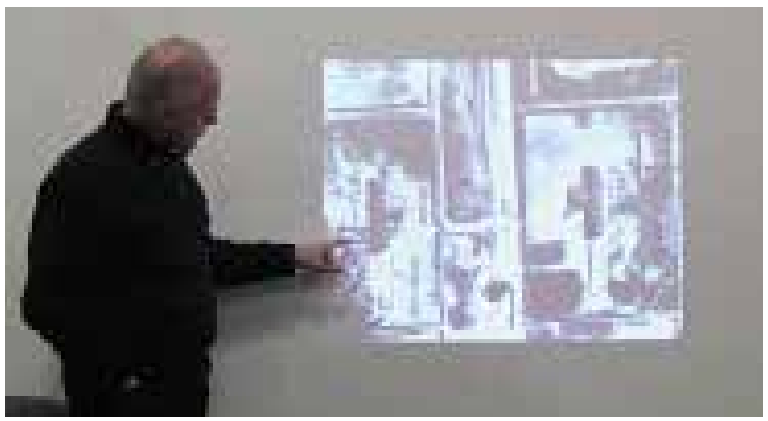


Fig. 3. Robert Jan van Pelt pointing to the roof of the gas chamber in Crematorium I, captured on an aerial photograph shot by an Allied reconnaissance mission on August 25, 1944.

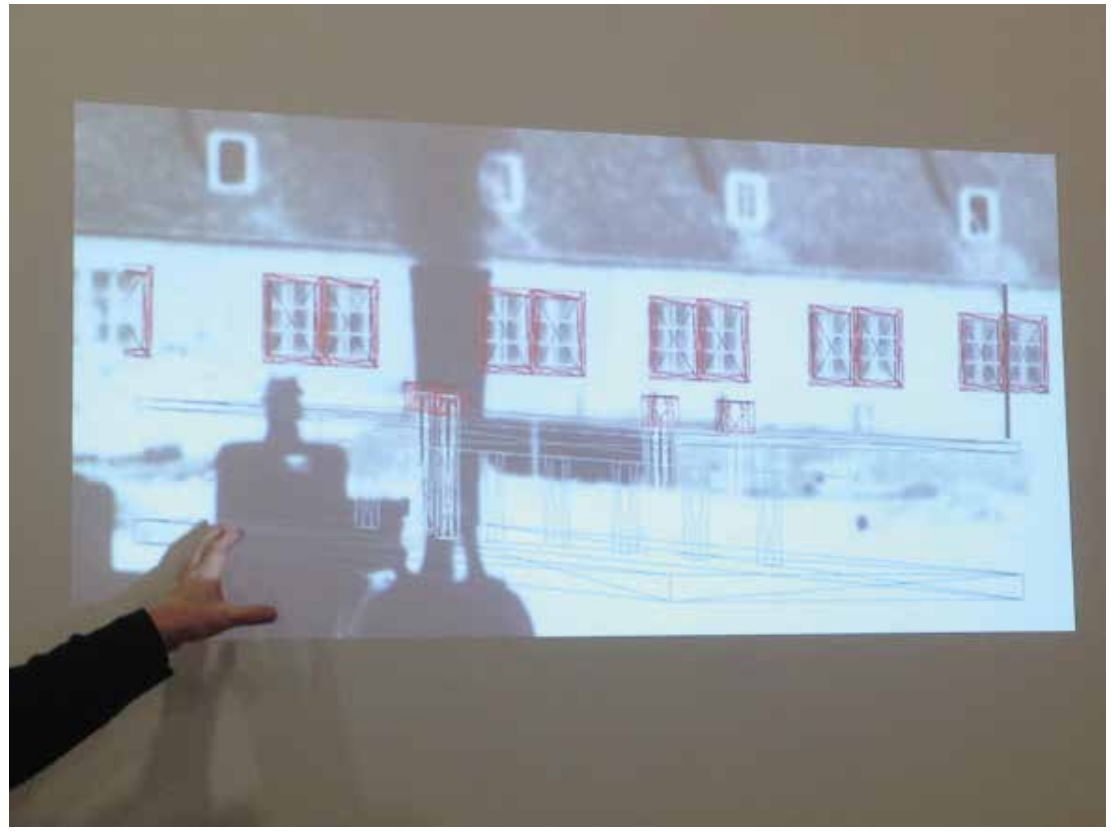


Fig. 4. Robert Jan van Pelt pointing to a superimposition of a wire frame computer model over the "train photograph." The model shows that the protusions on the roof in the photograph align with the known location of the Zyklon introduction chimneys. Keren et al., "The Ruins of the Gas Chambers."

Keren's analysis of the photo of the back of the crematorium (fig. 4) came back, and it showed the same arrangement in the plan, and provided the exact location—so many centimeters left and right from the central beam.

Then I went to a prominent engineering consulting firm and gave them the structural plan of Crematorium II. I asked them: "If there's a beam here and you were to advise me on where to locate holes in this roof, left and right of the beam, where would you locate them?" They then came back with an answer that located those holes exactly at the location suggested by Keren's analysis and the US aerial photo. So I now had an opinion of an engineering firm which was looking at this problem anew, technologically, without any prior knowledge. We already had Keren's analysis of the photo of the back of the crematorium, eyewitness testimony, and the simple zig-zag pattern shown in the aerial photo. So everything was converging. Finally Mazal provided the conclusive proof when he located in the irregular voids left by the explosion the location of the original holes by showing the remnant of the original construction detail that accompanies the creation of a hole in a slab: rebars that were deliberately cut, with the ends turned upwards. The case was settled. We had found the holes.

EW What can you say was the benefit, the service the negationists performed to historical knowledge?

RJVP Certainly in terms of Holocaust historiography I think that they forced us to look at a much larger body of evidence. Without the challenge of the deniers we would know much less about the contingencies in the historical process that ended in the Holocaust. In some way the Holocaust deniers have pointed out inconsistencies and contradictions with that picture. When we look at this historical evidence again we can see that there were contingencies, that this was not a straight historical path. It was a crooked path through which the development occurred, and it allowed us to see that we can in fact explain these seeming inconsistencies and get a much better picture of the way this catastrophe was not a result of one evil man or evil group of men at a particular moment simply saying, "We are going to kill Europe's Jews." This was a complex historical process in which Germans drifted and stumbled into genocidal policies and that actually makes it more frightening because it means these kinds of things can happen without you necessarily setting out to do them. So Holocaust denial has forced us historians to relook at the evidence. And I think that's always good.

London, December 6, 2012. A transcription and video of the full conversation are available at http://www.forensic-architecture.org/audio-video/van-pelt/.

1 For a discussion of the Irving Trial, see "Matter against Memory," part II of Eyal Weizman's introduction to the present volume.

WHAT THE WAR WILL LOOK LIKE
Helene Kazan

This provocative title is taken from a section of a risk assessment report that imagined the possibility of an imminent Israel-Hizbullah war. Written in June 2010, the report forecasts the likelihood of another conflict between Hizbullah and Israel following the previous thirty-four-day war in July 2006 by predicting the "perfect storm" conditions that would bring the current ceasefire to an end. The visual nature of this document, which in itself is populated by an archive of images, maps, and tables, is brought to light by its controversial title, thus further emphasizing the role that images will come to play in developing contemporary notions of risk. While it has become increasingly evident that in order to imagine the future, one needs to generate pictures of what that future might look like, to what extent does the visualization of a risk that comes from an unknown future transform the ways in which life in the present unfolds? How does an imagined threat operate as a form of potential violence that reorganizes not only the potential relations between national bodies but also the everyday spaces of the domestic arena? Can the processes that secure the domestic space against external threat narrate the ways in which we might understand larger political conflicts? If contemporary risk assessment involves a mode of image production that is oriented towards the future, historical images might well provide insight into understanding how the affective register of risk was induced, in part, through the image making itself felt in the present.



D 2055 The new in-door "table shelter announced by the Minister of Home Security in the House today.

In 1940 the UK Minister of Home Security made a public announcement recommending a new indoor "table shelter." Public shelters built specifically to deal with the wartime threat of aerial bombardment had become treacherous due to flooding and the increased risk of disease resulting from the overcrowding of confined, often unhygienic underground spaces. With a shortage of medical supplies and expertise, the UK government adopted a new approach by encouraging civilians to create their own private shelters.

The two images shown here (sourced from the archives of the Imperial War Museum) were included in a press release recommending the use of the indoor table shelter. The first shows a civilian couple, apparently sleeping comfortably under their adapted dining-room table, which has been modified with a thin steel sheet and protective wire mesh. The second presents the table shelter having been subjected to a simulation of possible violence.



D 2058 Indoor Air Raid Shelter. Tests carried out by the Research and Experimental Department. Flat-topped shelter Type T. This shelter was first tested by dropping a heavy block of concrete weighing 350 lbs from a height of 6 ft above the top. The flat top was only dented. The shelter was then subjected to a second test in which a floor weighing 1,800 lbs and pivoted at one side was dropped 6 ft 6 inches and with a swinging action so that it struck one top edge of the shelter as it fell, simulating the manner in which the floor of house usually collapses. The steel angle at the top edge was bent.

These two images form an illustrative dynamic. As "before and after" images, rather than images depicting the event itself, they form a visual relationship which constructs a narrative testifying to the effectiveness of the experiment and its confirmation of the safety that this material apparatus provides. At the same time, this narrative provides vivid impetus for the public imagination regarding the extremity of the violence of a possible attack. The recommendation attempts to validate itself by quantifying and accurately simulating the irruption of violence within the domestic space. Yet through and between the two images which attempt to neutralize this violence, it is as though an imaginary third image were generated—a missing snapshot, as it were, of an experience of the worst.

These images are thus employed in a mode of visual communication that goes beyond stated facts, yet seemingly in two contradictory directions: attempting to calculate and document the potential risks faced by those it advises to shelter in the home, it simultaneously encourages a sense of anticipation of danger, and attempts to imply that it can be effectively managed. Whether the net effect is to enhance fear or to reassure, the projection of an image of (in)security into the public imagination coincides with a particular extension of governance into the materiality of the domestic environment.





The domestic space—the home or the house—is a site of convergence for a complex range of values, expressed through emotional, familial, territorial, financial, national and religious registers, among others. Small-scale actions of preparedness or anticipation put in place to protect this space and its inhabitants against risk tap into this complex set of values, which mediate the effects of risk and its management into a range of affective and experiential registers. A particular relationship between temporality and space is at work here: actions against risk project possible futures and spatialize them in the extension of a present spatial environment. Risk becomes a dark inhabitant of the domestic arena through the shamanistic actions that are undertaken to ward off the gigantic violent forces that threaten destruction. In most cases these interventions cannot expect to fully protect against a direct violent attack, but rather serve as a daily reminder of its sinister potentiality, its constant lying-in-wait.

These two images of actual strikes on a UK home during World War II seem to suggest an explosive force well beyond the levels indicated (both visually and verbally) in the government promotion of the indoor table shelter, raising questions not only about the truth status of the press release, but of its real intended functions.







The use of tape on windows to stop glass shattering, as shown in these three photographs from World War II, is an immediately recognizable small-scale action that is taken within the domestic space in order to defend against the anticipated dangers of both armed conflict and natural disaster. It is a precarious attempt to fortify the home against the attack of an imminent violent force. Although adhesive tape had been invented well before this for the use of sealing ammunition casings, the practice of its use on windows emerged during World War II. It serves as a subtle intervention into the architecture of the domestic space that, by virtue of its function, provides a visual demarcation of the turbulent time and context within which it is situated.



The practice of using tape to stop glass shattering against the violent force of aerial bombing remains common. Here it is seen in a home in Mazraat Yachouh, a small village south of Beirut in Lebanon, west of the Syrian border. This image was taken in 1989 using a Kodak Instamatic camera, following news of a War of Liberation against occupying Syrian forces during the Lebanese Civil War. In the words of the photographer:

> I took the photographs because we were leaving, and thought that we may not be able to come back. The shelling was taking place and it was dangerous, but you wouldn't necessarily lose the whole house, it would be repairable in one way or another; but we thought if the area was overrun, the house would be taken, there would be no way to get it back.

The image was taken not just as a keepsake of the home, but with the aim of providing future proof of territorial right. With no law in place to defend this right, all that was left to preserve and protect was the photograph. However, such photographs were never able to fulfill this hoped-for proprietary role. Instead of testifying to ownership, they bear witness to this moment of insecurity regarding the future. In this way, despite (and perhaps partially because of) its apparent emptiness, the photograph becomes the materialization of an imagined future catastrophe. An exterior, invisible threat permeates the concrete block walls and glass windows of the house, residing there to take occupation of the home.



Twenty-four years later, in April 2013, the same kitchen in Mazraat Yachouh is virtually unchanged, the main distinction being the removal of the taped window. This image is, on the one hand, an index of the right to return accorded to the millions of Lebanese migrants living worldwide as a result of the Civil War; yet in comparison with the earlier image, it evidences the near paradox of an unlived-in empty domestic space, apparently frozen in time. Between them the two photographs create a dynamic relationship between the before and after of an event that didn't occur, but whose potential and effects have been tangible.



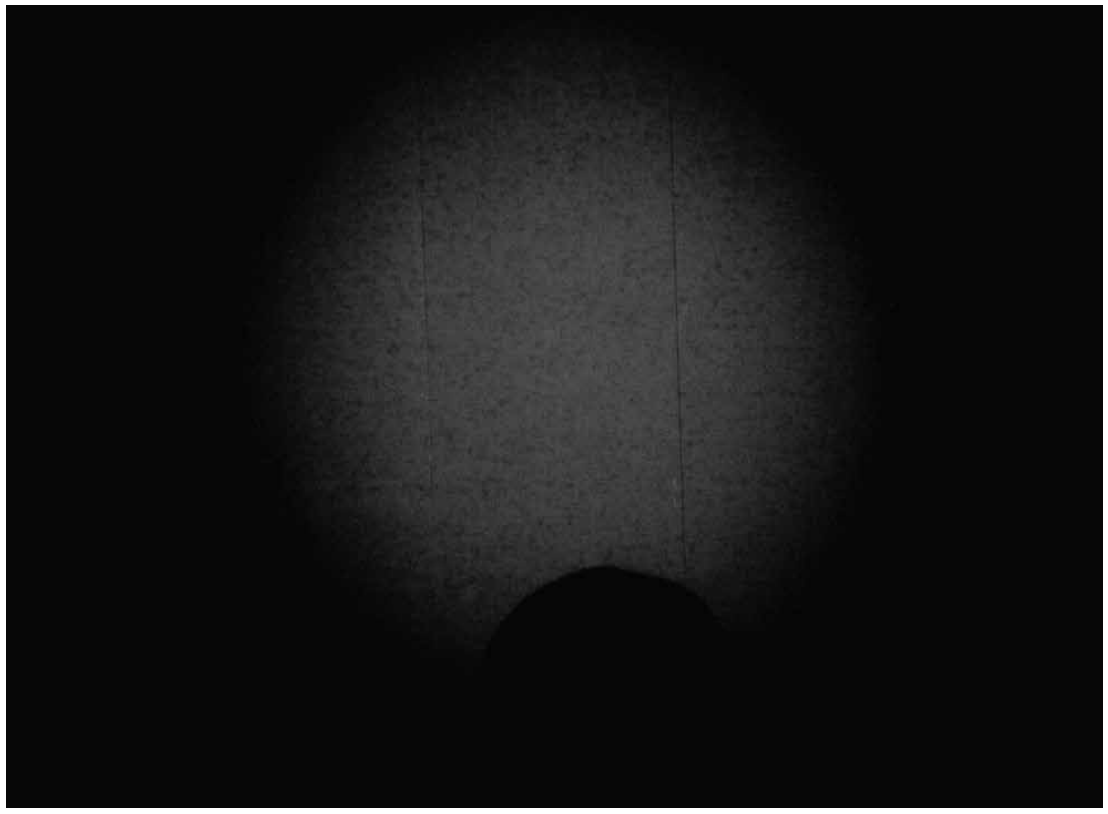
A BBC broadcast covering the escalation of violence in Lebanon in the spring of 1989, represented here by a selection of stills, included an interview with the photographer of the original domestic image overleaf and his family as they alighted the boat from Beirut into the refugee camp in Larnaca, Cyprus. Between the two images, the violent interpenetration of private and public spheres, intensified by the multi-scalar effects of war, comes into view as the snapshot of the interior of the family home is produced for the purposes of legal testimony, while the family absent from the shot becomes the focus of an international news broadcast.

The image opposite depicts a scene from the destruction caused during the war in Lebanon in July 2006. Reproduced on the cover of the risk-assessment report published in 2010, this image is reactivated as a future (or as the future, as the report would have it). Similarly, the written forecast of risk in the report analyzes the previous conflict as a precedent for remapping the past onto future threat. Disseminated as an image of risk across different spheres of influence including insurance, financial services, transportation, industry, governments, NGOs, and the media, the report is advanced as the best possible forecast given the extant information, thus selling a calculable danger to its clientele.

These images portray two strands of risk: one as an abstract probabilistic risk of the future and the other as a tangible, bodily threat. A tension occurs when abstract risk understood as an economic calculus is then recalibrated in the domestic realm. In light of the image of the empty home, we might be prompted to move beyond measuring the threat of war through risk writing to ask what effects this report in itself, and others like it, are already producing. In this photograph, the act of fortifying the windows becomes a subtle sign of future violence, motivated in part by image-narratives produced by the risk-assessment industry.

Forensic Theater: Grupa Spomenik's *Pythagorean Lecture: Mathemes of Re-association*

Shela Sheikh



Grupa Spomenik (Damir Arsenijević, Ana Bezić, Pavle Levi, Jasmina Husanović, Branimir Stojanović, Milica Tomić, with Branislav Jakovljević), *Pythagorean Lecture: Mathemes of Re-association*, forensic performance, 15th PSi conference ("MISPERFORMANCE: Misfiring, Misfitting, Misreading"), Zagreb, Croatia, June 2009. Curated by Branislav Jakovljević. Photo: Vladimir Jerić.

The stage is set, the curtain drawn, apparently in anticipation of the performance's commencement. A spotlight beamed upon the fabric surface seems to invite some subject to step forth from between its folds. But this is no ordinary theater: neither subject nor object enters the stage, and the curtain never rises or parts. In time, a voice begins to emanate from an unlocatable source. Its emotionless tone evokes measure, distance, calculation, administration—an effect which, along with its dis-incorporation, complements the various scientific techniques and items of equipment it begins to sequence:

> Radar / Fluxgate gradiometry / Resistivity measuring equipment / Theodolite / Shovel / Dredger / Brush / Camera / Bags / Labels / Dissecting knives / Personal things.

*

On June 26, 2009, the art and theory collective Grupa Spomenik (Monument Group) performed *Pythagorean Lecture: Mathemes of Re-association* for the first time, at the fifteenth annual Performance Studies International (PSi) conference in Zagreb.[1] The lecture was conceived as a "performance" of the group's newspaper, *Mathemes of Re-association*, itself the product of a series of lectures/workshops/discussions orchestrated by the group since the inception of the ongoing platform (also named "Mathemes of Re-association") in 2008.[2] As with the prior interventions in this series, the lecture took as its primary subject matter the role of forensic science in the process of the re-association of the disarticulated, hence unidentified mortal remains of the victims of the mass killings of Bosnian Muslims (Bosniaks) in Srebrenica (Bosnia and Herzegovina, in Republika Srpska) in 1995. These killings have been defined by the International Criminal Tribunal for the former Yugoslavia (ICTY), established in 1993, as genocide,[3] and are widely considered the worst massacre to have occurred in Europe since World War II.[4]

In what follows, I propose to think this lecture as a "forensic theater,"[5] considering it as the instantiation of a form of *forensis*, in the word's original sense of pertaining to the forum, and as indicating a process that both takes place within and *produces* a forum:[6] in this case, the forum produced, or rather, the process of producing it, constitutes a space of discourse and performance that works to unhinge and complicate common assumptions about the application of contemporary (forensic) science within the realms of humanitarianism and the contemporary politics of memory. Indeed, as we will see, the play between hinging and unhinging, re- and dis-associating, articulating and dis-articulating, is at stake here across a variety of material and conceptual planes.

One of the central questions of both this particular lecture and the wider "Mathemes of Re-association" project is that of "How to think genocide?"—both in the abstract *and* from within the particular historical context to which the work arose as a response.[7] This context must be understood as comprising not only the original acts of killing, but the subsequent and ongoing treatment of the victims both by the perpetrators and in the form of internationally sanctioned, humanitarian responses, and the crucial roles played in these by forensic practices and memorializing rituals. In order to begin to elucidate the complexity of both this forensic theater and the history from which it sprang, I shall begin with a schematic chronicling of three episodes of burial and re-burial (each episode already multiple in itself) that have taken place since the massacre in July 1995: episodes that have, over time, seen enacted the dis- and re-articulation of the victims' bodies and identities in ways that have complex social and political implications. In light of this account, I will attempt to elucidate some of the significance of the scenography and dramaturgy of the forensic theater and its connection with Grupa Spomenik's mobilization and re-inflection of the Lacanian construction of the "matheme."

*

(1) Execution. Burial.
On July 11, 1995, the Bosnian Serb army (the Army of Republika Srpska), under the command of General Ratko Mladić, seized the northeastern Bosnian town of Srebrenica, the enclave of Bosnian Muslim-controlled territory in the eastern part of the country. Since the area had been declared a "safe area" by the United Nations two years earlier, the existing, predominantly Muslim population had grown to forty thousand people, many of whom had sought refuge there after having been "cleansed" from elsewhere in Bosnia (the eastern part of the country was dominated mostly by Bosnian Serbs) when the war broke out in the spring of 1992.[8] As Mladić's troops entered the city, an estimated twenty-five thousand women, children, injured, and elderly residents took shelter in the compound of the Dutch peacekeeping battalion (Dutchbat) stationed at the nearby village of Potočari.[9] Meanwhile, an estimated fifteen thousand Bosniak men and boys, some of them civilians, some soldiers (though many unarmed), fled on foot through the woods of Serb-controlled territory on what survivors refer to as the "Trail of Life and Death," in an attempt to reach Muslim-controlled, free territory—specifically the city of Tuzla, some 50 km away.[10] Over the course of the next three days, of the men and boys from the column, an estimated six thousand were captured and, together with those who had been detained at Potočari, executed by Mladić's army.[11] In total between seven and eight thousand were "slaughtered in carefully orchestrated mass executions" that took place across various sites, beginning on July 13, and buried in mass graves.[12]

(2) Exhumation. Dis-association. Reburial.
Later, during the proceedings of the ICTY, forensic analyses of physical evidence such as soil, shell casings, and wheel tracks were used to document the presence of bodies and vehicles at many of the execution sites. Additionally, satellite images taken before, during, and after the execution period of July 13–17 showed disturbances of the earth that suggested the appearance of mass graves.[13] Such images, at the time classified, were shown to a closed session of the United Nations Security Council that August, providing persuasive evidence of mass executions and contributing to the Clinton administration's decision to commit to the use of force in Bosnia, with NATO bombings beginning on August 30.[14] By November the NATO campaign had succeeded in bringing the Bosnian Serbs to the negotiating table, and the Dayton Peace Agreement, signed on December 14, 1995, officially ended the war.[15]

These satellite images also provided evidence of a singular feature of the Srebrenica genocide: not for the first time in the history of mass crime, but perhaps with the greatest rapidity and to the greatest extent, the perpetrators had subsequently exhumed the mass graves and re-buried the bodies in secondary graves in Bosnian Serb-controlled areas in order to hide their crimes.[16] Furthermore, many of these graves were subsequently robbed yet again, with the victims' remains, by this time already commingled or "disarticulated" beyond identification, re-buried in tertiary graves. As such, in many cases parts of any one body were scattered—dis-associated—across large geographical areas spanning several gravesites.[17]

(3) Exhumation. Re-association. Reburial.
In 1996, the Office of the Prosecutor (OTP) of the ICTY launched its first investigation into mass graves in the former Yugoslavia. In order to level charges of genocide against General Mladić and his civilian superior, Radovan Karadžić, the chief prosecutor, Richard Goldstone, dispatched a forensic team, assembled by Physicians for Human Rights and headed by the forensic anthropologist William Haglund, to begin excavations of four of the suspected mass graves in the hills around Srebrenica. This soon developed into the largest international forensic investigation of war crimes (or indeed, possibly any crime) in history.[18] By the end of 1996, the scientists had exhumed approximately 517 bodies, as well as assorted disarticulated parts, and autopsied them in order to determine the cause and manner of death. However, the bodies remained unidentified. Whilst for the representatives of the ICTY, "the emphasis was on mapping the grave as a crime site and on unearthing the *corpora delecti* as 'articulate witness[es]' to the crimes committed"[19]—with establishing the victims' manner of death being viewed as a sufficient basis for building the case for genocide—the families of the missing demanded individual identification.

Often enraged by the "death attestion" program offered to them by the International Committee of the Red Cross (ICRC)—"paper deaths" which effectively consisted in the subtitution of paper documentation for the absent body of an individual victim—families demanded an identifiable body.[20] For this reason, the International Commission on Missing Persons (ICMP) was established in 1996, and took as its mandate the use of forensic anthropology not in the service of evidentiary and legal demands, but as a tool for the pursuit of humanitarian goals and social and political repair.[21]

Given the difficulty of identifying the disarticulated remains, which had often been violently torn apart and crushed through the Bosnian Serbs' returning to the primary graves with backhoes and heavy machinery (itself a violent innovation in the covering-up of violence),[22] an ambitious program of DNA testing was embarked upon. As Sarah Wagner relates in her study of DNA technology and the search for Srebrenica's missing, the chaos of disassociated and partial skeletons eventually gave rise to "a forensic application of genetic science unique in scale and method that finally offered a means of resolving the missing persons issue by matching blood samples of surviving family members with bone samples from recovered mortal remains."[23] This technique would subsequently be widely used for identifying the victims of other destructive events around the globe, including September 11 and Hurricane Katrina.[24] Through this forensic DNA technology, which allows bodily parts to be pieced or mapped back together

from various gravesites, victims' remains can be returned to family members. Initially, it was decided, based on commonly accepted forensic guidelines and in light of theological advice from members of the Bosnian Islamic Community, that family members should be contacted with news of identification once the skeletal remains of 70 percent of any given individual had been reassociated—though this policy was rescinded in 2004 due to families' demands to receive notification upon the recovery of "even one bone" of their missing relatives.[25] Following identification, the remains are considered buriable (hence mournable), and in the majority of cases find their final resting place in the cemetery of the Srebrenica-Potočari Memorial Center, established in 2003. To date, the ICMP has assisted in accounting for almost 90 percent of those reported missing from the fall of Srebrenica.[26]

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But the success story of the newly developed forensic DNA testing technologies raises—and to an extent masks—a number of crucial social and political questions and problems, above all in relation to the political subjectivity of the individual. Through the various instantiations of the "Mathemes of Re-association" project, Grupa Spomenik has patiently and forcefully unpacked these problems embedded within the processes of identification, demonstrating how, through the conduit of forensic science, they may be seen as contributing to the depoliticization of genocide, and thus setting forth a radically different reading of what would otherwise appear to be a successful technical-scientific-humanitarian endeavour.

This alternative reading has been produced through numerous interventions in a variety of forms, including not only performance, workshops, lectures, and installations, but also publications produced by the collective "Editorial Board of the *Mathemes of Re-association Newspaper*," which were conceived as "distributive" or "take-away" objects, monuments, or artifacts for the public to carry away from exhibition spaces, in a "hand-to-hand" encounter that invited reciprocal engagement and created new spaces of sociality. (As noted above, the group in fact describe the Pythagorean lecture as a "performance" of the publications and the lectures/discussions of which these newspapers are the transcriptions, as such extending the notion of publishing back to its broader sense of "making public," from the Latin *publicare*, and with attendant connotations of "making *a* public.")[27] Such interventions brought forensic archaeologists, anthropologists, and DNA analysts from the ICMP together with activists, philosophers, artists, and theorists of politics, culture, and the management of trauma, thus allowing for collaboration beyond the dominant protocols of international organizations and European cultural policies and, importantly, beyond different disciplinary and geographical communities within the region of the former Yugoslavia.[28] As such, the group has *dislocated* or *ruptured* the boundaries of existing groups, opening up and creating a number of new forums and spaces of sociality

that transcend normative practices, and—vitally, given the subject matter—enabling modes of collective belonging other than ethno-cultural.

Among these interventions, the Pythagorean lecture, in an exemplary instantiation of forensis, encapsulates particularly well how this projective process of forum making is intertwined with a critique of the instrumentalization of forensics. The significance of the piece lies in its fundamental engagement with the very essence of representation, not only in terms of making present and re-presented, but also as an intervention in regimes of visibility and withdrawal from visibility. This opens up an engagement with both the agency of human remains beyond death and (perhaps as) the political subject in postwar society.

*

> Computer screen / Computer / Ventilator / Digital Camera / Plastic box / Blood card / Folder / Centrifuge / Pin / Test-plate / Drying rack / ISO-code / Water system / Thermal cycler (DNA Amplifier) / Silver block / Identification case number[29]

The voice continues its enumeration of objects involved in forensic analysis throughout the performance. Indeed, the list is potentially infinite; in a sense it is still going on. Yet this does not prevent other voices from intervening, from commenting on this endlessness. Folded amidst—not quite against, but almost; and this is the wager—this inventory of impersonal objects, tools of knowledge and calculation (numbers, codes, machines, technologies, and the proper name Srebrenica), an inventory upon which a politics and the mythemes of postwar Yugoslavia have been built, a series of impassioned axioms and questions ventured by unnamed and equally disembodied male and female voices intervene:[30]

> Can we have something that can be shown and used, to witness to the particular politics and to transfer this knowledge, and to transfer the truth of genocide?[31]

Another voice proclaims:

> You can never name all the objects that are involved in the production and management of trauma and affect.[32]

The second (third, fourth, nth) voice, with the connotations of the subjective emanating from its emotional tone, its use of personal pronouns, its seemingly ethical and political concerns, when juxtaposed against (or intervening in) the cold objectivity of the first, may serve to emphasize the traces of subjectivity that are already inexorably interwoven and inscribed within the list of forensic techniques and objects. Alongside and among the theodolite, the dissecting knives, the labels, are "personal things"; the "identification

case number" employed by the ICMP substitutes for and thus alludes to the missing personal identity.[33] In this way, we may be reminded of the way all of these instruments and objects become commingled with traces of the human: something must be put into the DNA amplifier, the blood card, the centrifuge; the plastic boxes do not remain empty. Yet in the process, these traces of the individual, the subject, the missing person, are effectively annulled, flattened out to the same equipmental or instrumental level as every other item in the list, the human remains losing their remaining identity to the very tools and objects intended to identify them.

> Bone models / Bare codes / Metal grid / Shower handle / Plastic bucket / Metal plate / Fist help metal box[34]

At stake here in this forensic theater—as in the practice of forensic science—is the relationship between subject and object. Yet this second order of voices makes its intervention not so much in the name of a human subject, against its objectification by the process of scientific measurement, but of a *political* subject—which ultimately corresponds to the irreducibility of the subject, its inexhaustibility through identification and categorization. The intervention serves to expose the way *both* de-humanizing *and* humanizing gestures, discourses, and endeavours can produce a de-politicizing effect. If, as Thomas Keenan and Eyal Weizman have written, human remains "are the kind of objects from which the trace of the subject cannot be fully removed,"[35] here we see the potential paradoxes and aporias of the forensic gesture in full force. The forensic objects and tools listed by the first voice cannot examine human remains—even with the aim of re-connecting them with a living identity—without first presuming their wholly objectivized status, devoid of any subjective trace. Forensic investigation is supposed to allow bones to speak, to tell their stories; yet here, even in the course of a process which, through forensic DNA analysis, allows them to testify to atrocity, the mortal remains are denied any chance of osteobiography, instead passively accumulating (i.e., being inscribed with) a newly constructed identity which, as we hear in the performance, "radically erases the historical and political event that is the genocide itself."[36]

> And the people who were executed. That is what is not seen in those objects. And it is not enough to say that all those objects are used on recovery of mass graves, or testing, the bone samples taking… . It's not enough because that doesn't fully represent, or it doesn't represent at all, what the ideology behind those objects are! What is new, is the way we talk about it! The new things are the connections that are brought between lost objects, lost people, and lost spaces.[37]

The second register of voices, then, does not intervene in order to restore this lost subjectivity, but rather to draw attention to its erasure through the techno-scientific production and employment of knowledge, in naming, identifying, and, ultimately, instrumentalizing material objects (bones), in combination with cultural and ritualistic techniques of religion and the management of trauma. In doing so, it reveals (produces) the very representation of the Srebrenica genocide as itself an object of contestation. Whilst the efforts and successes of the ICMP and the bodies that have funded and organized the burial and memorial of the thousands of victims are undoubtedly laudable, the performance questions what can also be regarded as the *fabrication* of social repair and the "successful" management of trauma, above all in its treatment of the individual: both the individual victim of the genocide and the individual in contemporary postwar society. Most worryingly perhaps, it points to the possibility that, in the process of "restoring" identity, this humanitarian effort risks extending or perpetuating aspects of the ethnic violence of the genocide itself. For whilst many of the individual victims of the genocide did not identify themselves with Islam prior to the massacre, it was on the basis of their being identified by the perpetrators as part of a collectivity of the ethno-religious group of Bosniaks (Bosnian Muslims) that they were killed. Yet in the course of the humanitarian-forensic response, they are assigned a collective identity once again. In the words of one of the performers:

> Contemporary science and religion holophrase the politics of terror which, in order to carry out the genocide in Srebrenica, first had to construct the object of their collective hallucination, the "Muslim—Islamic fundamentalist," an object nonexistent in pre-genocide society in Bosnia and Herzegovina. This politics of terror, a terror of abstraction over reality, attempted to destroy Yugoslav Muslims completely. In other words, contemporary science, religion and the administration of post-genocide trauma repeat and perpetuate the politics of terror by other means—the very politics which was and is responsible for the victims of the genocide in Srebrenica.[38]

What the group presents us with is a forensic theater which operates by dislodging and dis-articulating the aestheticization and the literal re-presentation (the making present of the absent body) of the practice of forensic science: its rendering of forensic objects in the form of a homogeneous, subject-less list in which no item, including those derived from the human body, is qualitatively differentiated from any other, produces a phonic equivalent of the scenography organizing the rows of identical gravestones at the Potočari-Srebrenica Memorial Center's cemetery, burial site of the majority of Srebrenica's now-identified victims. If theater is a space of fiction, then what the Monument Group's forensic theater presents are the fabrications—the mythemes and political fables—that both uphold and are nourished by claims to truth and scientific objectivity. Or, we might say, what this lecture gives to be thought is a "theater of forensics," with the

of here functioning as a double genitive to indicate both a theater that takes as its object the objectification, institutionalization, and instrumentalization of forensic science, *and* a form of theater functioning as a *forensis*, insofar as it seeks to create a public forum- or platform-to-come (index: the empty stage)—or even, beyond the literal space of the forum, a broader form of reimagined collectivity or *sociality*—"where it would be possible to talk about the wars of the 1990s on the territory of the former Yugoslavia and their consequences."[39]

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In order to better appreciate how this theater of forensics may be understood as engaging in something that goes beyond the sphere of critique—of producing forums as the potential for political subjectivity, rather than merely criticizing existing forums and their attendant discourses, practices, and norms—it may be helpful to highlight how the lecture functions in the context of Grupa Spomenik's broader terminology of "mathemes of re-association."

The group inherits the term "matheme" from Jacques Lacan, who coined it to refer to his use of symbols to stand in for specific concepts/operations in his psychoanalytic praxis. The purpose of the matheme was not to carry out a mathematization of psychoanalysis—as the word might suggest—but rather to formalize certain elements of it in order to avoid their being open to misinterpretation (*méconnaissance*). The aim was, it seems, to replace certain concepts or terms with a fixed symbol so that they could be transmitted in condensed, economical forms, allowing their detail and complexity to be retained without the "noise" that accompanies communication in ordinary language and which invites multiple, if not endless alternative interpretations and (mis)readings. In a corollary that may at first seem paradoxical, however, in its "algebraic" or symbolic capacity, the matheme can also be conceived as standing for any of an infinity of possible contents. This becomes evident when considering specific mathemes, such as the *objet petit a*, the little "a" standing for the (unattainable) object of desire, which could be anything (or any category of thing);[40] or the barred S ($), in which "the slanted bar of noble bastardy" is assigned to "the S of the subject" to indicate "the split (*Spaltung*) the subject undergoes by virtue of being a subject only insofar as he speaks."[41] As Douglas Aoki has articulated, Lacan can be understood as using the matheme to ward off reading, to indicate the very illegibility of subject and object, yet at the same time to make this illegibility itself, in a sense, legible.[42]

These two aspects of the matheme are operative in the Pythagorean lecture's call for "something" that would make it possible to convey, to transfer the knowledge and political truth of (this) genocide, while criticizing the reduction of any given individual to the status of forensic object on the one hand, and its assimilation into a collective identity on the other. The need to reassociate, to "identify" the victims of genocide which gave rise to the ICMP's work is still recognized: yet the effects of the forensic processes by which the ICMP attempted to respond to this need, resulting in the substitution of documentation and identification case numbers for the body of the victim, and the subsumption of their identities into the collective identity "victims of genocide," are resisted. Hence in the group's re-inflection of the term, the idiom matheme comes to stand in for—to supplement or *exceed*—the identification case number assigned to the "missing person" by the ICMP and its forensic divisions, among them the Podrinje Identification Project (PIP). In the words of one of the performers:

> Matheme is not to be confused with the identification case number. It contains the case number, but it is more than the case number itself. Matheme talks about the whole of intersubjective relationships.[43]

As such, the matheme ruptures the chain of equivalences of the process of identification that more often than not culminates in the identification of the individual as a member of the ethnic category "Muslim," "in order to disrupt the holophrasing of science and the politics of terror, and to maintain the openness of the gap, the rupture, that is constitutive of politics proper."[44] To keep open this gap—this space of excess—is, we might venture, to keep open the possibility of a transformation of the stage upon which forensic evidence might appear.

The matheme could be understood to perform a formally equivalent function to the case number in one sense, in that it stands in for the dead where other possible representatives, including the body of the deceased, are absent; but in another sense its function is the opposite of the case number, in that it refuses to reduce any single "missing person" to a homogeneous (multiply identical) or collective identity. Thus the matheme is invoked to represent each and every victim, but retains the uniqueness or specificity of each even in their absence. By comparison, we might consider the way the *objet petit a* can be anything at all—any feature, person, item, idea could be the unreachable "privileged object" of desire from which the subject has constitutively "separated itself off"—yet in every case it is *only* that object which has come to occupy such a position for me that would (though in fact will never) suffice.[45]

Why is the matheme then not to be conceived simply as a replacement for, a non-reductive alternative to, the identification case number, or any other administrative or technical designation? Why must it "contain" and be "more than" the case number? It seems that this is not just a matter of recognizing the necessity of some form of re-presentation—or re-association—to which the case number is a response. Rather, whatever the identity of a given "victim" may now be, it must also be recognized to include the various dis- and re-associating processes it has been subjected to—of which it is (perhaps only now) the subject—including those of forensic analysis and memorial politics. In what may seem a paradox only at first glance, the

uniqueness or singularity of any given identity can only be maintained by a refusal to reduce it to any single body, any particular signification or set of generic identifying categories: such would entail negating the complexity of its constitutive interrelations with multiplicities of other bodies (living and dead, human and nonhuman), including those which are integral to the nature and effects of genocide. Something that would adequately respond to the Pythagorean lecture's call to "transfer the truth of genocide" would thus only be able to do so by communicating all those relations and dimensions which go into each and any putative "identity," and which are always in excess of genocide (contrary to the sublime, all-encompassing horror with which the latter is generally associated in modern humanist discourse), stretching out extensively and intensively before, after, and beyond it. If such a response is impossible, an act that cannot be performed, this impossibility, it seems, can itself be performed.

The lecture, then, draws attention to the fact that the identification case number reduces the uniqueness of the missing identity for which it substitutes into nothing more than a simple fact—effectively transforming uniqueness into equivalence. The fact that its unique referents, its contents, are necessarily unknown begins to transmute into their implicit nonexistence, in the manner of decomposing remains merging with their earthly environment—the very process that forensics, according to one view, is intended to counter. Like the holes in the roofs of the gas chambers at Auschwitz,[46] or the missing persons who were subsequently exhumed and reburied in Srebrenica and elsewhere, it is the absence of an absence that must be recognized, accounted for, and interrogated.

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In light of this, we can perhaps begin to make sense of a "forensic theater" that *shows nothing*, that at least appears to dis-associate itself from visual perception; and which reveals the potential dangers of obscuring or disappearing with the very tools and methods of a forensic anthropology that is premised upon the drive to make present. Both "theater" (from the Greek *theasthai*, "to behold") and forensics are about what is presented *to be seen*. Forensics, or at least "forensic aesthetics," is about the mode of appearance—the dramatization—of things in the forum, as a *mise-en-scène* (literally "placing on stage"), a "staging the truth" or displaying of evidence ("evidence," as Thomas Keenan reminds us, being an *ex-videre*: a bringing [out] into sight),[47] with this rhetorical presentation often holding most public sway when carried out through images. Yet here we seem to have a forensics (in all its polyvalence) determined by a certain form of *absence*, and a certain rejection of or withdrawal from representation, reflecting and challenging a tendency to negate this absence on the part of conventional forensics.

While a plethora of studies have dealt with the paradoxes of forensic analysis in the aftermath of atrocity, Grupa Spomenik's forensic theater offers a unique lens through which to re-view forensics' "matter of fact" as a "matter of concern."[48] The fact that the curtains would not open and that nothing would be offered for visual consumption had in fact been signaled in advance by the *Pythagorean Lecture* of the performance's title. The philosopher Pythagoras is supposed to have lectured from behind a screen in order that his uninitiated students (*akousmatikoi*, "listeners") "[focused] attentively on his words and his words only, without consideration of his appearance, his gestures, his facial expression."[49] In other words, Pythagoras's tool was that of an "acousmatic reduction": a bracketing or suspension of seemingly superfluous details and perceptions, in order that the *akousmatikoi* (translatable as the contemporary postwar audience-interlocutors) might focus exclusively on the sound-in-itself and the knowledge being imparted. As the group states, the Pythagorean lecture is "a specific form of transmission of knowledge" whose dynamics are determined by the physical positioning of the lecturer behind the curtain, with his/her voice serving as "the only accessible source of information and representation."[50]

This act of suspension becomes yet more apparent and pertinent if we follow the trajectory of Pythagoras' acousmatic lesson into the twentieth century, through Pierre Schaeffer's borrowing of the term "acousmatic" from Pythagoras in 1948, eventually arriving at Grupa Spomenik's contemporary use of the acousmatic strategy.[51] Employed within a dramaturgy of absence enacted upon (or against) the stage, the acousmatic form draws our attention to and calls us to reflect upon the complicated and mutually enfolded processes of suspension or bracketing that are implicit within the series of burials and reburials, dis-articulations and re-articulations, disassociations and re-associations with which we began.

Schaeffer, the inventor of what would come to be known as "*musique concrète*" (indicating a music of concrete sounds in the sense both of sounds of the world and sounds as concrete, discrete parcels of material), suggested that we should listen to the "*objet sonore*" (the sonic object) acousmatically, or "blindly," from behind a metaphorical curtain, without regard to the source of the sound, such that attention is directed to the specificity of the sound-in-itself.[52] For Grupa Spomenik, such an "insistent" acousmatic reduction enables a "presence without representation"[53] that makes it possible to respond to "the challenges of the performative setting" and to the why and how of "art after genocide."[54] This acousmatic voice was the only object and medium the group deemed capable of communicating "the axioms of the critique of all ideologies that perpetuate genocide in actuality, without getting entangled in the paradoxes of presentation and representation which are regulated by those who carry out identifications and enumerations of mortal remains."[55]

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As mentioned, what this Pythagorean lecture in which nothing is shown prompts us to consider is the gesture of bracketing or "blinding" that takes place across various registers. While the Bosnian Serb army identified victims not on the basis of their individual identity but rather as members of the

collective category "Bosniak," in the case of the ICMP, the story is the opposite. In the process of collecting bone and DNA samples, unique barcodes (employed as part of the series of identification case numbers that Grupa Spomenik proposes replacing with "mathemes") are assigned to each sample and logged on a database, which becomes "a bureaucracy of postmortem individual identity, not only through genetic profiles but also through compact portraits of the missing and their relatives as donors of blood samples." Whilst this barcode technology allows for the cataloguing of an immense amount of data "in a streamlined manner, protecting against human error as much as possible," this "blinding" procedure, as it is named by the ICMP, carries with it the further advantage of safeguarding the identity of the DNA sample donor, thus removing bias based on ethnic identity.[56] However, the impartiality of this apolitical agenda carried by such a blinding technique and its proclaimed "objectification" and facticity[57] is more often than not lost as soon as the re-associated remains are handed over to families for burial.

In the meetings between the case managers of the Podrinje Identification Project (PIP) and victims' families, the latter are given a choice regarding the burial of their relatives' recovered bodies: they may make their own arrangements, or have the burial take place as part of a collective funeral ceremony at the Srebrenica-Potočari Memorial Center. In transferring the authority over the missing person's identification and the fate of their remains to the families, the intention is that the flow of power that had reduced the victims' remains to nameless bodies be reversed, and that the families "can once again assume their rightful status as the most intimate guardians of the missing persons' remains and individual identity."[58] In the majority of cases, the families choose to hand over the remains to a state-owned service for burial in the annual communal ceremony at Potočari that takes place each July and which is guided by the Bosnian Islamic Community and Muslim burial practices. Whilst the reasons for this are complex, factors include economics (the family would have to bear the cost of a private ceremony) and a desire to "memorialize the tragic event of collective violence as much as individual loss."[59] As such, individual identity is once again bracketed, and the victims of the massacre are retroactively assigned a Muslim identity, endowed with the standardized status of religious martyrs (*šehidi*), even if some—brought up during the communist Yugoslav era—may have considered themselves to be communists and therefore atheists.[60]

This effect is compounded by the spatial organization and design of the cemetery, a homogenizing field of representation in which, as Wagner puts it, "in a conspicuous reversal of the DNA technology's primary thrust throughout the identification procedures, the uniformity and overtly religious design of the *tabut* [coffins] and grave markers reascribe the recovered remains not with individual identity per se but with the very ethno-religious identity that had been the target of the Bosnian Serb's collective violence."[61] As we have seen, the Pythagorean lecture reflects and exposes this very condition by performing the impossibility of a practice of forensic science that is immune to the very logic against which it finds its raison d'etre; and yet, in performing this impossibility, it may be understood as a call for a forum-to-come, one which would be adequate to a non-reductive form of political subjectivity able to testify to "the truth of genocide" without being subsumed within the politics of its memorialization and de-traumatization.

During the performance the group speak of unidentifiable bones that are incapable of reassociation and do not yield to DNA identification. Such bones—as an excessive and stubborn *remainder*—bear the potential to resist identification, quantification, burial, and sacralization.[62] Like the incalculable or more-than-signifying matheme, "this unpleasant, radically inadmissible, material remainder opens up the real space of politics," offers itself as the ground or stage for "a process of subjectification that would not be identity-bound, and that would demand a different sort of memory-politics." Whilst for the Monument Group genocide is fully speakable, albeit when spoken in the language of politics and a critique of ideology, their proposal for a political subjectivization that is tied to both the matheme and the non-identifiable corporeal remainder is not tethered to any name or the program of any predetermined political or social script. Rather, it remains a perpetual performance whose "mandate is to interrupt the 'parallel convergence' of the contemporary constructions of identity and the politics of terror."[63]

I wish to acknowledge James Burton for his conceptual generosity during the final stages of drafting this essay, and particularly for his rigor and clarity on the Lacanian matheme.

The following pages show a selection of images from the various events organized as part of Grupa Spomenik's "Mathemes of Re-association" platform and the group's research visits to the ICMP in Tuzla and Sarajevo, accompanied by statements by the group.

"The 'Mathemes of Re-association' started at the exhibition of the 49th October salon, 'Artist-Citizen—Contextual art practice' (curated by Bojana Pejic), in October 2008, in Belgrade. Grupa Spomenik established the newspaper editorial board 'Mathemes of Re-association' at the exhibition site. We conceived it as a collection of materials related to the production mechanisms of the discursive object 'genocide in Srebrenica,' created through ideological operations and strategic collaboration between contemporary forensic science, the bureaucratisation of the trauma of genocide, and the religious ritual that accompanies the burial of the mortal remains of those executed in the genocide. Within this framework, we started the newspaper's production based on lectures, discussions, and workshops in which the forensic teams of the International Commission on Missing Persons (ICMP) presented their work and the process of re-association of an identity of the person killed in Srebrenica genocide; and on the other side by presenting the contemporary critical theory scene in Bosnia and Herzegovina: writers and cultural theorists who have been testifying to genocide through a critique of the depoliticising mechanisms of the ideology of reconciliation and the administration of the trauma of genocide.

"After the closure of the exhibition, the editorial staff continued their work by inviting philosophers, writers, psychoanalysts, anthropologists, and theoreticians of politics and human rights to answer the question 'How to think genocide?' through their textual contributions. The goal of the work was to introduce, within the cultural, political, and art spaces of Serbia, the phenomenon of genocide as a problem/concept topical to all post-war societies of ex-Yugoslavia. This space had, up until then, been closed for this type of question.

"Two years later, the newspaper/publication *Mathemes of Re-association* was published, presented, and displayed at the exhibition 'Where everything is yet to happen–Exposure' (curated by Antonia Majaca and Ivana Bago) held at the Spaport Biennial, Banja Luka, on October 31, 2010. The newspaper was presented to the audience in Banja Luka by the editor-in-chief, Branimir Stojanovic, in the form of a lecture. The total number of copies of *Mathemes of Re-association* was displayed in the gallery space in the form of a distributive object and immediately thereafter was available to all visitors of the exhibition, which concluded on November 10, 2010. In the meantime (2008–2010), we developed and performed different forms of 'Mathemes of Re-association': a film/lecture called *Towards the Matheme of Genocide* (120 min.), the *Pythagorian Lecture*, and finally the *Matheme* publication."

For further details of the works, see http://grupaspomenik.wordpress.com/mathemes-of-re-assotiation/.

Above (opposite): Sample selection and DNA testing. DNA forensic expert of the ICMP identifying the remains of a victim of the Srebrenica genocide, International Commission on Missing Persons (ICMP) in Sarajevo, Bosnia and Herzegovina, 2008. Photo: Milica Tomić.

Below (opposite): Plastic bag with a selection of the samples undertaken by the forensic expert assigned to the case. International Commission on Missing Persons (ICMP) in Tuzla, Bosnia and Herzegovina, 2008. Photos: Milica Tomić.

"Grupa Spomenik believes that the genocide is fully speakable, but that politics and critique of ideology are the only proper languages in which it can be spoken."







"Podrinje Identification Project," lecture by Dragana Vucetic, Senior Forensic Anthropologist—International Commission on Missing Persons (ICMP) in Tuzla, Bosnia and Herzegovina. Lecture Room No. 2. Editorial Board of the *Mathemes of Re-association Newspaper*. Grupa Spomenik, October, 2008, Belgrade. The image below shows the "Suchey-Brooks Male Age Determination System." Photos: Milica Tomić.





"Drawing on psychoanalysis, philosophy, theory, anthropology, and forensic archaeology, Grupa Spomenik constructs a language in which each participant in a discussion may position her-or himself politically in relation to genocide. Through a series of workshops, lectures, and an editorial board that has developed a newspaper in the exhibition site, Grupa Spomenik critically engages with all ideological mechanisms—local, regional, and international—which both participated in the genocide and have perpetuated it for almost 14 years."



"The Application of Forensic Techniques at Mass Grave Sites in Bosnia and Herzegovina," lecture by Admir Jugo, Forensic Archaeologist/ Anthropologist—International Commission on Missing Persons (ICMP) in Sarajevo, Bosnia and Herzegovina. Lecture Room No. 2. Editorial Board of the *Mathemes of Re-association Newspaper*. Grupa Spomenik, October 2008, Belgrade. Photo: Milica Tomić.



"Identification code explains the relation between specific mortal body remains of an identified person killed in Srebrenica genocide and four different secondary and tertiary mass graves. That means: large number of the killed and short period of execution, quick formation of mass graves, quick burials in mass graves, dislocation of mortal remains to secondary and tertiary mass graves in order to cover up of genocide. 2007." Lecture Room No. 2. Editorial Board of the *Mathemes of Re-association Newspaper*, Grupa Spomenik, October 2008, Belgrade. Photo: Milica Lopičić.

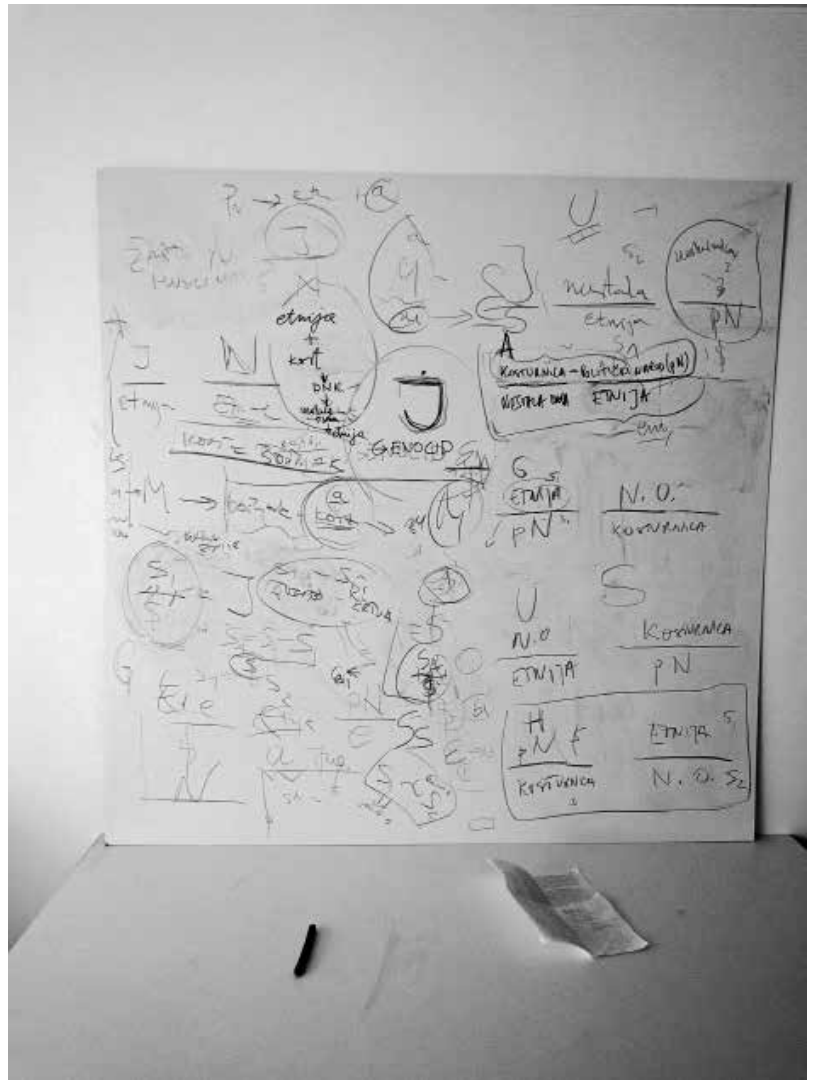
"Amidst resigned and ritualised commemoration of genocide on all levels—local, regional, and European—'Mathemes of Re-association' insists on hope by producing and practicing what is impossible today both in Europe and in capitalist ethno-nationalist states succeeding Yugoslavia: a new politics, with the living and the dead, that is beyond racist mono/multi-cultural demands."



Video stills from Grupa Spomenik (Damir Arsenijević, Branimir Stojanović, Milica Tomić), *Towards the Matheme of Genocide*, March 2009, 120 min.

"Grupa Spomenik intervenes in the established dynamics of administering the genocide: it treats case numbers (assigned to the victims) as mathemes, in order to disrupt the holophrasing of science and the politics of terror, and to maintain the openness of the gap, the rupture, that is constitutive of politics proper."

Production photo from Grupa Spomenik (Damir Arsenijević, Branimir Stojanović, Milica Tomić), *Towards the Matheme of Genocide*, March 2009, 120 min. Photo: Milica Tomić.



"Grupa Spomenik has conceptualised its previous visual art interventions in such a way as to question the exhibiting institutions themselves, by placing in the exhibition site a distributive object—a publication communicating in public space a critique of topical scientific, artistic, administrative, cultural, and religious ideologies, all of which have perpetuated the politics of genocide by other means. In other words, Grupa Spomenik has introduced the topic of genocide into the exhibition space through a discursive critique."

1 The constitution of Grupa Spomenik has varied since its formation in 2002, but comprises members from across the former Yugoslavia and beyond. Members performing in the 2009 performance at the PSi conference #15, titled "Misperformance: Misfiring, Misfitting, Misreading," were Damir Arsenijević, Ana Bezić, Pavle Levi, Branimir Stojanović, Milica Tomić, with guest participant Branislav Jakovljević. The script of the Pythagorean lecture was first published as a dual-language publication, "Matheme" in English and "Matem" in Serbo-Croatian. The English text, together with an introduction by Andrew Herscher entitled "Toward a Political Subjectivization of Memory," was subsequently published in 2011. See Monument Group, "Artist's Intervention: Matheme," *Future Anterior*, vol. 8, no. 2 (Winter 2011): 57–73. The quotation given at the outset is from p. 59.

2 For a full timeline of events within the project, see http://grupaspomenik.wordpress.com/timeline/.

3 See the judgment in the trial of Bosnian Serb general Radislav Krstić: ICTY, Prosecutor v. Radislav Krstić, Case No. IT-98–33-A, Judgement (Apr. 19, 2004); and ICTY Updated Statute (2007), as cited in Sarah E. Wagner, *To Know Where He Lies: DNA Technology and the Search for Srebrenica's Missing* (Berkeley: University of California Press, 2008), 4, 272 n 5.

4 Wagner, *To Know Where He Lies*, 1; and ICTY, "Facts about Srebrenica," http://www.icty.org/x/file/Outreach/view_from_hague/jit_srebrenica_en.pdf, last accessed December 2013.

5 For an earlier account of the notion of the "forensic theater" and the critical dramaturgical role of osteobiography (the reading of the life history of an individual from the evidence preserved in their skeletal remains), see the sound artist Gregory Whitehead's "The Forensic Theatre: Memory Plays for the Post-mortem Condition," *Performing Arts Journal*, vol. 12, nos. 2–3 (1990): 99–109. Whitehead's article is discussed at length by Branislav Jakovljević, a collaborator of Grupa Spomenik, in "On Performance Forensics: The Political Economy of Reenactments," *Art Journal*, vol. 70, no. 3 (Fall 2011): 50–54.

6 See Eyal Weizman's introduction to this volume, "Forensis."

7 Indeed, the problematic question of mass killing as an abstract concept, dissevered from any particular historical-political event, is in effect always already raised in both the event and concept of genocide itself, as the subsumption of each individual death within a singular, collective death operates in the logic leading to both the perpetration of such crimes and the political, ethical, and legal discourses which subsequently name and condemn them.

8 Eric Stover and Rachel Shigekane, "Exhumations of Mass Graves: Balancing Legal and Humanitarian Needs," in *My Neighbor, My Enemy*, eds. Eric Stover and Harvey M. Weinstein (Cambridge: Cambridge University Press, 2004), 85–103, at 90–91; and Wagner, *To Know Where He Lies*, 3, 29, 32.

9 Stover and Shigekane, "Exhumations of Mass Graves," 91; and Wagner, *To Know Where He Lies*, 3. Wagner relates how in March 1994 the Dutchbat relieved the Canadian United Nations Protection Force (UNPROFOR) troops who had been positioned there since April 1993 (31–33).

10 Stover and Shigekane, "Exhumations of Mass Graves," 91; and Wagner, *To Know Where He Lies*, 41. As Wagner relates, approximately 4,500 to 6,000 men survived the 50 km, six-day trek despite coming under intense attack and broke through to free territory. An estimated 2,000 of the 10,000–15,000 men had died during combat with the Bosnian Serb army or when stepping on landmines, and an unknown number had committed suicide in the forest (51). For a detailed account of the events, including the trek, see Wagner's chapter "The Fall of Srebrenica" (21–57); and David Rohde, *Endgame: The Betrayal and Fall of Srebrenica, Europe's Worst Massacre since World War II* (London: Penguin, 1997). See also Eric Stover and Gilles Peress, *The Graves: Srebrenica and Vukovar* (Zurich: Scalo, 1998), 127–32.

11 Stover and Shigekane, "Exhumations of Mass Graves," 91; and Wagner, *To Know Where He Lies*, 48. As Wagner recounts, "according to information collected from surviving family members by the International Commission on Missing Persons, 25 per cent of the total number of Srebrenica missing were detained at Potočari, while the remaining 75 per cent were captured as they tried to escape through the forest" (*To Know Where He Lies*, 279 n 40). See also ICTY, "Facts about Srebrenica," and ICTY, Prosecutor v. Radislav Krstić, Case No. IT-98–33-T, Judgment (Aug. 2, 2001), esp. paras 67 and 84.

12 Prosecutor v. Radislav Krstić, Case No. IT-98–33-T, Judgement (Aug. 2, 2001), paras 67 and 201–253, cited in Wagner, *To Know Where He Lies*, 48, 49. As Wagner notes, since the Krstić case, the Federation Commission for Missing Persons and the ICMP have located and exhumed several mass graves in addition to those detailed in the judgment (279 n 41). According to Stover and Shigekane, many of the bodies of the estimated 2,000 who died in combat or while stepping on landmines were left where they fell, but most were buried in mass graves. Stover and Shigekane, "Exhumations of Mass Graves," 91.

13 Wagner, *To Know Where He Lies*, 51.

14 Although classified, some images were made available to the press. However, some of the images remained shrouded by what Laura Kurgan names "a residue of reticence and secrecy," insofar as one of the administration declined to make public satellite images which were said to include pictures of people crowded into a soccer field. Laura Kurgan, *Close Up at a Distance* (New York: Zone Books, 2013), 21–22. See also 29–30, 117. See also Charles Lane and Thom Sander, "Bosnia: What the CIA Didn't Tell Us," *New York Review of Books*, May 9, 1996, cited in ibid., 117. Perhaps more influential in prompting intervention was the haunting photograph of Ferida Osmanovic, who had hanged herself following her husband's capture, which was published on newspaper front pages around the world soon after the fall of Srebrenica. This photograph of Osmanovic, whose husband was executed by Serb troops, became an icon of the betrayal of Srebrenica. See for instance "A Terrifying Trek for 15,000 Refugees—'Die, Scum, We Are Champs,' Serbs Taunt," *Seattle Times*, July 14, 1995; and Lorna Martin, "Srebrenica 10 years after: Truth behind the picture that shocked the world," *Guardian*, April 17, 2005. With thanks to Thomas Keenan for pointing me to this.

15 Wagner, *To Know Where He Lies*, 55. The Agreement formally divided the Republic of Bosnia and Herzegovina into two entities: the Federation of Bosnia and Herzegovina, and the Republika Srpska.

16 As Godofredo Pereira recounts in his essay in this volume, "Geoforensics: Underground Violence in the Atacama Desert," a similar practice was undertaken by the Pinochet regime in the 1970s in order to hide from the public and the media evidence of the killings carried out in the course of the "Caravan of Death." In that case however, the executions and exhumations were separated by years rather than months.

17 The forensic archaeologist and anthropologist Admir Jugo categorized these during one of the discussions organized by Grupa Spomenik as "primary mass graves," "robbed primary mass graves," "secondary mass graves," "robbed secondary mass graves," and "tertiary mass graves." Admir Jugo, Forensic Archaeologist/Anthropologist—ICMP (BiH), "The Application of Forensic Techniques at the Mass Graves in Bosnia and Herzegovina," lecture/workshop/discussion, Editorial Board of the *Mathemes of Re-association Newspaper*, October 4, 2008, House of Legacy, Belgrade.

18 Stover and Shigenake, "Exhumations of Mass Graves," 89, 91; Stover and Peress, *The Graves*, 92–93.

19 Thomas Lacquer, "The Dead Body and Human Rights," in *The Body*, eds. Sean T. Sweeny and Ian Hodder (Cambridge: Cambridge University Press, 2002), 77; and Victor Buchli and Gavin Lucas, "Bodies of Evidence," in *Archaeologies of the Contemporary Past*, eds. Victor Buchli and Gavin Lucas (London: Routledge, 2001); cited in Wagner, *To Know Where He Lies*, 95.

20 See Stover and Peress, *The Graves*, 195–96. As Wagner notes, the ICRC issued such documents for some of Srebrenica's missing about whom they had gained information from the Bosnian Serb authorities. "The initiative was aimed at facilitating families' access to social welfare, but it also allowed the organization to remove individuals' names from the overall list of missing." Wagner, *To Know Where He Lies*, 91.

21 Regarding the tension between the two roles of forensic anthropology and the exhumation of Mass Graves, see Stover and Shigenake, "Exhumations of Mass Graves." See also Adam Rosenblatt's discussion of the human rights of the dead in "International Forensic Investigations and the Human Rights of the Dead," *Human Rights Quarterly*, vol. 32, no. 4 (November 2010): 921–50.

22 Wagner, *To Know Where He Lies*, 84.

23 Ibid., 86.

24 Ibid., 257–61.

25 Ibid., 179–82. Whilst the formal figure remains 70 percent, in some cases remains are given an individual burial when a far lower percentage is re-associated. However, this leaves open the possibility of further remains of the same individual being found, and thus of the possible need for yet another exhumation and reburial. Moreover, burying partial remains runs the risk of impeding the identification of any additional remains found afterwards.

26 An article posted by the ICMP in 2012 gives the following statistics: "ICMP estimates that between 8,000 and 8,100 individuals went missing from the 1995 fall of Srebrenica. In an effort to DNA identify these victims, ICMP has collected blood samples from 22,160 family members of 7,773 reported victims and compared them with DNA profiles from post mortem samples excavated from mass graves. Of the 7,040 unique profiles extracted from bone samples, 6,838 persons have now been DNA identified by ICMP." ICMP, "Over 7,000 Srebrenica Victims Have Now Been Recovered," July 11, 2012, http://www.ic-mp.org/press-releases/over-7000-srebrenica-victims-recovered/. In 2013, on the eighteenth anniversary of the genocide, a further 409 newly identified remains were buried. "Bosnians rebury Srebrenica genocide victims," Al Jazeera, July 11, 2013, http://www.aljazeera.com/news/europe/2013/07/201371164624198570.html.

27 Whilst the texts produced by the group were never officially published—in the sense of being commercially distributed and entering into publishing or archival networks and databases—they were "published" in the sense outlined above, entering circulation as distributive or take-away objects. As with the group's conception of the "matheme" vis-à-vis the management of the bodies of "missing persons," as we are coming to, such publications resist and escape the fixing of the barcode and identification number; or, in this case, ISBN.

28 The group stresses the importance of *dislocating* the scientific and theoretical community from Bosnia and Herzegovina into Serbia, where putting discussions of Srebrenica on the public table to this day remains problematic.

29 Grupa Spomenik, "Artist's Intervention: Matheme," 59.

30 Regarding the identification of the voices, whilst the participants (or "actors") in the performance were named, in the publication of the script individual identification was rescinded: "After performing the script in the form of the Pythagorean lecture, which contained the names of the people who lent their voices to transfer the axioms about the object 'genocide in Srebrenica,' it was decided to depersonalise the script by removing any trace of the source of the sound and the authorship of the axiom." Grupa Spomenik, "Afterword to *Matheme*" (Tuzla/Llubljana/Rijeka/Beigrad/Palo Alto, 2010), 25 (unpublished).

31 Grupa Spomenik, "Artist's Intervention: Matheme," 59.

32 Ibid., 64.

33 In the words of Grupa Spomenik, "by reassociating the corporeal remains of those who have been executed, [contemporary science] posits case numbers, which administer the following nexuses: place-identity; bone-identity; DNA-identity; skeletal quantification-identity; individual identity-identified missing person." Grupa Spomenik, introduction to *Mathemes of Re-association Newspaper*, unpublished. And as forensic archaeologist Admir Jugo explained during one of the Editorial Board of the *Mathemes of Re-association Newspaper forums*, "a 'case' is not a whole body. A 'case' is defined as any human remains or forensic evidence assigned a court number. […] Usually, the case number is given in the form of the grave code and the case number and designator." Jugo, "The Application of Forensic Techniques."

34 Monument Group, "Artist's Intervention: Matheme," 64.

35 Thomas Keenan and Eyal Weizman, *Mengele's Skull: The Advent of a Forensic Aesthetics* (Berlin: Sternberg Press, 2012), 13.

36 Monument Group, "Artist's Intervention: Matheme," 64.
37 Ibid., 65.
38 Ibid., 64.
39 Milica Tomić, response during Dragana Vućetić, Forensic Anthropologist—ICMP (BiH), Podrinje Identification Project, lecture/workshop/discussion, Editorial Board of the *Mathemes of Re-association Newspaper*, October 3, 2008, House of Legacy, Belgrade.
40 Like most Lacanian concepts/terms, the *objet petit a*, which as his translator Alan Sheridan notes, Lacan wishes to "remain untranslated, thus acquiring, as it were, the status of an algebraic sign," evolves—and resists lending itself to a singular definition or interpretation—over the course of his Seminar in the late 1950s and 1960s. Jacques Lacan, *The Seminar of Jacques Lacan, Book XI: The Four Fundamental Concepts of Psychoanalysis*, ed. Jacques-Alain Miller, trans. Alan Sheridan (New York: W. W. Norton and Company, 1981), 282; see also 83, 103–4, 263–76.
41 Jacques Lacan, *Écrits*, trans. Bruce Fink with Héloïse Fink and Russell Grigg (New York: W. W. Norton and Company), 530; see also 654–59. In these and other ways, for instance in its ambition to "put in a proper light the effects and affects of intersubjectivity and transference, in order to render psychoanalysis (or part of it) transmissible without reference to a last name," the matheme can thus be seen as concerning the "missing person" from the outset. Alexandre Leupin, "Introduction. Voids and Knots in Knowledge and Truth," in *Lacan and the Human Sciences*, ed. Alexandre Leupin (Lincoln: University of Nebraska Press, 1991), 1–23, at 3.
42 Douglas Sadao Aoki, "Letters from Lacan," *Paragraph*, vol. 29, no. 3 (November 2006): 1–20.
43 Monument Group, "Artist's Intervention: Matheme," 59.
44 Grupa Spomenik, "Towards the Matheme of Genocide," October 2009, http://grupaspomenik.wordpress.com/mathemes-of-re-assotiation/towards-the-matheme-of-genocide/.
45 Lacan, *The Four Fundamental Concepts*, 83; 103.
46 See Eyal Weizman's account of the Irving trial in the introduction to this volume.
47 See Thomas Keenan, "Getting the dead to tell me what happened: Justice, prosopopoeia, and forensic afterlives" in this volume.
48 "The enumeration of objects forms the axis which, in a non-narrative and non-representational manner, performs a 'matter of fact' of the reproduction of ideology of genocide transforming it, as it does so, into a 'matter of concern.'" Grupa Spomenik, "Afterword," 25.
49 Seth Kim-Cohen, *In the Blink of an Ear: Toward a Non-Cochlear Sonic Art* (London: Continuum, 2009), 9.
50 Grupa Spomenik, statement for "The unperformable: Pythagorean lecture," performance, 2009, http://milicatomic.wordpress.com/works/pythagorean-lecture/.
51 Regarding the acousmatic voice, see also Mladen Dolar, *A Voice and Nothing More* (Cambridge, MA: MIT Press, 2006), 60–71. Regarding "*acousmatics*" as a "making resonant," as opposed to visual "making evident," see Jean-Luc Nancy, *Listening* (Fordham: Fordham University Press, 2007), 3.
52 Kim-Cohen, *In the Blink of an Ear*, xvi, 9. "In ancient times, the apparatus was a curtain; today, it is the radio and the methods of reproduction, along with the whole set of electroacoustic transformations, that place us—modern listeners to an invisible voice—under similar conditions" (10). This perceptual prescription takes its cues from Edmund Husserl's phenomenology, at the time influential in France, which dictated that in order for there to be eidetic or transcendental thinking, or the ascertaining of "essences," the phenomenological reduction (*epochē*) must suspend (i.e., bracket or place in parentheses) the observer's relationship to the external, empirical world of causes and effects, instead placing ontology prior to experience.
53 Grupa Spomenik, "Afterword," 24.
54 Ibid., 24–25.
55 Ibid.
56 Wagner, *To Know Where He Lies*, 13 and 101–07, esp. 106. This was discussed by the forensic DNA analyst Sejla Ibrizbegović during the lecture/workshop/discussion "The Role of DNA Analysis in the Indentification of Missing Persons," Editorial Board of the *Mathemes of Re-association Newspaper*, Belgrade, October 4, 2008.
57 Wagner, *To Know Where He Lies*, 121–22.
58 Ibid., 182–83.
59 Ibid., 187. For a detailed and nuanced discussion of the oscillation between the individual and collective elements of processes of burial and the religious factors involved, see 185–244.
60 Ibid., 216–17.
61 Ibid., 219–20.
62 Grupa Spomenik, "Artist's Intervention: Matheme," 72. In emphasizing the *remainder* here I gesture towards Jacques Derrida's insistent and forceful conceptualization of the remainder (or *restance*) as (nonlocatable) site of resistance.
63 "Introduction" to the *Mathemes of Re-association Newspaper.*

Case: Living Death Camps



Fig. 1. Living Death Camps, public forum organized by Grupa Spomenik/Forensic Architecture, 54th October Salon. Mechanical Workshop (German Pavilion), Staro Sajmište, Belgrade, October 5, 2013. Photo: Forensic Architecture.

Living Death Camps
Staro Sajmište / Omarska, former Yugoslavia, 1941–present

Living death camp is a syntagm that requires conceptualization. It was coined in order to name the condition of two former death camps in the territory of the former Yugoslavia, both of which are presently inhabited and used.

Staro Sajmište, or the Old Fairground, was built in 1938 on the outskirts of Belgrade to host international exhibitions and to present the Kingdom of Yugoslavia as a modern, industrialized, and technologically advanced nation. During World War II, following the German invasion of 1941, the fairground was transformed by the occupying Nazis into a death camp, where Jews, Roma, and political opponents were detained and killed. After the war, the remaining structures of the Sajmište complex became the residence of several generations of people—particularly those from the most vulnerable sections of society—and included artists' studios, workshops, small industries, and homes for a Roma community. Due to the urban expansion of Belgrade over the past sixty years, Staro Sajmište is now at the center of the city. Recently, another transformation of the site was announced: its conversion into a Holocaust memorial and museum. This plan threatens to displace the local communities that have made Staro Sajmište their home and workplace, and in living there effectively protected the site from demolition and redevelopment. The first evictions of residents began in the summer of 2013.[1]

Three hundred kilometers to the west of Belgrade, and across a border, lies the Omarska mine, near Prijedor in Bosnia and Herzegovina. Established in an area rich in iron ore, Omarska opened in 1985, in the time of socialist Yugoslavia. In 1992, the mine was used as a concentration camp and site of torture and execution by Bosnian Serb forces. Less than a decade after the end of the Bosnian war, the mine was acquired by ArcelorMittal, today the world's largest steel producer. The mining operations were relaunched in 2004 using the same structures and equipment that had been used during its time as a camp. There is no public marking of the events that took place there. Yet mass graves are still being discovered in the immediate vicinity of the mine, with hundreds of missing bodies remaining to be found.[2]

Living Death Camps names a collaborative project that seeks to investigate the complex material and political issues currently unfolding around these two sites, and to understand how the politics of commemoration in which each of them is embroiled reflects the current political situation in postwar former Yugoslavia.

Each of these sites has a complex and singular history, which we have undertaken to expose in our research. It is by addressing the specificity of each site that we sought to understand and intervene in the respective transformation of each site into a post-conflict site of commemoration. While clearly different, these two sites refract one another in various ways. After all, it was the memories of the World War II genocides that provided the conceptual matrix against which the atrocities committed in Omarska were measured, and which were later mobilized to justify NATO's military intervention in Bosnia and Herzegovina.[3] It could be said that the wheel has turned again. As a candidate country for accession to the European Union (EU), Serbia is today required to fulfill a long list of conditions, among which the adequate commemoration of the Holocaust sites on its territory. The Declaration of the Stockholm International Forum on the Holocaust of 2000 highlights the importance of upholding the "terrible truth of the Holocaust against those who deny it," and of preserving the memory of the Holocaust as a "touchstone in our understanding of the human capacity for good and evil." Every EU member or candidate country is required to put the principles defined in the Stockholm Declaration in practice within its borders. The current plan for a memorial in Staro Sajmište can be read as a direct response to this international requirement, as a stage in Serbia's EU application. Arguably, it also constitutes a convenient way for Serbian authorities to use the commemoration of World War II (in the context of which they see themselves as both victims and liberators) to divert public attention from the history of the Bosnian War. In this context, instead of providing a conceptual framework to understand some of its aspects, the history of Staro Sajmište could also operate to hide that of sites like Omarska.

Living Death Camps thus tries to navigate a risky terrain: to explore the connections between sites that history calls us to keep apart.

However different their specific histories may be, sites of catastrophe tend to "speak" to each other across time and geography. They refract one another's history as they create the terms by which contemporary notions of universality and humanity are established. Representations of the 1755 Great Lisbon Earthquake were for the eighteenth century what representations of the Holocaust were for the twentieth: they allowed people, across political boundaries, to share in the horror of these events and reconstruct the terms of their contemporary culture in relation to them.[4] Juxtaposing the histories of two living death camps is thus not an act of simple comparison; it is rather an attempt to study a single link in a chain of conceptual refractions between different sites of catastrophe, forming a landscape across which memory is articulated. Rather than create false parallels, or mask one catastrophe behind another, it is in the detailed examination of specific sites of atrocity that different historical cases become visible in different ways. Living Death Camps set out to investigate a particular condition which, through different paths, has emerged in both sites—that of an ongoing life in a former place of death. The problem that drove the project was to probe the apparent contradiction between commemoration, use, and the politics of the present.

Conventional models of commemoration require that a site where atrocities were committed be cleared, divested of all traces of present use, separated from the sphere of daily lives, sanctified, and even "sacrificed" to its violent past. In the contexts of Staro Sajmište and Omarska, the concept of *living death camp* is also a propositional challenge: one that starts from the acknowledgment that these two former death camps are presently inhabited and used, they are places upon which the lives of many depend. We argue that it is a necessity for each of these sites to develop a project of commemoration that would remain responsive to the demands of ongoing life.

In an attempt to engage with this necessity and the difficult questions surrounding it, our research has turned to some of the methods of contemporary archaeology. We have explored the multiplicity of events and processes registered in the materiality of each site, without an a priori focus on the historical layer that the death camp has left behind. One could say that we have attempted to adopt the point of view of matter itself: its objectivity in registering both tragic and banal events without making value judgments on their significance. The material entanglement of each site's historical layers forms the ground upon which a call for a simultaneous attention to its present and pasts can be made.

An inverted symmetry emerges from the research we have conducted in each of the two sites. In the case of Staro Sajmište, our fieldwork has permitted us to assemble a new forum. In Omarska, it is by convening a forum that we have gained access to a new field. This research and its outcomes are presented in the subsequent pages in the form of two image essays preceded by an introduction.

Staro Sajmište: The Inverted Horizon

In light of the City of Belgrade's project to establish a Holocaust memorial in Staro Sajmište, which would necessitate the eviction of some or all the current residents, we attempted to highlight what we saw as an unacceptable contradiction: a Holocaust memorial cannot be built on a forcefully cleared ground without immediately compromising its purpose. In order for such a claim to be articulated and heard, it needed to be made on a material basis.

Forensic archaeologist Dr. Caroline Sturdy Colls has, in recent years, developed a methodology of investigation that she refers to as "non-invasive." This involves using a range of complementary techniques, but it largely relies upon the sensing technology of Ground Penetrating Radar (GPR). This device transmits radar pulses into the ground to a depth of up to fifteen meters, and detects minute differences in the densities of the subsurface by recording the reflected signal. In the fuzzy three-dimensional model of the subsoil it produces, one can identify buried objects, voids and cracks, and other disturbances in the soil structure. Sturdy Colls uses this method to map and digitally explore the subterranean strata of historic sites, in particular those shaped by a history of violence.[5] We approached her in the spring of 2012 to work on an extensive survey of Staro Sajmište putting her in collaboration with ScanLAB Projects, a London-based practice that specializes in large-scale 3D data capture.[6] A singular image of the site at Staro Sajmište, above and below ground, has emerged from this collaboration.

Our survey has resulted in a report titled *An Archaeological Assessment of the Area of the Former Judenlager and Anhaltlager at Staro Sajmište, Belgrade, Serbia,* which analyzes the different structures, additions, and alterations that have accumulated on the site's thick ground. The report sought to unpack the history of the site as a process of ongoing transformation; it searched for historical and material continuities as well as ruptures. In this approach, all layers of the site, including and in particular those composed of its recent and present daily use, are regarded as archaeologically significant. Above all, the report demonstrates that Staro Sajmište's multiple historical layers are inextricably entangled, and mutually dependent.

On October 5, 2013, we convened a public forum inside one of Staro Sajmište's most infamous structures—the former German pavilion, which had served as accommodation for the camp's inmates during World War II. There we publicly presented our archaeological report, which served to provoke an open discussion about the future of the site.

The report confirms a counterintuitive fact: Staro Sajmište stands today thanks to its ongoing inhabitation, which has sustained it for the past sixty years. As Sturdy Colls put it in her presentation of the report:

> The role of the people who have been living here since the war should be duly acknowledged. Because in actual fact, the people who have lived in these buildings have played a role in preserving them. Many of these buildings wouldn't be here if people hadn't lived in them.

Not only did the residents of the site prevent its structures from degenerating into rubble—as happens after the long-term inoccupation of a building—but their number and distribution over the entire site has successfully hindered the realization of several redevelopment plans during the post-World War II period—which could have meant the destruction of the historical buildings to make room for a denser or more profitable urban quarter. Based on these findings, our claim—which we publicly put forward on the occasion of the public forum—was the following: rather than evict the people living and working in Staro Sajmište, the City of Belgrade has a duty towards them, and surely must include them as an active party in any future plan for commemoration.

The first transformation of Staro Sajmište from an exhibition ground into a concentration camp demonstrates a strange continuity between the two very different functions of the same compound—both made use of the same geometry of vision of pavilions around a central tower. The second transformation from a camp into a living neighborhood illustrates a concept that philosopher Giorgio Agamben describes as "profanation"—"restoring into common use" of those things that have been excluded, separated, bounded, put out of access and touch. Today's plans for returning the site to its original function—thereby completing a circuit that leads from a fairground through a concentration camp to a museum—would imply the re-sanctification of the site in the meaning of its exclusion from daily life. "Everything today can become a Museum," Agamben writes, "because this term simply designates the exhibition of an impossibility of using, of dwelling, of experiencing."[7]

An appropriate commemorative project for Staro Sajmište would include a plan to rehabilitate its homes and modernize its collective infrastructure, in order to support its potential as a common space. The concept of a living death camp would demand that any commemoration plan should see to the improvement of the living conditions of the communities that have turned this place into a neighborhood, and that have kept its material history alive.



Fig. 2. The newly built Fairground with Belgrade in the background, 1937.
Image courtesy of the Jewish Historical Museum, Belgrade.



Fig. 3. The ticket booths that marked the entrance to the fairground later became the entry gate to the Semlin Camp. Photo: ca. 1941, courtesy of the Jewish Historical Museum, Belgrade.

The construction of the Old Fairground complex began in 1936, following an initiative by Belgrade merchants who wished to create a center of industrial development in the city. The area selected to build the site was on the left bank of the Sava River, opposite the old Belgrade. Before construction began, this area was characterized by marshland and 126,000 square meters of land had to be drained to facilitate the building program.

The design of the complex, created by architects Milivoj Tričković, Đorđe Lukić, and Rajko Tatić, was based on a series of pavilions surrounding a central tower. Further pavilions of varying styles and sizes were constructed which were to be adopted to showcase the innovation of individual nation-states or private firms. The design also incorporated complex landscaping and a symmetrical road system.

The invasion of Yugoslavia by the German army took place on April 6, 1941. Restrictions were soon placed upon the Jewish and Roma communities, which escalated through four stages. The final stage—extermination—began following a rebellion across the country which started after June 22, 1941 (the date of the German invasion of Russia), with all Jewish men being imprisoned and then eventually shot by the German army's firing squads. The majority of male Jews had been murdered by the end of 1941 and the local Gestapo then turned their attention to the execution of women, children, and the elderly.

Judenlager Semlin opened on December 8, 1941, having been funded by the looting of Jewish property, and it operated as a Jewish and Roma camp until May 1942. The prisoner population within the camp was far from static as many died from illness, cold, hunger, and ill treatment. A systematic method of extermination involved a gas van loaded with inmates. The van, whose exhaust was to release fumes into the passenger compartment at the back, departed from the camp, then drove across the Sava bridge, through the streets of Belgrade, up to the mass graves dug in Jajinci where the bodies of the victims were dumped. In June 1942, the Nazis operating the camp reported back that "there was no longer a Jewish question in Serbia."

The site later became an internment camp for captured communists, partisans, chetniks, and other civilian "enemies." Very little has been written about Anhaltlager Semlin but it is known to have been designated a transit camp for laborers who were subsequently sent to various parts of Europe, most notably Norway, Germany, and other camps in Serbia; as such, some prisoners only stayed for a short time. For others, however, the camp became a place of execution and it is known that approximately 10,600 internees died between April 1942 and July 1944.

In architectural terms, the logic of visibility that dictated the layout of the exhibition ground, with visual axes converging on the central tower, also suited the panoptic regime of the camp. From the central tower, the entire camp could be visually surveyed. Consequently no major structural transformations were necessary to turn the exhibition ground into a concentration camp—even the high fence on its perimeter was conserved.



Fig. 4. Aerial image showing the Semlin Camp in 1944 (south of the westernmost bridge). The white dots mark the bomb craters resulting from the Allied bombing raids (after US Air Force 301st Bombardment Group). The extent of fig 5. is marked in the white rectangle.

Fig. 5. Aerial photograph of the Semlin Camp in 1944, showing the bomb craters of the Allied raids. Image courtesy of Jovan Byford.



Following the Allied bombing raids in April 1944, during which prisoners housed in the largest of the former Yugoslavian Pavilions were killed, the decision was made to transport the remaining prisoners to concentration camps elsewhere in Europe. The camp was "officially" abandoned on July 26, 1944, but it is known to have been used to house a group of forced laborers prior to their deportation in September 1944.

During the period 1947–1950 the site became the headquarters for the construction firm responsible for the building of New Belgrade. Some of the structures were repaired, while new structures were constructed to house the youth brigades who were to build roads.

Following the abandonment of the construction of New Belgrade, due to financial difficulties, some buildings were used to house the "economically disadvantaged," others were leased in 1952 to the Association of Fine Artists of Serbia (ULUS) which allowed individual artists to use the studios there. Additionally, Roma communities settled within or between certain buildings, some of which remain today.



Figs. 6–9. Scanning above and below ground, Staro Sajmište, October 2012. Photos: Steffen Krämer.

Methodological Consideration

It must be borne in mind that the site of the former camp has been for around sixty-five years, occupied by residents and businesses.

Therefore the techniques used and the areas surveyed as part of the archaeological investigation would likely be affected by a number of contextual considerations relating to this fact. As a result, a noninvasive methodology was employed to survey the area of the former camp. This methodology involved the collection and assimilation of documentary, cartographic, photographic, oral, topographic, and geophysical evidence relating to the period of the camp but also to its pre- and post-camp history. By using a range of complementary methods—drawn from archaeology, forensic investigation, historical research, heritage studies, and anthropology—it is possible to gain a deeper understanding of the landscape and the many layers it contains. Also, by using a range of complementary archaeological methods in the field, it is possible to characterize both aboveground and belowground features, and for the shortcomings of one technique to be compensated for by another.



Fig. 10. Staro Sajmište, extent of the area surveyed, 2012. Plan view of 3D Laser Scan data (brown/green) with GPR data (blue) integrated.

The features and areas discussed in the present excerpted version of the report are:

1. Central Tower (including areas A and B)
2. Italian Pavilion
3. Spasic Pavilion
4. Hungarian Pavilion
5. German Pavilion (including areas C, E, and I)

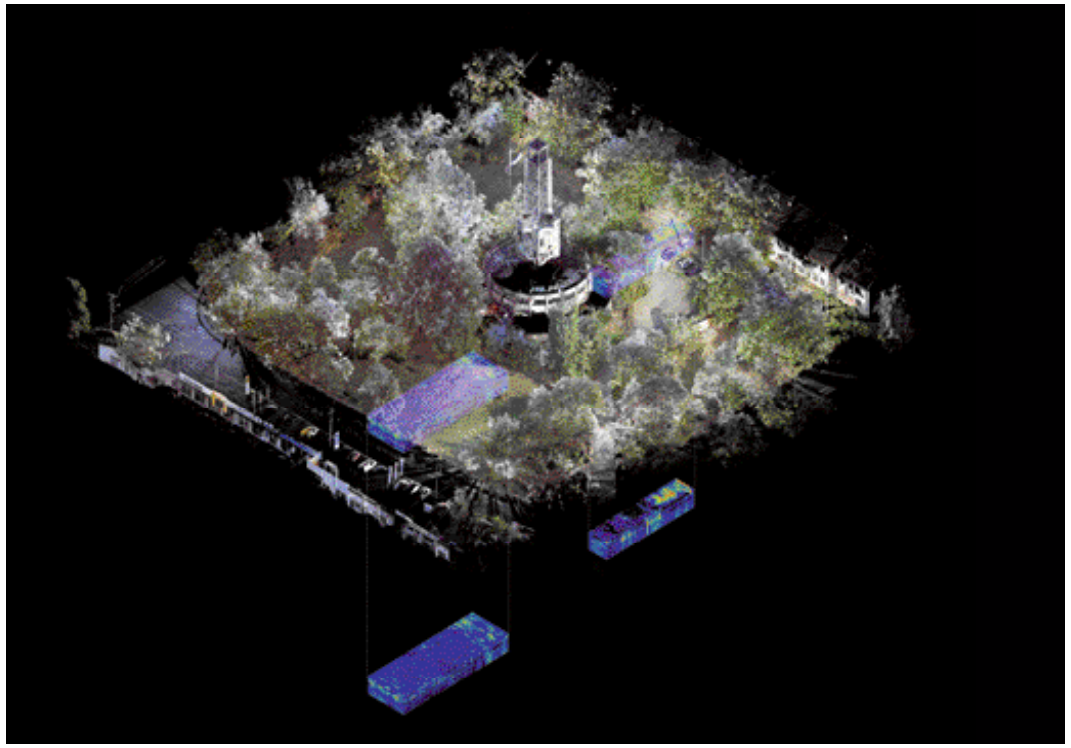




Fig. 11. (above) Central Tower, 2012. 3D Laser Scan data viewed in axonometric projection with GPR data integrated of Area A (left) and B (right). Image: Forensic Architecture/ScanLAB/Caroline Sturdy Colls.

Fig. 12. (below) Central Tower. Detail of surrounding area, 2012. 3D Laser Scan data viewed in aerial perspective. Modern gravel road and parking area corresponding to Area B. Image: Forensic Architecture/ScanLAB.





Figs. 13, 14. Traces of inhabitation on the Central Tower, 2012. Photos: Steffen Krämer.

Central Tower

The Central Tower was constructed in 1937 at the very heart of the Old Fairground complex. It could be, and still can be, seen from many vantage points in Belgrade and it was used as an exhibition pavilion. When the area was taken over by the Nazis for the creation of the Semlin camp, the Central Tower reportedly housed the camp administration and it would be the place where camp inmates would register. After the war, the tower became the head office of the Youth Brigade, before being handed over to artists in the 1950s for use as studios. Many prominent Serbian artists worked here and, for many of them, the tower also became their homes. The Central Tower was the first location from which evictions began in 2013 and it now stands empty.

Use of laser scanning allowed a 3D record of the tower to be created. The tower is now dilapidated, with both cosmetic damage to its exterior and likely structural weaknesses to its fabric. Despite its many uses, the structure has maintained its original form with additions to its exterior in the form of small porches erected by its residents. The glasswork which adorned the upper parts of the tower has long since gone, leaving only the bare shell of the structure.

A GPR survey was undertaken in two strips in the area around the tower. In addition to the aboveground laser scanning undertaken, these two strips were intended to capture the various subterranean layers relating to the tower. Fig. 11 shows the GPR data and the relationship between the aboveground and belowground scanning. The modern gravel road and parking area can be seen in Area B. No archaeological features of note were recorded in these areas.





Fig. 15. (above) Italian Pavilion, interior courtyard of artist studios, 2012. 3D Laser Scan data viewed in perspective plan. Image: Forensic Architecture/ScanLAB.

Fig. 16. (below) Italian Pavilion, 2012. 3D Laser Scan data viewed in aerial perspective. Image: Forensic Architecture/ScanLAB.



Fig. 17. The Italian Pavilion, 1937. Image courtesy of the Jewish Historical Museum, Belgrade.



Fig. 18. Interior of an artist studio, located in the Italian Pavilion, 2012. 3D Laser Scan data viewed in perspective. Image: Forensic Architecture/ScanLAB.

Italian Pavilion

The Italian Exhibition Hall was constructed in 1937. It is located near to the entranceway to the Old Fairground/camp. This building came to be used as the camp's food store and also housed a joinery. The use of this building for such a purpose likely relates to its size and location; its proximity to the camp gate and administration building would have allowed food supplies to be carefully monitored, and it was close to the buildings used to house the inmates and the kitchen.

Laser scans of the exterior of the building reveal its complex architecture. Two columns mark the entrance to the structure, which is almost triangular in plan, although its frontage is curved. Rooms are located around the edges of an open central courtyard area. When it was constructed, it appears that the exterior of the building was rendered and painted. The original windows that defined the exterior of the structure survive but, once again, in a poor state of preservation. This building is now used as artist studios. Laser scans of the insides of one of the artist studios were collected in order to create a lasting record of this particular layer of this building's history (Fig. 18).



Fig. 19. Spasić Pavilion, 2012. 3D Laser Scan data viewed in axonometric projection. Image: Forensic Architecture/ ScanLAB.



Fig. 20. Camp hospital (Spasić Pavilion), 1941. Image courtesy of the Jewish Historical Museum, Belgrade.

Spasić Pavilion
Constructed in the first phase of the Old Fairground building works, this building was known as the Spasić Pavilion and was a private pavilion for the eponymous company. After the Judenlager opened in 1941, it appears to have taken several months for the pavilion to be converted into the camp hospital.

The hospital was located opposite the camp mortuary and bath house, which was established in the former Turkish Pavilion. Hilda Dajič recalls how she had to take the bodies of those who died in the hospital across to the mortuary and pile them up before they were taken for burial.

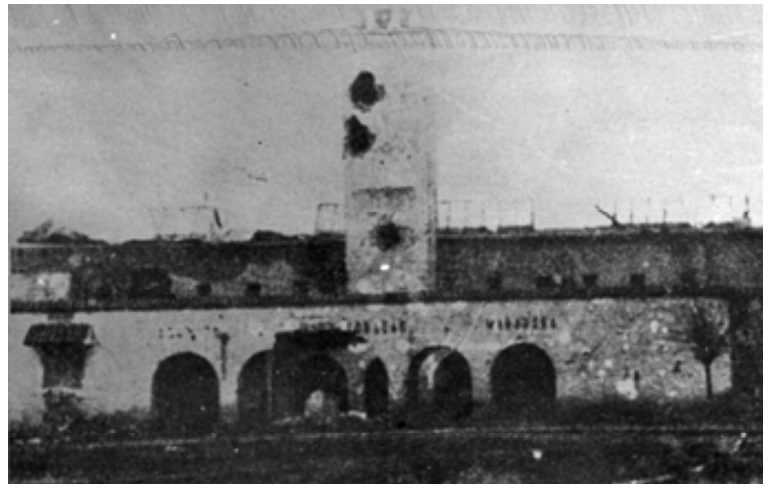
After the war, this building became the headquarters of the building operation that was tasked with the construction of New Belgrade. In the years that followed it remained as offices, before becoming a concert hall. Local protests within Serbia did not prevent a concert by Boy George from going ahead in this building but the site attracted international attention when British band Kosheen were scheduled to appear there in concert in 2007. Although this concert was cancelled and promises made regarding a commemoration and regeneration strategy for the area, the function of this building did not change, other concerts went ahead and such a plan has yet to be implemented.

The building is now used as a gym and has an outside drinking area to the east. This structure has been modified internally and externally but it survives in a relatively good condition compared to many other structures pertaining to the camp. A rectangular structure has been built close to its eastern facade.

Fig. 21. Residences (Hungarian Pavilion), 2012. 3D Laser Scan data viewed in aerial perspective. Image: Forensic Architecture/ ScanLAB.



Fig. 22. Southern façade of the Hungarian Pavilion, which became a place where inmates were executed in Semlin Camp, 1941. Image courtesy of the Jewish Historical Museum, Belgrade.



Hungarian Pavilion
The Hungarian Exhibition Hall dates to 1937 and was built during the first phase of the Old Fairground's construction. Its architecture was characterized by a series of arches along its southern facade with a rectangular tower at its center. A rectangular annex abutted this to the north. The building was to become a place where inmates of the Semlin camp would be executed following its appropriation by the Nazis. Witnesses report that hangings and torture occurred here regularly.

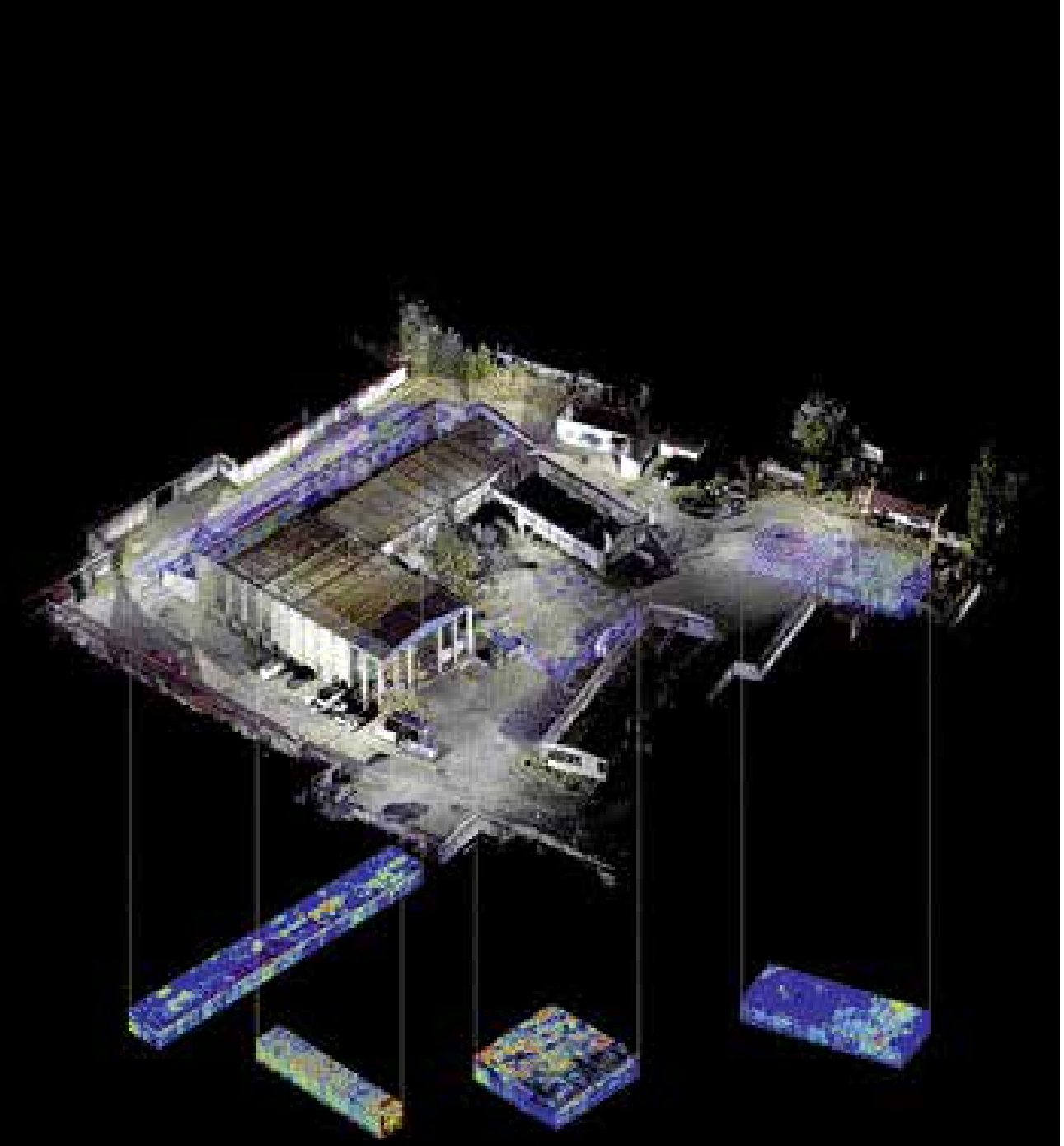
After the war, the southern facade was removed, likely due to the damage to the tower that occurred during the bombing of Belgrade in 1944. In 1948, the building was converted into a kitchen for the Youth Brigades who were tasked with construction in Novi Beograd (New Belgrade). Only the rectangular rear portion of the building now survives, to an extent of approximately 37 x 17.5 m, and it has been converted into residential properties. A mechanics workshop is located on its western side. The entire structure is currently very dilapidated and its exterior is characterized by damaged yellow-cream plaster.

Fig. 23 (left). German Pavilion, 2012. 3D Laser Scan and GPR data in axonometric projection. The foundations of parts of the building, since destroyed, and the sewage system connecting the various ruins are visible in the subsoil. Image: Forensic Architecture/ScanLAB/Caroline Sturdy Colls.

Fig. 24. (right, above) German Pavilion, 1937. Image courtesy of the Jewish Historical Museum.

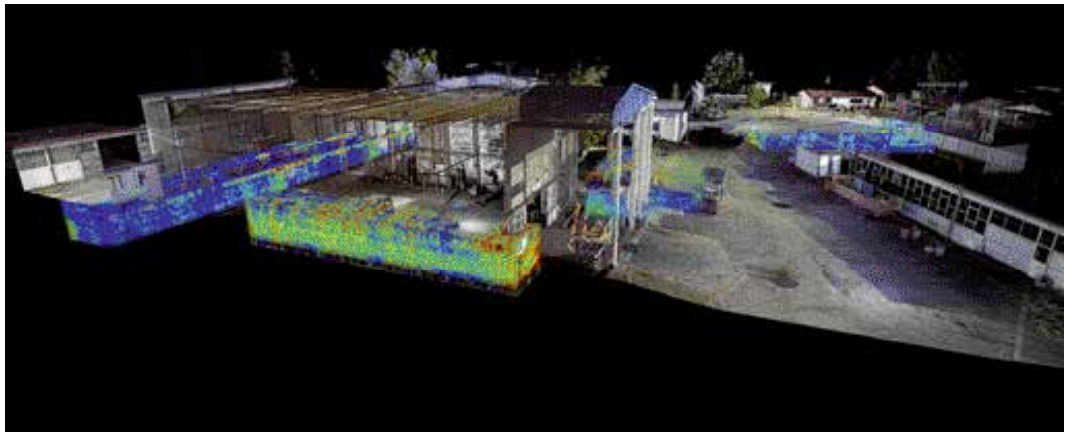
Fig. 25. (right, below) Interior of mechanical workshop (German Pavilion), 2012. 3D Laser Scan data viewed in perspective. Image: Forensic Architecture/ScanLAB.

Fig. 26. (below) German Pavilion, 2012. Vertical section through 3D Laser Scan data with GPR data integrated. Image: Forensic Architecture/ScanLAB/Caroline Sturdy Colls.



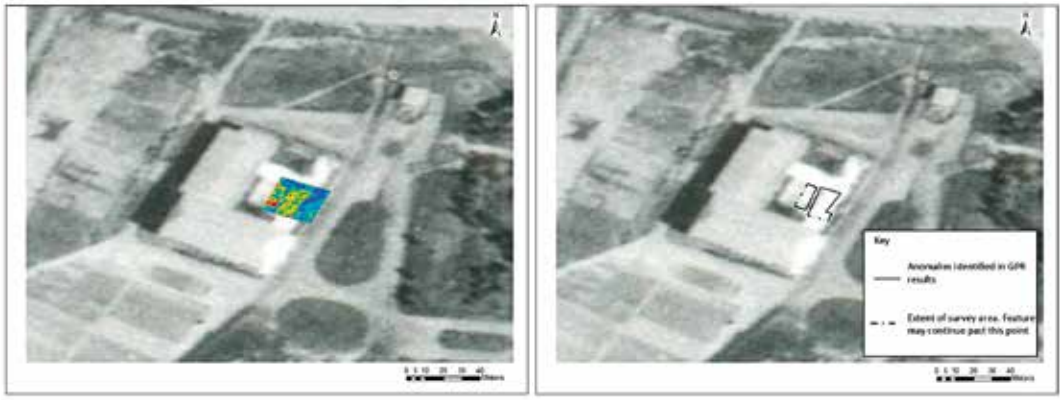






German Pavilion
The German Pavilion was built in the later phase of the Old Fairground's construction in 1938. Historical images of the pavilion show it adorned with swastikas as, during the Old Fairground period, it was used as a propaganda tool to show the strength of Nazi Germany. Somewhat ironically, these adornments were removed to make way for a much more basic interior when the building was converted for use as living quarters for the camp inmates from in 1941. It was to retain this function until the camp's abandonment in 1944.

The exterior and interior of the pavilion were recorded through laser scanning. These laser scans allow the prewar, wartime, postwar, and modern uses of the structure to be recorded in digital form. The pavilion is now used as a mechanical workshop and is not accessible other than by the permission of the owner, which was granted to facilitate the laser scanning. Although the modern use of the structure has resulted in modifications to it and its surroundings, it was possible to identify a number of original features.



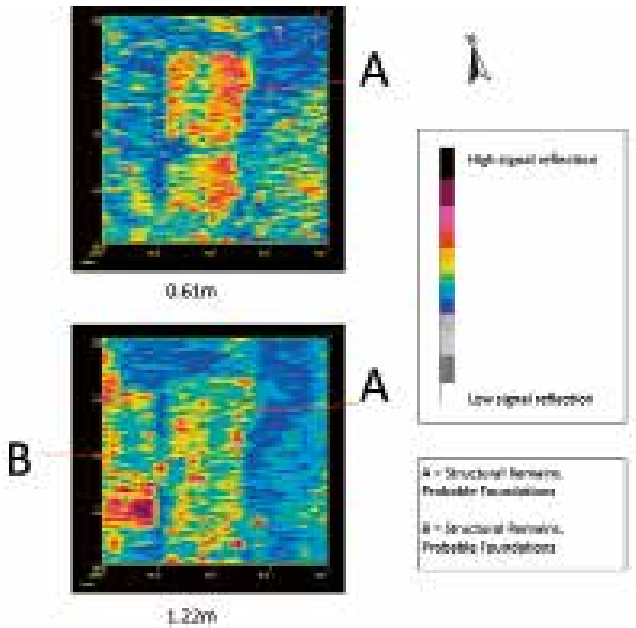


Fig. 27 a, b. GPR results for Area C overlaid onto an aerial image of the former German Pavilion/Living Accommodation for Camp Inmates taken in 1944. Aerial image courtesy of Jovan Byford. Image: Forensic Architecture/ Caroline Sturdy Colls.

Fig. 28. Survey Area C, vicinity of German Pavilion, 2012. GPR data viewed in plan, at two different depths, analyzed and marked. Image: Forensic Architecture/ Caroline Sturdy Colls.

The original German Pavilion was L-shaped in plan and this building survives in the modern landscape (fig. 10). Recent additions to the structure means that is in now a linear U-shape in plan (fig. 23). An aerial image from the mid-1940s suggests the presence of additions to the east of the original structure when the camp was in operation, as shown in fig. 27 (a,b). However, no such structures are currently visible aboveground and this area is now a flat, concreted area used as a parking area for vehicles (fig. 23).

As a result, a GPR survey was conducted over an area of 20 x 20 m, marked as Area C in fig. 28, to try and establish whether buried structural remains survived. This revealed the presence of two subterranean structures. The first, measuring approximately 6 m wide, was visible from a depth of 0.56 cm and extended the full depth of the survey (approximately 5 m) (fig. 28, marked A). It was visible to an extent of 15 m in length but it's possible that it continued outside of the survey area to the north and south.

The second feature, measuring approximately 13.5 m, was visible from a depth of approximately 0.84 cm to 2 m. Its visible width was approximately 5 m but it is likely that it continues to the east (fig. 28, marked B).

When the GPR results were overlaid (in GIS) onto an aerial image of the area dating to 1944, it became apparent that these features represent the remains of two structures built during the camp period. The exact function of these extensions to the pavilion within the camp is unknown. Certainly they formed part of the living accommodation for camp inmates in this area but it is not known whether inmates slept in these structures or whether they were used for alternative purposes. The depth of Feature A suggests that it has a cellar, now in-filled. A plan of the site from 1985 demonstrates that Feature B was still present at this time but no aboveground traces remained here by the time satellite images of the site were collected in 2001.

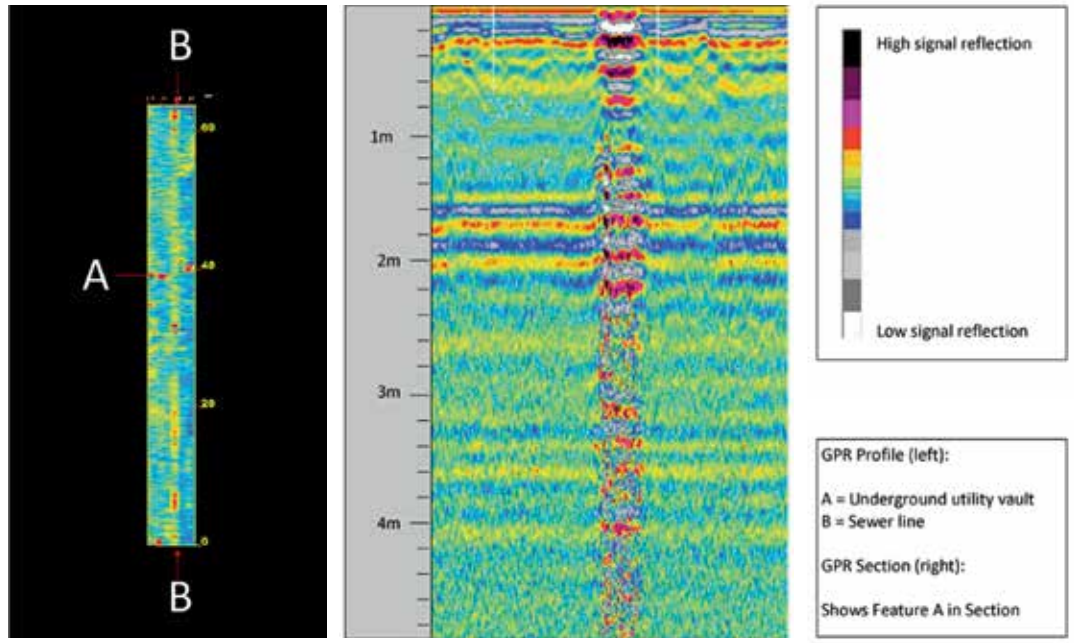


Fig. 29. Survey Area E, vicinity of the German Pavilion, 2012. Annotated depth plots of GPR data viewed in plan (left) / Feature A viewed in section (right). The layers in this image are referred to as "horizons." Human intervention—here a sewage pipe—is registered as an interruption in the otherwise even stratigaphy. Sewage lines are important archaeological features because by following their network one can identify buildings constructed in the same period. Image: Forensic Architecture/Caroline Sturdy Colls.

The area to the rear of the former German Pavilion/living accommodation for camp inmates was also surveyed due to the fact that this would have been an area of open land during the camp's period of operation. An area, measuring 7 x 6.5 m, was surveyed using GPR. An underground utility vault was identified, providing access to a sewer which existed on a NNE-SSW alignment. This sewer line was likely installed when the German Pavilion was built and, as such, would have formed part of the camp infrastructure.

As mentioned above, a considerable number of buildings have now been built in the area that was formerly open space around the German Pavilion, obstructing the possibility of a full scan survey.

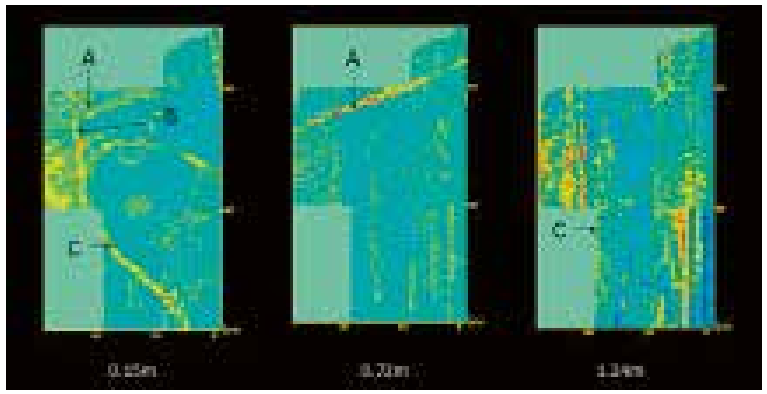


Fig. 30. Survey Area I, 2012. Annotated depths plots of the GPR data viewed in plan. Image: Forensic Architecture/ Caroline Sturdy Colls.

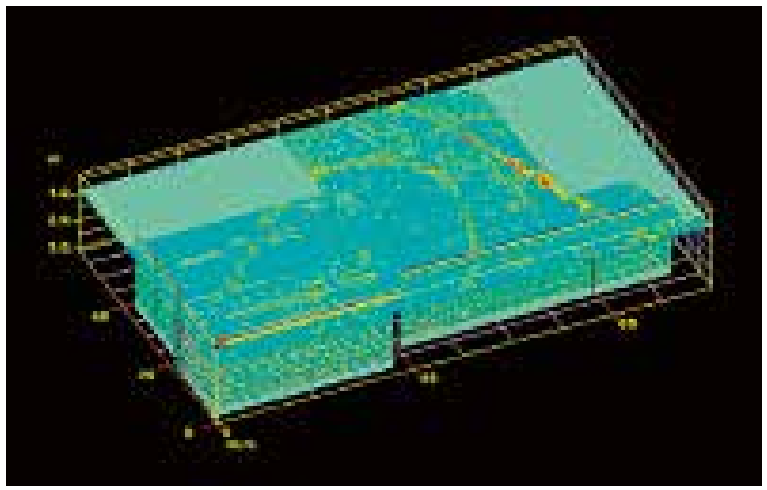
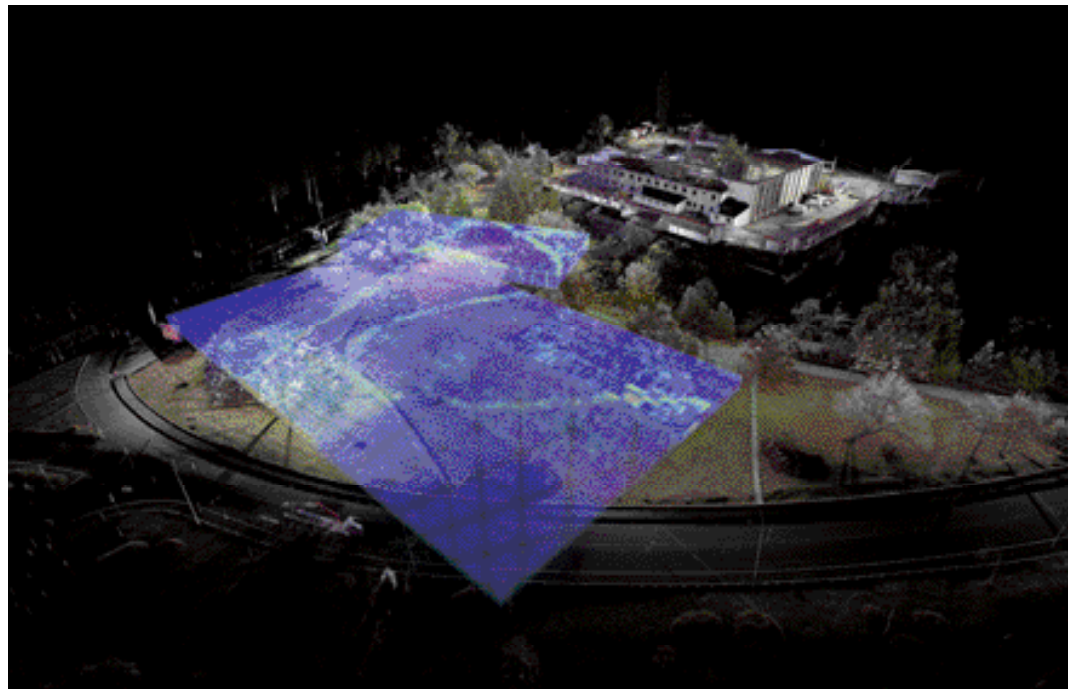


Fig. 31. Survey Area I, 2012. Depth of GPR data as visualized in GSSI RADAN software. Image: Forensic Architecture/ Caroline Sturdy Colls.



Figs. 32, 33. (above and overleaf) Survey areas I and J, 2012. 3D Laser Scan data viewed in aerial perspective, with GPR data integrated. Image Forensic Architecture/ScanLAB/Caroline Sturdy Colls.

Survey Area I

It is anticipated that, for the camp guards to have disposed of victims locally, they would have had to bury the victims in the open areas surrounding the buildings or by the riverside. As part of the archaeological investigation those areas which were open areas at the time that the camp was in operation were identified. Of these, the areas which remained accessible were examined using GPR to determine whether any features consistent with mass graves were present or whether any other features associated with the camp survived.

The GPR revealed a number of features. In Area I, Feature A (fig. 30) bisects the survey area from east to west and likely represents a pipe. A notable ditch on the same alignment is visible on the surface in this area, leading to and from manholes. Feature B is a modern path which bisects the grassed area in which the survey grids were located. Feature C is visible from 0.10 m deep and is present as an area of medium reflection until approximately 0.72 m. As shown in fig. 30, it returns as a low reflection feature at approximately 1.24 m. No visible trace of this feature, e.g., vegetation change, is evident on the current ground surface. It seems likely that this feature represents some form of back-filled ditch but its purpose is unclear. It is possible that it is a trench dug out during the period of the camp. It could also be an infrastructural feature. Another speculation is that it could represent an older archaeological feature, because its form and depth are consistent with ancient forms of inhabitation. None of these speculations could be verified without excavation. This feature demonstrates the probabilistic nature of finds in the subsoil. Whereas aboveground, objects have distinct borders, materialities, and forms, in the ground their form, while identifiable, tends to be less tangible, with data representing variable anomalies in the subsoil. Therefore, non-invasive surveys require comparison with other non-materially-invasive historical sources such as plans and historical or aerial photographs.

Many areas that would have been suitable for use by the Nazis as burial locations have since been built over or obstructive vegetation prevented access; thus, in this case it is subsequent developments which have inhibited the search, not only the Nazis' attempts to hide their crimes. The presence of mass graves in and around the camp area can, therefore, not be ruled out. It is possible to say that none were located within the areas surveyed but it is possible that human remains exist elsewhere. Many key areas along the riverbank and in the area around the former German Pavilion have not been surveyed but, based on the results of the desk-based assessment, still represent potential disposal sites.

In addition to the in-field survey, local residents and workers were consulted when possible to determine whether any remains had been encountered during the construction of those buildings constructed within their lifetime in these inaccessible areas. One resident reported that he had found bone fragments in his garden while planting vegetables, which is in the vicinity of the former execution sites (former Ribarski and Hungarian Exhibition Halls) and living accommodation for inmates (former Philips Pavilion). Workers who built many of the temporary structures surrounding the former German Pavilion, which was used as living accommodation for camp inmates, also reported finding skeletal remains while excavating the foundations for these structures.

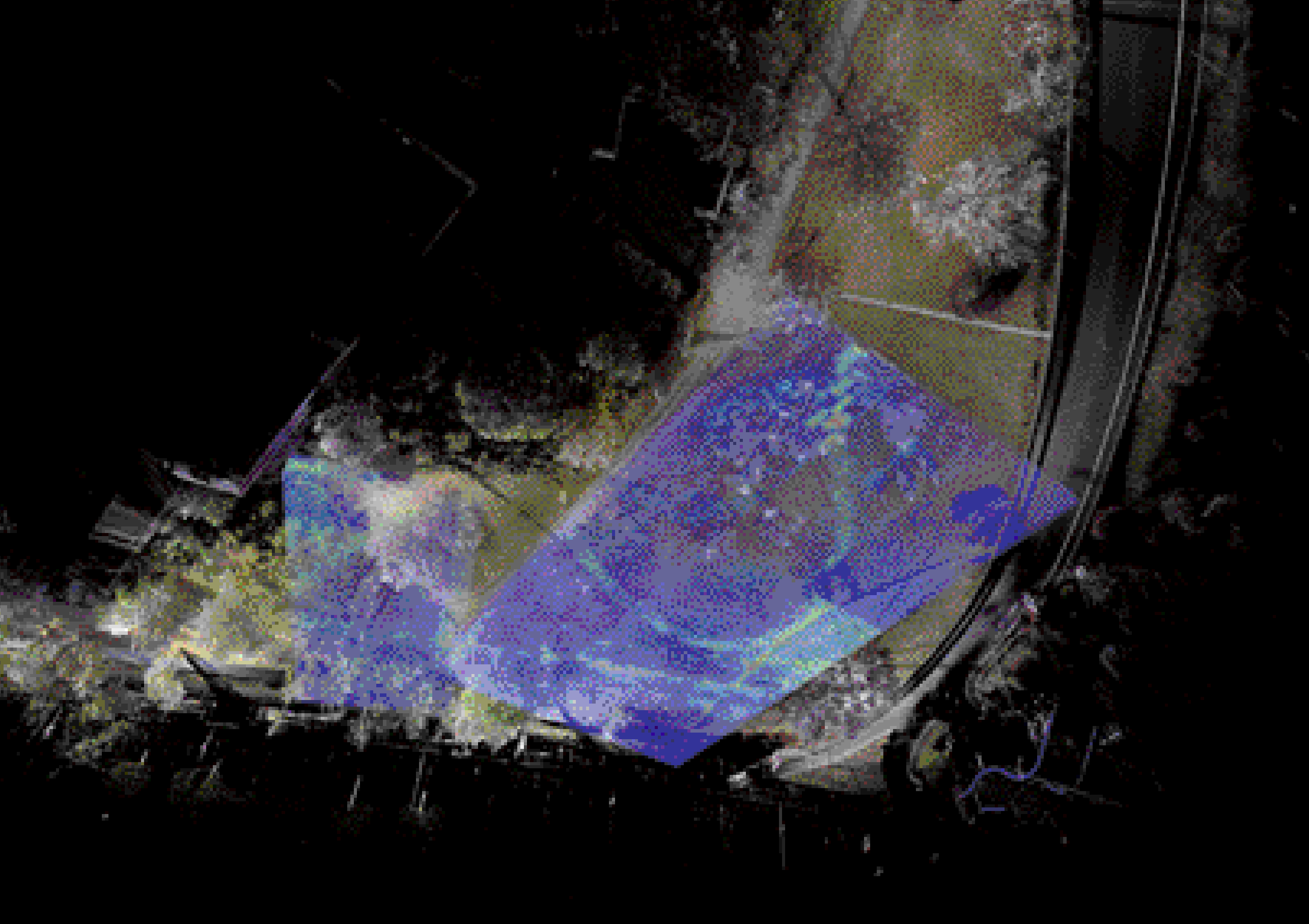




Fig. 34. (above) Omarska mine, Bosnia and Herzegovina. Aerial photograph annotated by witness, entered into court records in the International Criminal Tribunal of the former Yugoslavia, July 26, 1996.

Omarska: Memorial in Exile

In 2005 ArcelorMittal made a commitment to finance and build a memorial on the grounds of Omarska, the site of the most notorious concentration camp of the Bosnian war. Two decades later, no resolution as to how to commemorate the tragic events that took place on its grounds have been found.

In a chance meeting near the mine, Director of ArcelorMittal Prijedor Mladen Jelačˇa, proudly confirmed to us that the ArcelorMittal Orbit, the towering symbol of the London 2012 Olympics, was being fabricated with iron ore that came from the Omarska mine. This material link between London and Omarska—between a site where crimes against humanity were committed and another that celebrated that same universal humanity—formed the basis of our collective project. On July 2, 2012, shortly before the opening of the Olympics, we hosted a press conference in the immediate vicinity of the Olympic park. With the participation of survivors from the Omarska and Prijedor camps, we reclaimed the ArcelorMittal Orbit as the Omarska Memorial in Exile.[8]

Prijedor is in the region that is referred to, after the Dayton Peace Agreement, as Republika Srpska—an area whose demographics were dramatically affected by the war and where ethnic cleansing was the most intense and successful. Bosnian Muslims we spoke to, who had returned under the agreement, complained of daily harassment and continued discrimination. Today the local municipality of Prijedor has a hard-line Serbian mayor in Marko Pavic, who exemplifies the culture of denial that persists in the region. Ethnic divisions are once again manifest in the lines separating those with the desire to see a memorial and those with the desire to prevent its appearance. While ArcelorMittal claims it is fully aware of its responsibilities towards the local community and its employees, the mine's postwar workforce is comprised almost exclusively of Bosnian Serbs.

ArcelorMittal insists on "not taking sides in this debate without engagement or prior agreement of the local communities and local/international stakeholders concerned."[9] Not taking sides in an area where persecution and injustice continue is not an act of neutrality but constitutes a political position by default. Not taking sides maintains the impasse of the present and forecloses the possibility of moving forward. Not taking sides means the perpetuation of violence by other means. With no space of collective public mourning to confront the wounds of the past, survivors must endure their pain and trauma in private. Through the Memorial in Exile project, we aimed to raise public awareness of this material amnesia, and to put continued pressure on ArcelorMittal—demanding that it use its enormous influence to facilitate the entrance into public discourse of the history of the Omarska death camp.

Twenty years after it first emerged in the public sphere, the case of Omarska regained considerable public attention through our project.[10] It may be that this contributed to bringing about a significant softening in ArcelorMittal's policy regarding public access to the site.[11] As a consequence, our team was granted access to the Omarska mine on October 3, 2012, to conduct a detailed photographic and 3D laser-scanning survey of the notorious White House. In 1992, this rather banal-looking one-story pitched-roof house functioned as a place for the torture and execution of inmates. Witnesses who testified in the International Criminal Tribunal for the former Yugoslavia (ICTY) described an accumulating pile of bodies rising in a deadly mound beside it. [12] Due to its involvement in several proceedings of the ICTY, the White House is the only inoperative structure in the mining complex, and has been conserved in a relatively untouched state since its use in the camp. It was also the site chosen by ArcelorMittal to build a memorial in a 2005 project that was later abandoned.

3D laser-scanning technology allowed us to capture a millimeter-perfect model of the interior, exterior, and immediate surroundings of the White House. The level of detail it provides allows one to identify features that are hardly visible to the naked eye, such as the footprint of a boot on an interior wall, but also remnants of improvised attempts at commemoration. The capture of this model constitutes a future-oriented archive. Considering the planned cessation of the ICTY's activities at the end of 2016, the fate of the White House in the coming years is uncertain. Access to such a significant place of mourning for the relatives of the camp's victims still remains highly restricted today. In the context of the ongoing negotiation of a commemorative project for Omarska, this singular three-dimensional archive has the potential to be mobilized in unexpected ways.



Fig. 35. First presentation of the *Four Faces of Omarska* concept. Milica Tomic's exhibition "One Day," Salon of Museum of Contemporary Art, Belgrade, Serbia, 2010.



Fig. 36. Working Group Four Faces of Omarska, Public Working Meeting "How to Think Memorial," *Where Everything is Yet to Happen*, SpaPort Biennial, Banja Luka, Bosnia and Herzegovina, 2010.

Pavle Levi, a film theorist, writer, and member of Grupa Spomenik in 2009, opened up important issues about the ethics and politics of the visual in his article "Kapo from Omarska." In his critique, he took as an example the 2007 film *St George Slays the Dragon,* directed by Srdjan Dragojevic´, which was shot on location at Omarska. Levi critiques cultural production in Serbia that participates in the revisionism, negation, and erasure of historical events from the 1990s, especially those concerning ethnic cleansing, terror, and concentration camps. He initiated his critique with the sentence: "I have not seen the film *St George Slays the Dragon*—nor will I see it." [13] Levi's text opened up a crucial space of critique and political thinking, one that demanded a different type of filmmaking, a different visual response to the immanent conditions of historical violence. While Omarska is a site where terror was systematically perpetrated against non-Serbians, in using a former extermination camp as a film set—specifically to narrate the suffering of Serbs during World War I—the director effectively annulled the history of terror that actually took place there. Levi's concept text and his ideas around the concept film served as a trigger for the emergence of the Working Group and Four Faces of Omarska concept.

Since March 2009 the Working Group Four Faces of Omarska has undertaken long-term research and interventions at Omarska. In April 2012 Four Faces of Omarska invited Forensic Architecture to go on a research trip with them to Bosnia and Herzegovina. On July 2, 2012, Four Faces of Omarska and Forensic Architecture organized a press conference in East London at which they declared the ArcelorMittal Orbit a *Memorial in Exile.* This documentary emerges out of these events.

Next pages: Storyboard version of the *Memorial in Exile* video (2013). Realized by Susan Schuppli and Steffen Krämer. A project by Forensic Architecture, Working Group Four Faces of Omarska, and Grupa Spomenik.



Narrator 1: It's September now, five months after our initial visit, and it's still overcast. It is this constant moisture that gives limonite its particular name—derived from the Greek word for meadow—because of its frequent occurrence in bogs and marshes. While limonite is amorphous, a number of minerals will decompose to produce it without losing their own unique crystal shape. As such limonite is a carrier of form, but has no distinctive form itself. It is matter in potential … a becoming-structure of formless matter.



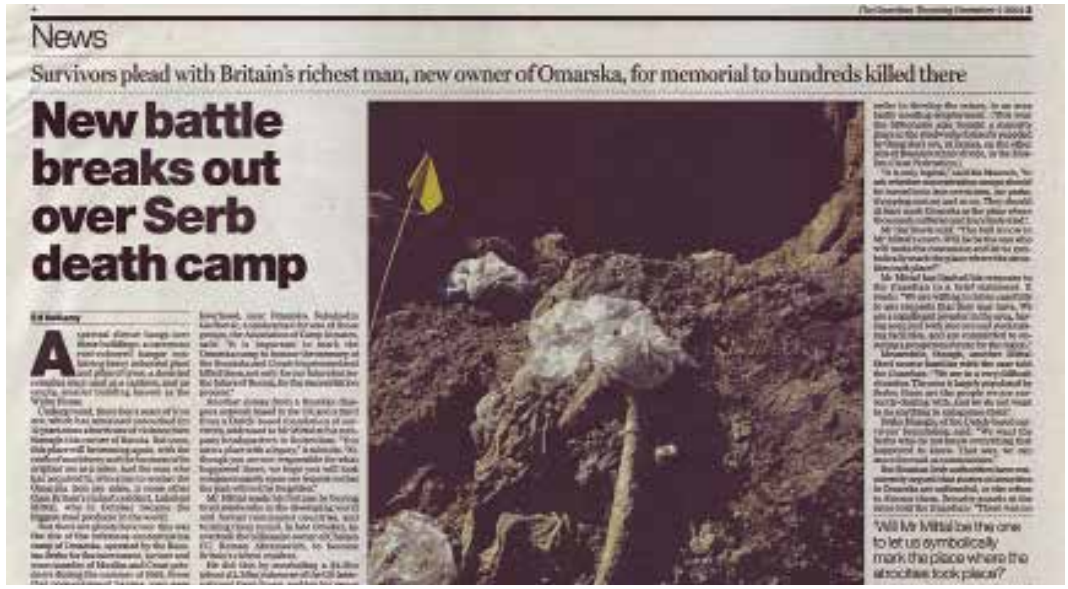
Narrator 2: As a source of ancient smelting and metallurgical practices, limonite has been mined in this region for more than two thousand years, starting with the Phoenicians and Illyrians. The Romans were said to have excavated and smelted iron ore here for over four hundred years, transporting bars of metal by the rivers of the Sana, Una, Sava, and Danube. According to recent geological assessments there are still some 347 metric tons of limonite and carbon-ore reserves in the river valleys of the Sana, Una, and Gomjenica, between the mountains of Kozara and Grmec. Metal is everywhere in this region of Bosnia.



Narrator 2: In 2004, ArcelorMittal assumed 51 percent ownership of the Ljubija mining complex in Prijedor, Republic of Srpska, Bosnia and Herzegovina, an acquisition that included the Omarska mine. In 2005 ArcelorMittal made a commitment to finance and build a memorial on the grounds of Omarska, the site of the most notorious concentration camp of the Bosnian war.



Twenty years after the war crimes committed there, still no space of public commemoration exists. Ground, buildings, and equipment once used for extermination now serve a commercial enterprise run by the world's largest steel producer.



News

Survivors plead with Britain's richest man, new owner of Omarska, for memorial to hundreds killed there

New battle breaks out over Serb death camp

Ed Vulliamy

A spectral silence hangs over these buildings: a cavernous rust-coloured hangar containing heavy industrial plant [*sic*] and piles of tyres; a deserted complex once used as a canteen, and an empty, smaller building known as the White House. Underground, there lies a seam of iron ore, which has remained untouched for 12 years since a hurricane of violence blew through this corner of Bosnia. But soon, this place will be teeming again, with the rattle of machinery and the business of its original use as a mine. ("New Battle Breaks Out over Serb Death Camp," *Guardian*, December 2, 2004.)

"Will Mr Mittal be the one to let us symbolically mark the place where the atrocities took place?"



Press release, June 29, 2011: ArcelorMittal confirms that the 2,200 tons of steel being used in the ArcelorMittal Orbit—London's Olympic tower—will contain symbolic quantities from every continent in the world where the company has operations, reflecting the spirit of the Olympic Games, which draws together athletes from across the globe.



Ed Vulliamy: When word of ArcelorMittal's purchase first came to light, the specter of buried bodies and even potential mass graves was immediately raised. Work has just concluded at one mass grave only two miles from the Omarska site, from which the remains of 420 men murdered in the camp were retrieved. In October 2001, another mass grave containing 353 bodies was found within another mine in the Ljubija complex. "There is no doubt whatsoever that there are bodies as yet unfound within the mine of Omarska and its vicinity," said Amor Masovic, president of the Bosnian government's Commission for Tracing Missing Persons, which exhumed the graves. "We are not talking about dozens of bodies here, we are talking about hundreds." ("New battle breaks out.")



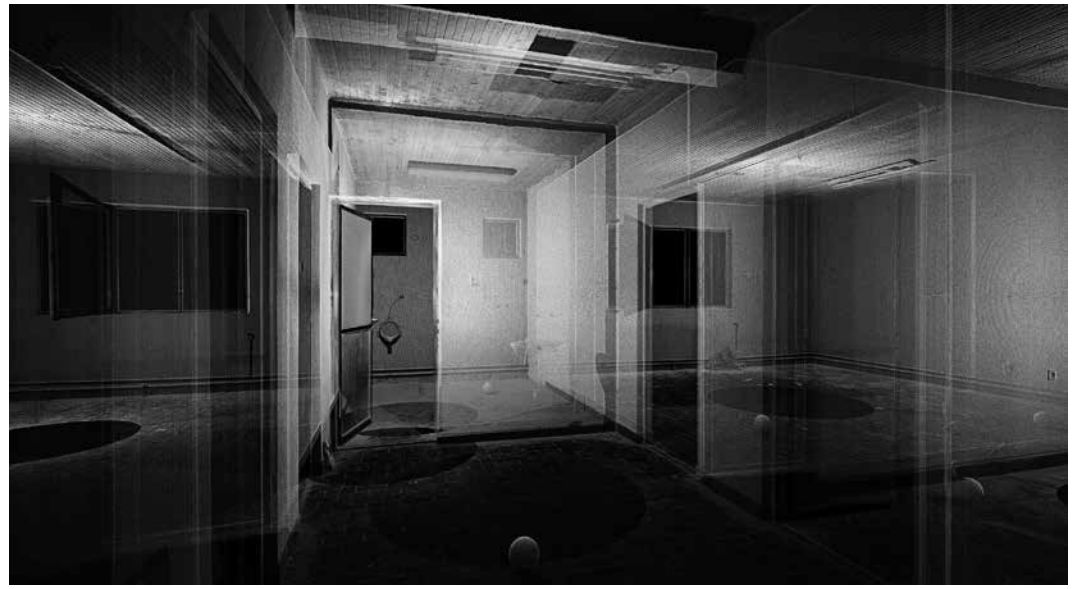
Narrator 1: The story that links London to Omarska forcefully came to my attention when a group of us, including survivors, drove around the perimeter of the Omarska mining complex in April 2012. At a certain point we pulled off to the side of the road where a white building was barely visible in the distance. Anxiety mounted as we lingered to talk and take some pictures, the survivors fearful that this unauthorized stop might make future access to the site even more difficult.



Milica Tomić: In a chance meeting on the fourteenth of April, 2012, the director of ArcelorMittal Prijedor made a rather disturbing revelation. "Mladen Jelača said that parts of the Mittal Orbit will be made from Omarska resources. He was very proud. He also said that metal (iron ore) is being taken out from three different mines in Europe. One of these is Omarska."



Narrator 1: So it is here, to Omarska, that we have returned these months later. Now with official permission to photograph the White House. Most who entered the White House during 1992 were never seen again. Witnesses who testified in the International Criminal Tribunal for the former Yugoslavia, described an accumulating pile of bodies rising in a deadly mound beside it. Some contend that the subterranean deposits of iron ore still carry the decomposing remains of victims and that oxides have been hydrated with their blood, producing the ore that is limonite.



Narrator 1: Scanning the surfaces of the White House, our camera's high-resolution sensors are charged with the task of documenting history, searching for residual clues that might somehow disclose the violence unleashed in this now rather prosaic place. What trace effects might linger in the surface grain of plaster and paint, now captured by electronic pixels? Can images be made to speak—to testify—on behalf of events that precede them?



ICTY Transcript 021030ED: Do you recall a number of people from Benkovac who were in the White House? A. Yes, I do. On the twenty-fourth of June when I was brought to Omarska, I spent my first night in the White House. The second room on the right as you go in. There were forty-three people inside, plus the eight of us who had just arrived. That's fifty-eight persons all together. I recognize Bahrija Foric, a young man from Kamicani. My father worked as a teacher in Kamicani, so I had known that lad from when I was—we were both very young. He had been badly beaten. And he was the only one who was allowed to lie down because his kidneys had been broken. The forty-three of them and two women, I know of two women for sure, there was Sadeta Medunjanin, and they left—were set for an exchange in the direction of Bihac. So forty-three men and two women. I can't remember the last name of the other one, but the name of the first woman was Sadeta Medunjanin. Because that day when they were taken away, the local barber did one of those women's hair. And then one of the women's husbands was my secretary and the other's son lived in the White House and all she said was, "Maybe my nana will come out at some point."



Narrator 2: Rising to the soaring height of 114.5 meters and outstripping even the Statue of Liberty by two meters, the ArcelorMittal Orbit boasts an impressive compendium of statistics: 1,500 tons of steel, 35,000 bolts, 19,000 liters of paint, 770 visitors per hour and 5,000 per day, vistas stretching 20 miles into the distance, and a overall price tag of £22.7 million, £19.6 million of which was funded by ArcelorMittal.



Narrator 2: Another series of facts: 3,400 Bosniaks and Croats from Prijedor went missing or were killed during 1992, the summer of the massacre. At least 3,334 were imprisoned in the camp at Omarska, 700 to 800 were exterminated, 37 female detainees were repeatedly raped and tortured, upwards of 150 men singled out daily for execution. One thousand men, women, and children from the Prijedor region are still missing.

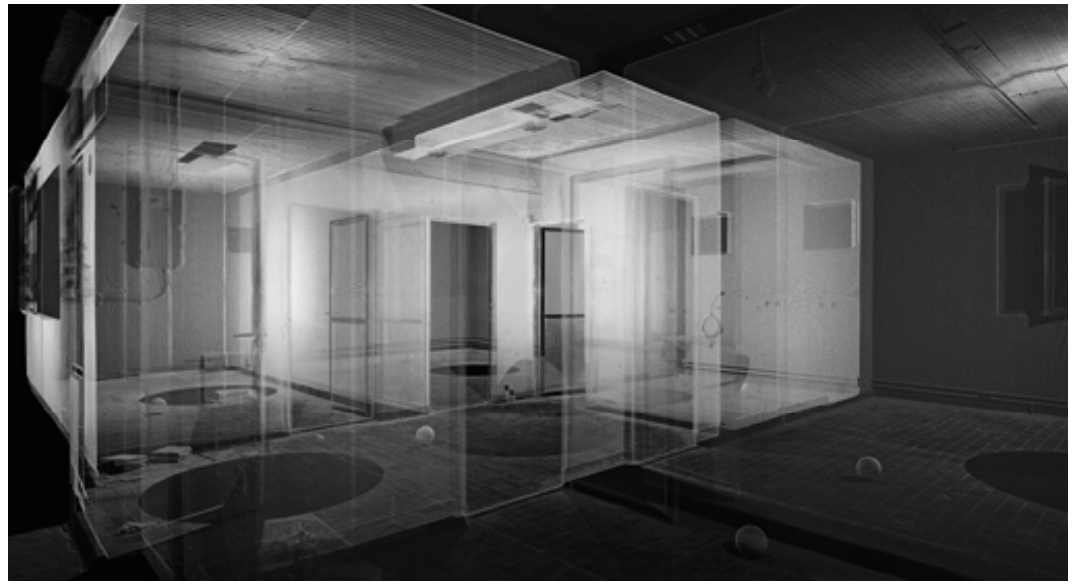


Narrator 2: The facts and figures of the ArcelorMittal Orbit, the showpiece of London's 2012 Olympics, are tragically intertwined with the history of war crimes that took place on the very grounds from which ArcelorMittal subsequently began to extract not only its soaring global profits, but the very iron ore that the director of ArcelorMittal Prijedor boasts has been used in the construction of the Orbit.



Narrator 2: In the absence of a promised memorial, London's Olympic landmark, the ArcelorMittal Orbit, was reclaimed as the Omarska Memorial in Exile on July 2, 2012. Anirban Gupta Nigam: An act of reclaiming made possible because of the material power of steel to forge a connection between two disparate localities, events, and times. Between two geographies where corporate power, aesthetic practice, and large-scale mining are colliding in interesting and dangerous ways: the camp in Omarska, and the Olympic Tower in London.









Figs. 37–41. (above and overleaf) White House, Omarska. Selected images from the 3D laser scan survey, 2012.
Images: Forensic Architecture/ScanLAB.





Fig. 42. Caroline Sturdy Colls presenting an analysis of GPR data collected in Staro Sajmište.
Photo: Forensic Architecture/Caroline Sturdy Colls.


ТРИБИНА ОКТОБАРСКОГ САЛОНА ИЗАЗВАЛА РЕАКЦИЈЕ И ОТВОРИЛА ПИТАЊЕ ПОЛИТИЗАЦИЈЕ УМЕТНОСТИ

Нови експеримент у логору смрти

Жучна расправа о логорима

Figs. 43, 44. Newsprint coverage of the public forum, Living Death Camps, October 2013, Belgrade. Headlines read: "New Experiment in the Death Camp: The October Salon Panel Discussion Provoked Reactions and Opened the Question of Politicized Art"; "The Raging Debate on the Camps."

Postscript

During the public forum we convened on October 5, 2013 at the German Pavilion in Staro Sajmište, we presented our archaeological report and mobilized its findings in support of our claim that the site be considered a living death camp, and of the right of residents to remain there. As part of this event we screened our video documenting the Memorial in Exile project. Presenting material about Omarska in the site of a former World War II concentration camp in Belgrade proved controversial. The event was continuously disrupted by a group of people who had traveled from Republika Srpska expressly for the occasion, including groups from the Prijedor municipality. Other members of the audience were critical of what they perceived to be an equivalence drawn between the histories of the two camps.[14]

Our objective, rather, was to unpack the complex set of historical and political relations between the camps. The violent controversy ignited by our project demonstrated how politically charged these relations still are. Looking at the two camps together through the conceptual frame of living death camps was a call to renegotiate the complex interplay between history, commemoration, and ongoing uses on both sites.

Demonstrating the unique conditions of each of the camps, the project resulted in a distinctly different claim for each: in Staro Sajmište we opposed the existing plan to commemorate World War II atrocities at the cost of displacing the present inhabitants, the very inhabitants whose life there protected this place from demolition; whereas in Omarska we called for public access to be granted to the site of an operative mine, and thus for a public recognition of the place's history.

1 See Caroline Sturdy Colls and Forensic Architecture, *An Archaeological Assessment of the Area of the Former Judenlager and Anhaltlager at Staro Sajmište, Belgrade, Serbia* (2013), http://www.forensic-architecture.org/investigations/living-death-camps/.

2 See Amor Mašović, president of the Bosnian government's Commission for Tracing Missing Persons, quoted in Ed Vulliamy, "New Battle Breaks Out over Serb Death Camp," *Guardian*, December 2, 2004.

3 Ed Vulliamy, "Shame of Camp Omarska," *Guardian*, August 7, 1992. See also Michael R. Gordon, "Conflict in the Balkans: NATO; Modest Air Operation in Bosnia Crosses a Major Political Frontier," *New York Times*, April 11, 1994.

4 Sharon Sliwinski, "The Aesthetics of Human Rights," *Culture, Theory & Critique,* vol. 50, no. 1 (2009): 23–39.

5 See Caroline Sturdy Colls and Kevin Colls, "Reconstructing a Painful Past: A Non-invasive Approach to Reconstructing Lager Norderney in Alderney, the Channel Islands," in *Visual Heritage in the Digital Age*, eds. Eugene Ch'ng, Vince E. Gaffney, and Henry Chapman (New York: Springer, 2013): 119–46; and Caroline Sturdy Colls, "The Archaeology of the Holocaust," *British Archaeology*, vol. 130 (2013): 50–53.

6 See http://www.scanlabprojects.co.uk.

7 Giorgio Agamben, *Profanations* (New York: Zone Books, 2007), 84. See also Alessandro Petti, Sandi Hilal, Eyal Weizman, *Architecture after Revolution* (Berlin: Sternberg Press, 2013), 18–19.

8 In addition to members of Forensic Architecture and Grupa Spomenik, participants included members of the Working Group Four Faces of Omarska, as well as Satko Mujagić, Rezak Hukanović, Kemal Pervanić, Sudbin Musić, Fikret Alić, and Mirsad Duratović—all survivors from the Omarska and Prijedor camps.

9 ArcelorMittal press release, May 15, 2012, http://corporate.arcelormittal.com/news-and-media/news/2012/may/15-05-2012.

10 It was included in the following audio-visual documentaries: "BBC Witness," BBC World Service Radio, 6 August 2012; "Omarska Memorial in Exile," BBC World Service TV, dir. Rachel Wright, August 10, 2012; "Conspiracy of Silence? The Forgotten Genocide of Omarksa, Prijedor," Islam Channel, August 17, 2013.

11 In the course of the elaboration of the project, a request for access to the mine was denied to us by ArcelorMittal Prijedor on March 23, 2012. This denial of access to University of London researchers—which we disseminated widely in media and online forums—arguably brought about, as a public response, a rather significant gesture by ArcelorMittal Prijedor: on July 2, 2012, it announced eight more visitation days to the Omarska site in addition to the annual commemoration day on August 6. "During these visits, normal working operations around the White House area and access roads are suspended so that people can safely visit to pay their respects to the victims of the 1992 conflict." "ArcelorMittal Releases Statement to Address the Campaign to Name the ArcelorMittal Orbit a 'Memorial in Exile,'" http://corporate.arcelormittal.com/news-and-media/news/2012/jul/02-07-2012.

12 "Time and again other prisoners claim that they observed dead bodies taken out from interrogation and left on the ground outside for others to see. Fellow prisoners also noted that a number of prisoners taken for interrogation never returned to their detention room and were later not seen elsewhere either." Annex V, *Prijedor Report* 65, in Annexes to the Final Report of the Commission of Experts Established Pursuant to Security Council Resolution 780 (1992), Vol. I, U.N. Doc. S/I 994/674/Add.2(Vol.1)/Annex V (1994).

13 Levi continues: "The great film critic and theorist Serge Daney, a onetime editor of *Cahiers du cinéma*, has persuasively argued that the advancement of film culture depends, among other things, precisely on our understanding of the fact that some films ought not to be seen." Pavle Levi, "Kapo from Omarska," *BETON* (a cultural and propaganda brochure), no. 68, April 7, 2009.

14 In contrast with these antagonistic reactions, the Living Death Camps project received a special mention by the Jury of the 54th October Salon, Belgrade, October 9–November 7, 2013.

Forensic Architecture
Eyal Weizman (Principal Investigator), Susan Schuppli (research & coordination – Omarska), Francesco Sebregondi (research & coordination – Staro Sajmište), Srdjan Jovanovic Weiss

In partnership with
Grupa Spomenik (Damir Arsenijević, cultural theorist; Jelena Petrović, theorist of culture and literature; Branimir Stojanović, philosopher and psychoanalyst; Milica Tomić, artist), Working Group Four Faces of Omarska (Mirjana Dragosavljević, art historian and curator; Srdan Hercigonja, political scientist; Vladimir Miladinović, artist; Nenad Porobić, electrical engineer; Marija Ratković, architect; Milica Tomić, artist; Dejan Vasić, art historian and curator; Jovanka Vojinović, art historian; Zoran Vučkovac, theorist of culture), Centre of Archaeology at Staffordshire University (Caroline Sturdy Colls, Research Lead; Kevin Colls, Archaeological Project Manager), ScanLAB Projects (Matthew Shaw and William Trossell, Partners)

Collaborating Organizations & Individuals
Robert Jan van Pelt (historical research), Jovan Byford (historical research), Association of Detainees "Prijedor 92" (Sudbin Musić, Mirsad Duratović), "Guardians of Omarska" (Satko Mujagić), Kemal Pervanić, Rezak Hukanović, Fikret Alic, "Through Heart to Peace" (Emsuda Mujagić), Red Min(e)d (Danijela Dugandžić Živanović, Katja Kobolt, Dunja Kukovec, Jelena Petrović), Institute for Duration, Location and Variables (DeLVe)(Ivana Bago, curator and writer; Antonia Majača, curator and writer), Rachel Wright (BBC World Service)

Proportionality Complex: NATO's Bombing of Radio Television Serbia in 1999

Srdjan Jovanovic Weiss

> They could have moved those people out of the building. They knew it was a target and they didn't. […] There's no point—I mean there's no way of waging war in a pretty way. It's ugly. It's an ugly business.
> — Tony Blair[1]

The intention of this text is to explore the way architecture is increasingly taking on the role of providing material evidence in cases of killing from the air. The so-called collateral damage that resulted from NATO's bombing of the headquarters of Radio Television Serbia (RTS) during the night of April 23, 1999, in Belgrade provides the main case study. The building complex of RTS is an accumulation of separate structures erected over an extended period of time to create an urban block. The NATO strike targeted a relatively small part of the larger complex, resulting in the killing of 16 out of a presumed 120 employees who were present working the night shift at the time of the bombing.

In 1999, the Federal Republic of Yugoslavia instituted proceedings against ten NATO states before the International Court of Justice (ICJ) in the Hague over NATO's campaign against Yugoslavia.[2] The main point that the ICJ was called upon to address concerned "the legality of use of force" by the NATO States. The ICJ deemed that it lacked the jurisdiction to decide and refused provisional measures in all ten cases brought to it by Yugoslavia. Allegations that NATO had used force unlawfully and that it had violated the laws of war persisted during and after the NATO bombing campaign.[3] In the wake of such allegations and following numerous requests to initiate an investigation against senior military and political figures said to be responsible for the alleged violations, the prosecutor of the International Criminal Tribunal for the former Yugoslavia (ICTY) established a committee to review the NATO bombing campaign against Yugoslavia. The report produced by the committee included an examination of the bombing of Radio Television Serbia and found it to be within the bounds of legality.

The issue revolved around the relation between the architectural characteristics of the building and the number of civilian casualties deemed acceptable. The report submitted to the ICTY prosecutor formulated the course of the debate over collateral damage thus:

> Para. 75. NATO intentionally bombed the Radio and TV station and the persons killed or injured were civilians. The questions are: was the station a legitimate military objective and; if it was, were the civilian casualties disproportionate to the military advantage gained by the attack?

After lengthy analysis of precedent cases, the report concluded the following:

> Para. 77. Assuming the station was a legitimate objective, the civilian casualties were unfortunately high but do not appear to be clearly disproportionate.[4]

The legitimizing of the target lies in the intervening paragraph 76, which confirms that the RTS building was seen as part of the war machine of NATO's enemy, thus making the bombing of the complex to halt its operations a legal action that would give NATO an advantage over its enemy. The finger was thus pointed back at Slobodan Milošević and his state media for not warning the staff in the RTS building of the imminent bombing of the structure.

Significantly, the report to the ICTY prosecutor does not contain any analysis of the architectural organization of the urban block of the RTS headquarters in Belgrade's urban downtown area. The fact that the complex comprises several buildings could have had a significant bearing on the proportionality principle, whose economy dictates that the collateral damage that includes the number of people killed must be balanced against the military advantage anticipated. The question that was not addressed by the court was what might comprise a "building." The 120 people that were reportedly in the "building" were in fact in many other parts of the complex: this was certainly not the total number in the particular building targeted by the strike. However, by conjuring a single, larger building out of this complex, NATO was able to cite the larger number, thus making the percentage of lives lost appear much lower.

Another question in regard to the laws of war in the case of the RTS building appears concerns whether state media should be counted as part of the war machine, and therefore as a legitimate target at all. This debate marks a distinction between the waging of traditional war and "modern war," with the latter, as General Wesley Clark (chief commander of NATO) wrote in the aftermath of the NATO bombing of Yugoslavia, constituting a war on infrastructure and networks.[5]

Following the failure to persuade the ICTY prosecutor to launch an in-depth investigation, let alone file charges against anyone from NATO, proceedings were initiated before the Serbian Court, this time focusing specifically on the bombing of RTS: the case was directed against the former director of RTS, Dragoljub Milanović, for his negligence in failing to inform and evacuate the workers before the strike. Judged to have known that the building was to be targeted during the NATO bombing campaign, he was convicted in the spring of 2002 for criminal negligence and sentenced to ten years in jail for not respecting the order of the federal government to evacuate people and equipment from the RTS complex.[6] This was the only person found legally accountable for the deaths resulting from the NATO bombing of RTS.

In the legacy of Sergei Eisenstein, the urban structure of the RTS building complex has the form of a montage. It is a composite of disparate architectures, combining mid-century, modern, and postmodern styles. The first RTS building (originally Radio Television Belgrade—RTB) is a notable modern structure which sees the principles of Le Corbusian aesthetics applied within the framework of Yugoslav postwar architecture. This part of the larger RTS building complex was left untouched during the NATO strikes, which targeted an older building backing on to it. This was allegedly because the production studios were in that building, which was filled with editors and other staff twenty-four hours a day. The bombed structure was tucked between two other additions to the dense urban block. This is perhaps where NATO executed its most precise strike of the entire campaign. It also sent a deadly message that it would not spare human lives when targeting architecture of any kind that was being used by Milošević's state media.

The architectural specifics of the complex, far from being a matter simply of aesthetics, are directly pertinent to the question of legal and ethical responsibility in this case. Acknowledging that the architecture of a target, as in this case, can be used as a legitimizing basis on which to bypass accusations of excessive collateral damage suggests the need for a spatially updated interpretation of the definition of military objectives and of the proportionality principle.[7] An investigation of this need would entail examining the elasticity of the proportionality principle for military interventions in general, not just NATO's campaign against Yugoslavia. When a military alliance with the might possessed by NATO is able to remove architecture from within cities, we may have cause to think not only of the destruction caused by war in general, but of the "corrective urbanism" that is enabled by the technological precision with which the military is able to remove selective architectural targets and thus intervene in the urban environment. Why is this troubling? In contrast to the horror of the carpet bombings of World War II that devastated whole European cities, perhaps there is a new, more subtle kind of terror in the idea of a precision bombing which can chip away from the city particular undesirable architectural and infrastructural elements "representing" rogue political systems, while leaving the rest intact. As such, precision turns targetiers into architectural critiques of sorts.[8]

It is curious that throughout the campaign "buildings" were described using anatomical metaphors, sometimes as the "heart" and sometimes the "brain" of the "body" of the enemy. The BBC reported that "NATO has defended its bombing of Serbia's state television station saying it was a legitimate target and a 'ministry of lies'" and cited a NATO spokesman who

declared that the strike "must be seen as an intensification of our attacks at the very brains of Milošević's military apparatus and leadership."[9] It remains unclear whether the metaphors of the body were used to legitimize the bombing as a "humanitarian mission," as if it was literally a "surgical intervention."

Other former Yugoslav institutions that were bombed could not undertake legal battles on the basis of humanitarian law in the way that was possible for RTS due to the human casualties involved. For example, the bombing of the Yugoslav Army Headquarters and the Central Committee of the Yugoslav Communist Party tower in Belgrade—both exemplary of the aesthetic achievements of modern architecture—did not involve casualties within the buildings and, since the structures themselves were deemed to fall within the category of military objectives, could not be considered for international legal proceedings. The loss of these two particular buildings in bomb attacks symbolically represented the overall, final loss of the late socialist political system: thus they became architectural and political ruins, to be remodeled as commercial centers, as in the case of the central committee tower, and as may also become the case of the army headquarters complex.[10]

In the case of RTS, Human Rights Watch later reported that regarding "the bombing of Serb Radio and Television headquarters in Belgrade […] Human Rights Watch questions the legitimacy of the target."[11] The Amnesty International report goes further in mining the data, suggesting that the targeting of RTS was illegal. This is both because the structure was said to be a civilian object and because the attack was in any event deemed a violation of the principle of proportionality and of the duty to take precautions, including by way of effective warning to the civilians likely to be harmed by it. This report cites Western journalists who were warned hours before the attack to stay away from the building: indeed, a first planned attack was apparently called off several days earlier due to Western journalists reportedly having received warnings at the time to evacuate without delay, while others allegedly did not receive the warning. The political aspect of this delay may have been echoed in the statement about the bombing of RTS made by General Wesley Clark: "We knew when we struck that there would be



Fig. 1. Serbian Radio and Television Headquarters building, Belgrade, 1999. This photograph was taken shortly after the attack on April 23, 1999, at 1:40 a.m. It shows the bombed part of the RTS complex during the site cleaning. Photo: TANJUG state news agency, Belgrade.



Fig. 2. Serbian Radio and Television Headquarters building, Belgrade, 1999. Rescue operations after the bombing, April 23, 1999. Photo: Reuters.

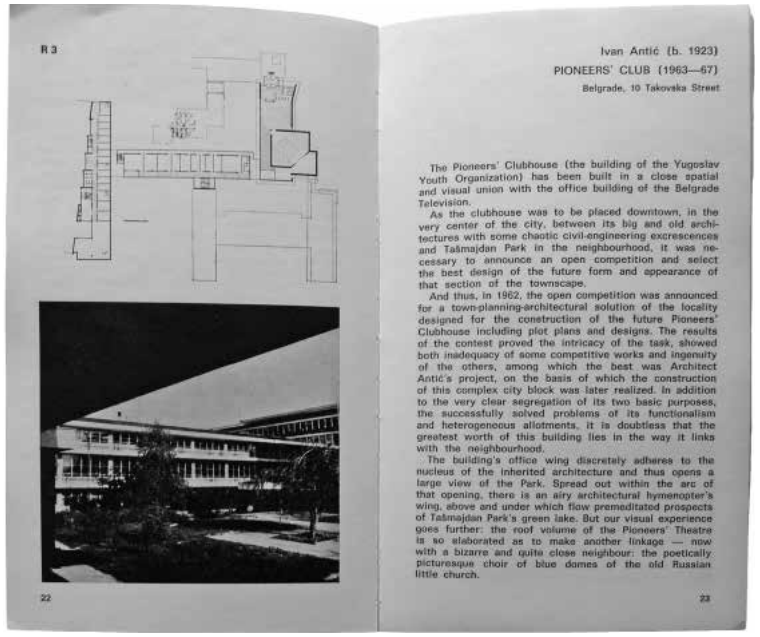
alternate means of getting the Serb Television. There's no single switch to turn off everything but we thought it was a good move to strike it and the political leadership agreed with us."[12] In other words, NATO attacked a civilian object, killing civilians, for the purpose of disrupting Serbian television broadcasts in the middle of the night for approximately three hours. It is hard to see how this can be consistent with the rule of proportionality. The infamous statement by Tony Blair blaming Yugoslav officials for not evacuating the civilians from the RTS building deflects attention not only from the issue of specifying an urban target—implying that such a target is lawful and legitimate—but also from the specificity of the scale of the military and political responsibility of the perpetrator in destroying a civilian object of cultural significance. Notwithstanding the findings published in reports by Human Rights Watch and Amnesty International, there were deemed to be insufficient grounds for initiating an in-depth investigation by the ICTY prosecutor.

During the bombing NATO continually presented the procedure by which it chose its targets. In the international press, General Wesley Clark divided the targets into "strategic" and "tactical." Besides air defense, military forces, supply roads, and command and control objects, strategic targets included "sustaining infrastructure and resources."[13] This comprised not only urban targets, infrastructure, bridges, electrical plants, and oil refineries, but also administrative buildings. What can be the strategic value of a large, highly visible media building in the center of the city, especially after it has been emptied of its personnel and equipment? Physically, the strategic value of bombing RTS proved to be zero—as though it were little more than a military exercise: the ratification of this exercise through the legal framework effectively assigned the sixteen lost lives the same value. A possible way to make the RTS building strategic was to "legalize" RTS as part of the war machine. On this basis NATO would be able to bomb state buildings with civilians inside.

The calculation that structures the principle of proportionality, and its elastic interpretation from case to case, signals the growing economization of contemporary warfare. As air strikes become increasingly precise they can be

more frequently applied, and may thus bring about more deaths. Furthermore, the ability to increase the precision of strikes makes them apt for intervening in architectural and urban situations. The result would not necessarily be to minimize their destructive effect; on the contrary, precision can generate effects that reach far beyond the material scope of the local strike. This is because of the complex and networked nature of cities, in which a node in a network can be hit and paralyze entire neighborhoods. The networked aspect of the target—of the city itself—may change the nature of proportionality calculations (should proportionality be locally confined, or take into account the entire spectrum of infrastructural interruption?), and may also change the perception of what can be considered a legitimate target.

Architectural analysis can no longer be restricted to seeing in the shape of ruins the kind of munitions that might have hit a building, or protesting the heritage value of buildings destroyed. The case of RTS poses a much more fundamental challenge to forensic architecture: to understand buildings as part of complex urban assemblages, connected via transmission or other channels of infrastructure. This case—and the study of the ruins of war in general—open a new dimension for architectural research: it demands that we understand a building as always a part of and an entry point to the complexities of the urban. Beyond that, the proportionality complex teaches us another fundamental lesson relevant for today's urbanism: that there are always alternative economies of calculations, and that these depend on who it is that makes the calculation, and on behalf of whom.


R 3

Ivan Antić (b. 1923)

PIONEERS' CLUB (1963—67)

Belgrade, 10 Takovska Street

The Pioneers' Clubhouse (the building of the Yugoslav Youth Organization) has been built in a close spatial and visual union with the office building of the Belgrade Television.

As the clubhouse was to be placed downtown, in the very center of the city, between its big and old architectures with some chaotic civil-engineering excrescences and Tašmajdan Park in the neighbourhood, it was necessary to announce an open competition and select the best design of the future form and appearance of that section of the townscape.

And thus, in 1962, the open competition was announced for a town-planning-architectural solution of the locality designed for the construction of the future Pioneers' Clubhouse including plot plans and designs. The results of the contest proved the intricacy of the task, showed both inadequacy of some competitive works and ingenuity of the others, among which the best was Architect Antić's project, on the basis of which the construction of this complex city block was later realized. In addition to the very clear segregation of its two basic purposes, the successfully solved problems of its functionalism and heterogeneous allotments, it is doubtless that the greatest worth of this building lies in the way it links with the neighbourhood.

The building's office wing discretely adheres to the nucleus of the inherited architecture and thus opens a large view of the Park. Spread out within the arc of that opening, there is an airy architectural hymenopter's wing, above and under which flow premeditated prospects of Tašmajdan Park's green lake. But our visual experience goes further: the roof volume of the Pioneers' Theatre is so elaborated as to make another linkage — now with a bizarre and quite close neighbour: the poetically picturesque choir of blue domes of the old Russian little church.

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Fig. 3. Pages from Mihajlo Mitrović et al., *Modern Belgrade Architecture* (Belgrade: Jugoslavija, 1975), showing the original plan of the building of Belgrade Television built between 1963–67 next to the Pioneer's Club (Yugoslav Youth Organization).

1 "Moral Combat: NATO at War," BBC, March 12, 2000, transcript available at http://news.bbc.co.uk/hi/english/static/events/panorama/transcripts/transcript_12_03_00.txt.

2 The NATO bombing campaign in former Yugoslavia is generally described as having lasted for seventy-eight days. It is commonly described duplicitously: firstly, that the campaign is portrayed as a humanitarian intervention with the intention of preventing a Holocaust-like catastrophe being perpetrated in Kosovo by the reported terror regime of Milošević's police and paramilitaries; secondly, in that the campaign was presented as an attempt to remove Milošević from his thirteen-year hold on power and prevent him from further corrupting the already eroded political system of Yugoslavia. It was to be the final defeat of Slobodan Milošević in the eyes of the international community, putting a stop to his project of carving out Serbian national territory from the disintegrating Yugoslavia. This project had already been thwarted in Croatia and Bosnia, while other former Yugoslav states had parted ways diplomatically. After a series of diplomatic battles, both with Milošević in Yugoslavia and then between themselves, the US and the EU, without the approval of the UN, gave NATO the mandate to create a theater of war over Yugoslavia's skies. The military operations commenced shortly afterwards.

3 See for instance the Amnesty International, *NATO/Federal Republic of Yugoslavia—"Collateral Damage" or Unlawful Killings?* (June 2000), http://www.amnesty.org/en/library/asset/EUR70/018/2000/en/e7037dbb-df56-11dd-89a6-e712e728ac9e/eur700182000en.pdf.

4 UN International Criminal Tribunal for the Former Yugoslavia, *Final Report to the Prosecutor by the Committee Established to Review the NATO Bombing Campaign Against the Federal Republic of Yugoslavia* (June 13, 2000), 2000, articles 71–79, http://www.icty.org/sid/10052#IVB4.

5 General Wesley K. Clark, *Waging Modern War: Bosnia, Kosovo and the Future of Combat* (New York: Public Affairs, 2001).

6 Milanović's sentence expired on September 1, 2012. See Ivana Miljković, "Sećanjenažrtve bombardovanja RTS-a," Radio Television Serbia, April 23, 2013, http://www.rts.rs/page/stories/sr/story/125/Društvo/1310524/Sećanjenažrtve bombardovanja RTS-a.html.

7 Military objectives are defined in Article 52(2) of Additional Protocol Relating to the Protection of Victims of International Armed Conflicts, June 8, 1977, 1125 U.N.T.S. 3 (Additional Protocol I), which is considered reflective of customary international law. The principle of proportionality, which is also part of customary international law, is articulated in Article 51(5)(b) thereto. See also Eyal Weizman's description of the principle of proportionality as a basis for the lesser evil in *The Least of all Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2013), 10–12.

8 See Srdjan Jovanovic Weiss, "NATO as Architectural Critic," *Cabinet*, issue no. 1, "Invented Languages" (Winter 2000/2001).

9 "Nato defends TV bombing," BBC News, April 23, 1999, http://news.bbc.co.uk/2/hi/europe/326653.stm. Even earlier, in 1997, *New York Times* reported on Radio Television Serbia as being Milošević's own show. See Jane Perlez, "Serbian Media is a One-Man Show," *New York Times*, August 10, 1997.

10 See my analysis of the army headquarters building in "NATO as Architectural Critic." The current government of Serbia aims to strip the army headquarters of its preservation status in order to sell the lot to the Sheikh of Abu Dhabi, Mohammed bin Zayed Al Nahyan. See "Srbija Naša Kupca? Trampišeik u trciza Generalštab, hoće da grade hotel?" Telegraf, November 21, 2013, http://www.telegraf.rs/vesti/883224-tramp-i-seik-u-trci-za-generalstab.

11 "Regardless of NATO's legal determination that civilian radio and television were legitimate military objectives because of their role in internal and external propaganda, NATO did not take adequate precautions in warning civilians in the attack on the media headquarters, nor did the attack satisfy the legal requirement in terms of proportionality, given that the center was located in a densely populated urban neighborhood and was staffed twenty-four hours." Human Rights Watch, *Civilian Deaths in the NATO Air Campaign* (February 2000), http://www.hrw.org/reports/2000/nato/Natbm200-01.htm.

12 See Amnesty International, *"Collateral Damage" or Unlawful Killings?*, 40–46.

13 General Wesley K. Clark, SACEUR, "Effectiveness and Determination," June 2, 1999, http://www.nato.int/kosovo/articles/a990602a.htm.

CHECHNYA ALBUM
OCTOBER 1999–JANUARY 2001

Jonathan Littell

At first it looks just like a tourist's album, the kind of book full of souvenir photos that people used to put together after a holiday, before the world went digital, to show friends and family. The photos are glossy, badly glued, deforming the pages a bit; the captions are meticulously scrawled, the dates precise. There's the usual mix of images: landscapes, skies, buildings; pictures of friends, of slightly remarkable events, of happy moments, of the tourist himself posing in front of a landmark. Nothing special.

It's true though that the buildings are a mess, and the natives seem armed to the teeth. For these are photos of war, of the Second Chechen War, as it's known. And most of the photographs document the appalling destruction wrought upon Groznyi and other villages by the intense Russian bombardments that began in September 1999 and continued, without cease, through March and April 2000. Yet in contrast with the horrors depicted in some photographs, the sheer banality of the others, of the album itself, is grating. It is true that even in a war there are quiet moments, moments of pleasure with friends, of soft irony, of beauty even, and these, on occasion, also get photographed. And then again, the album was never meant to be public.

During the First War, in 1996, I lived for six months in Groznyi (I was working for the French aid agency Action contre la Faim), and I didn't take a single picture. I didn't believe in cameras then, only in memory, and other than a handful of photos made by some friends, or those published by journalists, I have no images of that war. The second time around, when I returned in 1999, something had changed; but what? I am not sure. I didn't yet have children, that immense generator of photographs; probably my bosses back in Paris asked me for pictures, so they could visualize what was going on. I was working for the same aid agency as the first time around, we were trying to get in-country to distribute aid, and because of the risks, hardly any foreigners actually entered Chechnya; my superiors knew they never would (although my desk officer, shown in a couple of pictures, finally did come for a visit, in June 2000).

The photos documenting the destruction—the reason the album has been included here—were taken fairly systematically, neighborhood by neighborhood, roll after roll (small APS capsules actually, the last new film format before digital), and developed and stored in boxes specially conceived for the panoramic format. However, except for the photos related to the Aldi massacre, taken at the request of Human Rights Watch, their objective was not human rights, nor politics. One important stake, at the time, was guessing the number of people who had returned to live in the ruins. The authorities, by mid-2000, claimed that some one hundred thousand people lived in the city, which had a direct incidence on the amount of food and other aid the UN and the NGOs would provide. Our visual estimations of the level of destruction made these claims ridiculous: the buildings left standing, at that time, couldn't have housed more than twenty thousand people, in the whole city. And the photographs showed this to the UN and European officials who signed off on the programs without ever visiting Chechnya.

Next to that, there was the natural impulse to document our programs—the distributions, the beneficiaries, the obstacles (checkpoints), the field trips. Then there were the photos taken as souvenirs, of friends and colleagues. Most of these have been blanked out here: except for my colleague Shamil Dachaev, murdered in 2001 as I recall, the others are still living in Chechnya, and being shown here could conceivably put them at risk. The city and the villages, since 2000, may have been rebuilt, but the violence remains, just below the surface.

The album came much later. It was a convenient way to select and organize the best photos, to caption them, probably with my children in mind, just in case I wasn't around when they grew up to show them these images myself. I enjoyed making it. And then, with its neatly organized mix of scenes, people and scenery, it landed on a shelf, where it's been gathering dust ever since. Just like any tourist's album.

JL

The following pages show selected extracts from the full album and an interview with the author by Andrea Bagnato conducted on May 14 and 16, 2013, both of which are reproduced in their entirety at www.forensic-architecture.org.



During the Second Chechen War (which began in 1999 and tapered out around 2005), because of the kidnappings, all the NGOs were based in Nazran, which was the capital of the neighboring Republic of Ingushetia. We had police escorts when in Ingushetia and we traveled in and out of Chechnya; we never really slept over. My organization, Action Against Hunger (Action Contre la Faim, ACF), was one of the only two—the other being Médecins Sans Frontières (MSF)—that didn't take escorts into Chechnya, for reasons of objectivity and neutrality.

The checkpoint in the image at the top is at the crossroads between the main highway, which is called the Rostov-Baku Tras, and the intersections to Sernovodsk and Assinovskaya. [These were the two places where we started working: the first two villages right over the border, administratively inside Chechnya.] And this was a checkpoint of Cossacks, as they indicate: "DONtsy" means Don Cossacks, and they have this lovely graffiti, "Terrorism is a disease, but we, DONtsy, are going to cure it." The bottom photo shows a checkpoint—they had a checkpoint about every kilometer on the Tras. From the border to Groznyi you had to go, if I remember correctly, through thirty-one checkpoints, all similar to the type you see in the picture here. And so this bottom one is pretty representative. The checkpoint is actually a fortified camp, because they got attacked at night, so they've got concrete blocks around it, and tanks. And in each checkpoint they were racketing all the people going through. We didn't pay because we had official papers, we were an NGO, but all the civilians going through the checkpoints had to pay ten rubles a head per checkpoint, which means three hundred rubles to get from the border to Groznyi. The money was being passed up through the chain of command, up to the Ministry of Interior general who was in charge of all the checkpoints in Chechnya. He was making, according to what we were told at the time, a million dollars a month from this. Obviously everybody along the chain of command was keeping a cut, but the general at the top got a million dollars a month, which is pretty typical of the way the war was run in Chechnya.





21.04.00 : Katyr-Yurt
(destroyed during the retreat
from Groznyi in early February).



There was a major episode at the beginning of February 2000 where three thousand fighters retreated from Groznyi through the town of Alkhan-Kala, immediately to its west: they were trapped there, they went through minefields, many died or were wounded in the minefields, the Russians were waiting for them and bombed them, and then they had to go further west towards the big forest called the Samashki Forest, and they hid a bit in the forest and then cut through Shaami-Yurt, Katyr-Yurt, and Gekhi-Chu, to escape up into the mountains. And as they were moving in groups of twenty, fifty, or one hundred men, the Russians were just pounding all the villages along the way with heavy field artillery and aviation; mostly field artillery.

One of the main clues to this kind of destruction is the roofs. You see the roofs have been blown off, the metal sheeting of the roof, but the wooden structure is still intact. That is typical of destruction by artillery and aerial bombardment, where it's mostly the blast effect that blows the sheeting off the roofs. In the other photos you're going to see buildings that have no wooden structure left on top. Those buildings were burned by the soldiers when they entered the village. When they occupied the villages, the federal troops burned a lot of houses, either with gasoline or by using gas bottles, blowing them up from the inside. And so the way you can tell between bombardment and wanton destruction by soldiers burning houses is from the presence or not of these wooden roof structures. The building on the right was quite clearly burned: you see the flames rising above the door from the inside of the building. It was probably torched by the soldiers when they occupied the village a bit later on.

A direct hit would destroy the wooden structure, obviously, but then the walls would have collapsed too; the whole building would collapse. Like in the top photo: you see the building on the right where a whole side is collapsed. That building took a direct hit. But in the case of the ones where the wooden structure remains but the sheeting has gone, these buildings took a hit nearby and the blast blew off the sheeting. And in the bottom photo you see a building that must have been hit directly through the roof by a shell. But the roof is still there, even though it's crumpled and damaged, which is different from the photo on the right where there's no roof at all. The federal troops would occupy the villages they accused of supporting the fighters, and would torch intact houses as a vengeance. The debris you see in the photo on the right was debris that was pulled out of the houses; people had already come back and cleaned the houses.

The heavy fighting continued all the way into March. Six hundred fighters of Gelayev, a senior commander at the time, now dead, were trapped in Alkhazurovo and Komsomolskoe, and were basically annihilated. All the survivors were captured and mostly murdered after their capture; this is all very well documented. The fighting ended at the end of







21.04.00 : Katyr-Yurt.
Left, the town morgue.
Lower right, a resident showing
rocket and shell fragments
that destroyed his house.

March. So we must have gone in three or four weeks after the major combat operations had ended. By that point, by the time we were allowed in, the fighters had moved up into the mountains and the fighting was more localized. And clearly we were entering with permission of the Federals, so we could only go where they allowed us to go, when they allowed us to go. We weren't doing this clandestinely. But still it was relatively soon after the Katyr-Yurt destruction—the people had just come back a few weeks before us.

The mosque has taken a direct hit from a shell. The Russians were also using a lot of Grad: multiple-rocket launchers on trucks, sometimes called Katyusha, that fire a series of rockets. And at the bottom you see bits of different types of ordnance that the man was showing us: some of it is rockets, some of it is shells. Grads are a highly imprecise weapon: you fire ten or twenty rockets at the same time, it's a scatter-effect weapon, and firing that on a populated village full of civilians is considered a war crime by international standards. There is no way you can claim accuracy or discrimination with that type of shelling. So you see the mosque has been hit by shelling, you see the houses; on the next page this man's car has been burned. I don't remember whether the mosque was bombed or the roof collapsed during shelling.





16.05.00. Grozny.
Above left, house on ul. Mira. Below left, ul. Mira, looking towards the market. Right, ruins of my 1996 office, with its owner [redacted]. The address is [redacted].



This poor lady is standing in the debris of her house, a huge amount of debris. Artillery doesn't make holes that big, so that would probably be a half-ton bomb dropped from an airplane. If it were a one-ton bomb, the house wouldn't have been left standing. Then you have my former office, of which the roof is still standing—it's pretty damaged. It was my office during the First War. I just went back to visit it.





16.05.00. Grozny.
Above: apartment blocks on Sheropromyslovskoye Shossee.
Below: on the Shossee, intersection for the TRANSMASH factory and Turbina, where [redacted] had her office in 1995-1996 (MSF-Belgium).

I was shooting with an old type of camera—it's actually film, an APS format which allowed me to do panoramic views, so I did all these panoramics to show the buildings. In that panoramic at the top you can clearly see that an airplane flew right over the building and just dropped one bomb after another, all along the entire length of the building. It's one, at most two, strafing raids from an airplane just systematically flying along the axis of the building and dropping halfton bombs, destroying the entire height of the building. The bombs fall through their own weight a couple of floors into the building and detonate towards the bottom, thanks to a delaying device on the fuse.



16.05.00. Groznyi. Above: ruins near Minutka. Below: view to Zavodskoi raion from Aldi.



In the next photo, the panoramic at the top shows the ruins near Minutka, one of the main roundabouts of the city. At the time there was a series of buildings around Minutka which were known as the *devyati etazhey*, the "nine-floor" buildings. They were called that because they were the only nine-floor buildings in the city. They were dynamited by the Federals in March 2000, shortly after they took Groznyi, with the official reason being that the Chechens were using them as a snipers' nest. So they destroyed, they dynamited, every single one of these nine-story buildings, which were the main, tallest, most important civilian habitations in the city. Nothing was left. And the bottom photo: we headed through the city towards the west and went to a suburb called Aldi. The photo is taken from a hill, looking back at the city and the Zavodskoy district.



30.05.00. Groznyi. Apartment blocks off ul. Zhukovskogo.



You see different types of destruction on these buildings: shelling hits, mostly shelling on these buildings. And in the bottom photo you see one apartment which is inhabited; in the middle of these devastated apartments, someone's put her laundry out to dry. And you see there is a chimney, with smoke from the chimney coming out. Everything else around has been destroyed, visibly by artillery fire.



30.05.00. Grozny i.
Above, cinema on Lenintsky Prospekht. Below, Federal CP on Minutka ploshad.



This is a cinema; it clearly took a hit from an airplane bomb, a big one, possibly one ton, given the size of damage. In the bottom photo, the whole Minutka roundabout was transformed into a giant checkpoint. So I had to sneak these pictures because it was forbidden to photograph checkpoints. The buildings, the five-story buildings in the background, are still standing, and the rubble in front of the five-story building is one of the dynamited nine-story buildings.





26.11. Itum-kale district.
Above left: along the road.
Above right: Ush-kaloi.
Below: in Itum-kale.



Then we skip to late November. For the first time we slept overnight in Chechnya. We went for four days because we were going so far in the mountains it was impossible to do a day trip. So we followed that road up to Shatoy, and up to Itum-Kale; we slept in Shatoy for two nights and then we went down another valley, the valley that goes east from Shatoy. We went up the other river, which is the Sharo-Argun, all the way into really remote territory. We went there to see if there were any villages, if people were living there, if it was worth having distributions up there. I'm always very curious, I wanted to see what it looked like, but that was the professional reason: an assessment trip.

Basically Chechnya is divided into districts, and the way the UN coordination worked, each NGO that was doing food was responsible for a set of districts. The plan was to distribute food in the entire district, not just the main towns, and so we wanted to do as thorough an assessment as possible to see how many people were living there, what the access conditions were, whether we could trucks get there, what cooperation we could expect from local authorities and what kinds of problems we could have at checkpoints. Because it is so close to the border of Russia, it's actually an area under Border Troops control, which is a completely different branch of the military. You found yourself dealing with either regular Army, or FSB (the Federal Security Service) or MVD (the Ministry of Interior), and obviously each branch didn't recognize the permissions you got from other branches. You could have an Army permission, and the Pogranichnie Voiska (Border Troops) would say, "Fuck off, we are not Army, so get out." But we actually didn't have any major problems on this trip at all, except at the border from Ingushetia when we went through a huge amount of trouble, but that's another story.



27.11. Above: view of Sharoi. Below: the cemetery in Sharoi.



And then the next day we went up to Itum-Kale. There is this village, Ush-Kaloi, which you can see was destroyed by bombing. You see the roof beams are still standing. This vehicle was destroyed by a rocket, probably fired by a helicopter.

Then we go all the way to Sharoy, which is the last village before the border. It's really the last village, and then after that there is nothing. In Sharoy, and the villages before, there was a lot of destruction: of the mosque and the bashnyas. It's is actually very old, it goes back to 1864, when the Tsarist troops, having captured Chechnya in 1859, dynamited the bashnyas, which at the time really served as fortified towers, to prevent the Chechen rebels of the time from holing up in these towers. So there is a cemetery, the old mosque and one intact house.And this place is interesting because, although it doesn't show in any of the photos, there is some 1980s prefab housing at the foot of the hill, built under Gorbachev. You know about the Chechen deportation in 1943? They were allowed to come back in 1956 but even then they were not allowed to resettle in the high mountains. They weren't allowed to resettle past Shatoy because they were felt to be still too unruly and dangerous. So the authorities wanted to keep a no-man's-land, a buffer zone up in the higher mountains. And in the 1980s, when there was glasnost and perestroika, they were finally allowed to return there—they had been resettled in the plains up to then, so very few people got there, and the living conditions are incredibly harsh and difficult. And the Soviet authorities built prefab housing for them; the village was just ruins.

Nearly nine years after these photographs were taken, Jonathan Littell returned to Chechnya, as a journalist this time. His report was published in France as a small book entitled *Chechnya, Year III* (Paris: Gallimard, 2009). The following excerpt describes Groznyi as it stood in 2009.

Tamir, a Chechen government press attaché, had offered to take us on a tour of the city. From the plane already, flying in over the city's northern Staropromyslovsky Shosse, I could guess at the extent of the reconstruction: all the buildings lining the long avenue looked new, their green metal roofs and pale yellow sidings providing bright dashes of color in the otherwise drab landscape; below us, the city sprawled out like any other provincial Russian city, and you had to look hard, and know what you were looking for, to notice the scars of old trenches and tank positions along the hilltops. In the center, everything is brand new, absolutely everything: not just the elegant nineteenth-century buildings, meticulously restored, lining the main avenue, now renamed Prospekt Putina, but the streets and the sidewalks as well, the grass borders with automatic sprinklers, the little trees, wrapped in garlands of red and blue lights, planted all along the central grassy plot, the signs, the traffic lights, and the pedestrian signals that count down the seconds left for you to cross. [...] Further on, at the end of the avenue, surrounded by lawns and fountains, looms the monumental Great Mosque of Groznyi, a copy of Istanbul's Blue Mosque entirely built in marble and hand-decorated by an army of Turkish artisans; a little lower down, the golden domes of the Orthodox cathedral gleam brightly, completely reconstructed by Ramzan Kadyrov in a spirit of perfect ecumenism even while his men continue to harass or kill the rare Russian civilians who persist in wanting to live in Chechnya. [...] As Tamir drove us around, I experienced a strange sensation, that of a phantom reality overlaying another one, the fine spanking-new city coming to recover the layout of the old, ruined, ravaged, devastated city without managing to cancel it out, as if the one were the other's dream. I had once lived in the city for months, and I know the landmarks and the neighborhoods well, but now my internal compass was completely thrown off, I could recognize the directions of the main avenues but nothing alongside them, I identified the buildings by their location rather than their appearance: I knew that here, at such a place, must be Hospital No. 9, but when it did in fact appear, I recognized nothing, nothing at all. The city, of course, has not been rebuilt as it was, the complex of nine-story buildings surrounding the Minutka roundabout, demolished by the Federals in March 2000 out of fear of snipers, still hadn't been rebuilt; but already new constructions are beginning to rise there, buildings that will grow to twenty or twenty-five stories; and further on, near the river, where once rose the ruins of Groznyi's tallest skyscraper, a sixteen-story building, Kadyrov, together with Chechen and Turkish investors, is now erecting a forty-five-story tower, the foundations of which have already been laid. In what is called the "private sector," a residential area of houses hidden by tall gates or rising behind brick walls, you can still see some scars, patched roofs and boarded windows, but even these will soon be gone: as a Chechen businessman who owns several houses in the area explained to me, Ramzan has ordered that all the damaged houses in the city are to be repaired, at their owners' expense, by year's end, or they would simply be torn down. "There mustn't be any trace of the war left," he told me, quoting Kadyrov, and indeed you have to drive kilometers from the center, out west to the great destroyed factories of the oil refinery complex, to see the kind of hulking, sinister ruins that filled the entire city eight years earlier. You could even say without exaggerating that Paris seems to have kept more traces of the Second World War, on the limestone walls of its ministries and its museums, than Groznyi has of its two wars. It is all often extremely ugly, and it's hard for me to describe the architectural style of Kadyrov's show constructions, the "Islamic airport" style perhaps, but it's functional, and many people live and work there. Alu Alkhanov, Ramzan's predecessor, did little in his three years in power beyond replastering and repainting; Kadyrov, in the same amount of time, has entirely redone this four hundred thousand-person city, complete with streets, water mains, sewers, gas, and electricity. He has built a brand-new city, from scratch. I still haven't understood where all the rubble has gone.

Translated by Charlotte Mandell

Breathing Space: The Amalgamated Toxicity of Ground Zero

Füsun Türetken

> [The world is] made up of compost of the millions and millions who have died and are blowing about. The dead are blowing in your nostrils every hour, every second you breathe in. It's a macabre way of putting it, perhaps; but anything that's at all accurate about life is always macabre. After all, you're born, you die.
> —Francis Bacon[1]

In the early hours of January 5, 2006, in his parents' house in Little Egg Harbor, New Jersey, James Zadroga passed away due to a respiratory disease, a black lung disease, and mercury on the brain.[2] At the age of thirty-four, he was a retired New York City Police Department (NYPD) officer. For the last year of his life he had been dependent on a portable oxygen tank, round-the-clock pain-relief medication (eight tablets of OxyContin a day), and about twelve other drugs. His debilitating physical symptoms were accompanied by short-term memory loss. Zadroga was one of the first responders to the destroyed World Trade Center (WTC), and subsequently spent approximately 470 hours working as part of the rescue operation at Ground Zero. Though he was the first NYPD officer to be legally recognized as having become seriously ill as a result of exposure to toxic chemicals at the site, receiving more than one million dollars in compensation, the direct causal link between his time at Ground Zero and his death was subsequently challenged, making his body, and more specifically the interpenetration of his bodily material with the airborne toxic remains of the collapsed buildings, into the subject of political and legal controversy.

Though there is perhaps nothing new in itself about legal disputes over financial and moral liability for deaths and injuries, the case forms a nexus of several of the different factors responsible for the increasing relevance, and indeed urgency, of rethinking the relations between architecture and forensics. The forensic dimension is here not concerned, as some reports were, with how and why a building collapsed—and whether, as some conspiracy theories have it, it was the work of interested state parties[3]—but rather with its actual materiality and chemical composition as it evaporated from solid to a gaseous medium whose component parts possessed a toxicity that affects the human body.[4] The three forensic reports ostensibly produced in order to establish the cause of Zadroga's death, and the debates surrounding their interpretation, focused on the presence of toxic elements within the lung tissue. At stake was the question of whether these toxic particles derived from the material of the WTC building, and whether agents representing governmental institutions—who, according to the Fifth Amendment to the US Constitution, abused their authority by willful deception regarding the toxicity of matter present in the air—could be deemed liable for injuries incurred by public workers "in the line of duty." Thus the case raises the question of whether the September 11 attacks, widely recognized as an act of terror and a human catastrophe, should not also be considered an environmental disaster. Further, it may prompt us to ask whether it is ever possible, in cases of the destruction of life, to make straightforward distinctions between environmental and other kinds of cause (for instance, acts of intentional violence or direct negligence); and indeed, to consider how we deal—politically, legally, methodologically, conceptually—with the shift from linear chains of cause and effect to the dispersed, nonlinear field of causal factors that occurs when architecture is no longer a static, background dimension of a lived environment, but a dynamic constituent of it, infused even into the breathable atmosphere.

The initial autopsy was performed by Dr. Gerard Breton, a pathologist and contractor to the medical examiner's office in Ocean County. Breton found Zadroga's lungs to be "massive in size, three times heavier than the usual weight, and firm to the touch."[5] This observation is similar to descriptions of the harm caused by asbestos: when asbestos fibers are inhaled, they become trapped in the small air sacs (alveoli) through which gas exchange takes place in the lungs. Because asbestos fibers are long, sharp, and irritating to lung tissue, the alveoli close up around them with the eventual result that the lungs become hard, fibrous, and inelastic. Over time, the continued irritations cause cancer in some individuals. When Breton continued to dissect the lungs he found "a large number of foreign-body granulomas," a response of biological tissue to any foreign material in the tissue. The scarring that had built up around the inorganic particles "was so extensive and severe that the right ventricle of Zadroga's heart had thickened from the strain of trying to force blood through the ravaged vessels and capillaries."[6] The dust-like inorganic particles Breton found in Zadrogra's lung tissue were identified by the Armed Forces Institute of Pathology as composed of talc, cellulose, calcium phosphate, and methacrylate plastic. Breton concluded that Zadroga had died from respiratory failure due to severe panlobar granulomatous pneumonitis (a fatal infection of the lung characterized by granulomas) and added in the clinical, scientific language of the autopsy report that "it is felt with a reasonable degree of medical certainty that the cause of death in this case was directly related to the September 11 incident."[7] This was the first official link made by a medical expert between the hazardous air at Ground Zero and the death of a first responder.

Breton's finding that Zadroga died from a "history of exposure to toxic fumes and dusts" seemed initially to have established with near certainty a direct causal link between the air of the attack site and his illness. It was cited as evidence in several ongoing lawsuits alleging that the toxic composite of fumes and dust at Ground Zero was deadly.[8] These claimants were residents and employees in Lower Manhattan who had been left by the Environmental Protection Agency (EPA) with a contaminated airspace and a fine dust that had settled on every surface. Dust, writes Steven Connor, is "amorphous, without form and almost void. […] This allows it to be thought of as metamorphic, with the same capacity to assume any form." It is thus the antimatter and negative form of form. Dust can get everywhere, insinuating itself into every crevice.[9] It settled everywhere around Ground Zero—as far as six blocks away from the WTC—to the depth of three inches.[10]

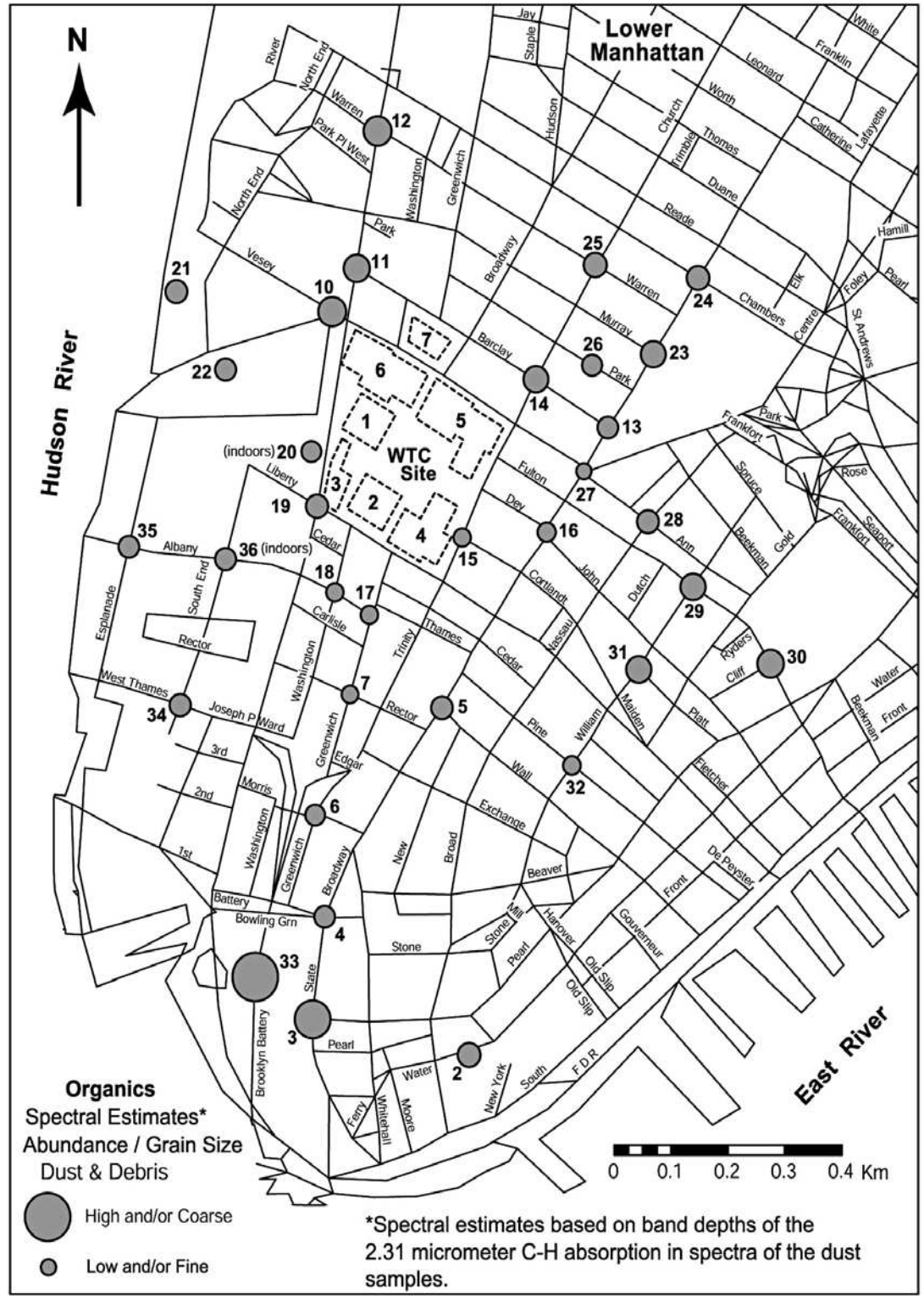
In February 2006, one month after Zadroga's death, the District Court in New York allowed key claims in a class-action lawsuit to go forward and Judge Deborah Batts ruled that the EPA and its former administrator Christine Todd Whitman had violated residents' and workers' constitutional rights by making statements that the air was safe, thus knowingly placing the victims in the way of harmful contamination.[11] In Judge Batts's view, "Whitman's deliberate and misleading statements made to the press, where she reassured the public that the air was safe to breathe around Lower Manhattan and Brooklyn, and that there would be no health risk presented to those returning to those areas, shock the conscience."[12]



Fig. 1. Artist Pat Moore in her family's apartment on Cedar Street, New York City, May 31, 2002. The apartment is covered with WTC dust. Photo: Paul Fusco/Magnum Photos.

The political impact of the Breton report was also seen in the call made by the senators of New York and New Jersey, among them Hillary Clinton, for the governor of New York City, George Pataki, to extend the list of September 11 victims to include first responders who had become chronically ill after working at Ground Zero, entitling them and their families to compensation.[13] During the bill-signing ceremony for this legislation at the WTC site on August 14, 2006, Pataki made direct reference to Zadroga.[14] However, despite these measures, the issue of paying compensation to first responders and their families was soon complicated by challenges to the original Breton report and its apparent establishment of a direct causal link. Following the new legislation, it was deemed necessary to provide further verification of the cause of Zadroga's death. Thus in the summer of 2007, copies of the first

Fig. 2. (right) Spectral estimates of organic material abundance/grain size in surface samples of the WTC dust and debris. Point 14 shows where the sample WTC01-14 was collected. Source: G.A. Swayze, R.N. Clarke, et al., "Spectroscopic and X-Ray Diffraction Analyses of Asbestos in the World Trade Center Dust," in *Urban Aerosols and Their Impact: Lessons Learned from the World Trade Center Tragedy,* J.S. Gaffney and N.A. Marley (eds.), *American Chemical Society Symposium Series* 919 (Oxford: Oxford University Press, 2006): 40–65.



autopsy and Zadroga's medical files were sent to Dr. Charles Hirsch, Chief Medical Examiner of New York City and often cited as the "father of modern forensic pathology," who retired at the beginning of 2013.

Hirsch had built the largest public DNA laboratory in the country, which allowed his office (the New York Office of the Chief Medical Examiner) to identify the remains of the victims of the September 11 attacks. He himself was injured in the attacks after he responded to the scene and was caught in the collapse of the South Tower of the WTC. He was rescued from the rubble to later lead his team through the recovery and identification of victims' remains. Directly contradicting Breton's findings, Hirsch concluded that the talc and cellulose found in Zadroga's lungs did not derive from Ground Zero: rather, "the embedded material was pharmaceutical debris produced by injecting a solution of crushed prescription pills."[15] In light of this, the open lawsuit was closed in 2007 before any financial compensation or medical assistance to the (mostly low-wage) workers was granted. The air and the maximum amount of toxic particles it should carry within a city hadn't been brought back under control by law.[16]

The president of New York's Detectives' Endowment Association doubted Hirsch's findings and suspected that the city was preparing itself for pending class-action suits from Ground Zero first respondents and workers. A few days later Joseph Zadroga, James Zadroga's father, attended a conference with Dr. Michael Baden, who had used one of James Zadroga's lung tissue slides for a segment on September 11-related illnesses on the HBO series titled "Autopsy: Post-mortem with Dr. Baden." During this appearance the pathologist announced that he had no doubt that Zadroga's death was a result of exposure to toxic dust at Ground Zero. He acknowledged the fact that granulomas can result from injecting medications but stated: "You could see glass fibers there. You don't get that from injecting drugs."[17] He had noted earlier that Breton hadn't observed any needle scars on Zadroga's arms. In October 2007 Mayor Bloomberg caused an outrage when he addressed the subject while accepting an award at Harvard's School of Public Health. He claimed that James Zadroga was not a hero. "We wanted to have a hero and there are plenty of heroes," Bloomberg said. "It's just in this case science says *this* was not a hero."[18]

However, Breton's report was criticized for failing to make a direct comparison between the particles found in Zadroga's lungs and dust gathered from the site of the attack. Thousands of air samples from Lower Manhattan were tested for asbestos by the US EPA, using different technologies to identify fibers of a certain length, and some contained asbestos at levels above the clearance standard of the 1986 Asbestos Hazard Emergency Response Act. Still, in the days following the collapse of the WTC Todd Whitman (the former EPA administrator) proclaimed the air that was carrying toxic particles "safe to breathe," perhaps so as to ensure a fast reopening of Wall Street on September 14, 2001.

Hereby both she and the White House misled hundreds of workers and residents by assuring them that it was safe to return to Ground Zero, which they followed only "to then be poisoned" by inhaling fibers and a most hazardous kind of air that would damage their lungs permanently.[19] Since then, Lower Manhattan's inhabitants have suffered respiratory problems and there have been several deaths linked to the toxic Ground Zero dust further to that of Zadroga.

In May 2002, a group of scientists at UC Davis named the DELTA Group (Detection and Evaluation of Long-range Transport of Aerosols) performed what they described as "the most thorough analysis yet" of Ground Zero dust and smoke. The study was based on the analysis of air samples from a rooftop air monitor about one mile north-northeast of Ground Zero. The scientists noted that very fine particles were found at high levels not previously found in ambient air. These very fine particles, carried in the unprecedented clouds that traversed Manhattan's airspace, are riskier to human health than larger, coarse particles. Later, in September 2003, the same group presented their new findings, which showed that the fuming WTC debris pile was a chemical factory that exhaled pollutants in dangerous forms that could penetrate deep into the lungs of workers at Ground Zero. The conditions must have been dreadful for people working at Ground Zero without appropriate protection gear or respirators, and only slightly less so for those working or living in adjacent buildings, notes the study's coauthor, Thomas Cahill, an expert on constituents and transport of airborne particles.[20]

One kind of matter in this dust and smoke cloud over Ground Zero was asbestos fiber; its material history can be traced in the forensic analysis of the dust.[21] Asbestos is the name given to a group of six different fibrous minerals that occur naturally in the environment. These asbestos minerals consist of thin, separable fibers. Asbestos fibers do not have any detectable odor or taste. They do not dissolve in water or evaporate and are resistant to heat, fire, and chemical and biological degradation. Because of these properties,

Fig. 3. (left) The use of superfine asbestos is recommended for use in a wide range of applications. Asbestos Corporation Limited (ACL) advertisement, undated.

Fig. 4. (center) Asbestos advertisement, 1970.

Fig. 5. (right) Asbestos advertisement, undated.







asbestos has been mined for use in a wide range of products, mostly in building materials and heat-resistant fabrics.

In modernity the history of asbestos is that of a mineral that started a tremendous industrialization process around the world, with a peak in 1973, the same year the WTC opened its doors. At that time the mineral fiber was a favored building material. It was highly heat-resistant, easy to incorporate, and relatively inexpensive.[22] As a result, tons of asbestos-containing products such as insulation and fireproofing were applied in the architecture of the WTC: "At least forty stories of the North Tower received the permanent fireproofing protection of the sprayed mixture of asbestos and cement."[23] In 1971, by mid-construction all new uses of asbestos in the United States were banned by the EPA. One week after the WTC collapsed, Brooklyn College environmental scientist Arthur Langer questioned the replacement of asbestos.[24] The inventor of the asbestos spray used in the North Tower, Herbert Levine, believed it would have been essential to avoid a collapse and save lives.[25] The insulation was originally designed to protect the building from collapse for four hours, which might have saved trapped occupants. Instead, "the World Trade Center Health Registry estimates about 410,000 people were exposed to a host of toxins including asbestos" in the aftermath of the collapse.[26] Airborne asbestos had been pulverized into ultrafine particles during the implosion of the WTC towers.[27] The magnitude of the asbestos level above the legal limit of a building next to Ground Zero showed that Ground Zero had essentially itself become toxic.

But how exactly does asbestos enter the body? According to physicists the dermal absorption of asbestos is minimal, but dermal contact may lead to secondary ingestion or the inhalation of dust. The primary routes of human exposure to asbestos are inhalation and ingestion. Crucially, when inhaled as toxic, microscopically fine particles, the lungs are no longer able to filter the asbestos fiber. Inhaled fibers penetrate varying levels of the body's organs, depending on their size and shape. As the lungs and other organs attempt to eliminate the presence of the fibers through a gradual exertion, the asbestos pieces either clear the respiratory areas and exit through mucus, or further scar the organ in which they remain lodged. The carcinogenic potential of these fibers mainly affects the respiratory system when inhaled over a long period. This comes as no surprise, since all commercial forms of asbestos are known to be human carcinogens. Case reports and epidemiological studies have found that





Fig. 6. (below, left) Asbestos Corporation Limited (ACL) advertisement in Asbestos magazine, an industry publication which lauded the use of asbestos in the construction of the World Trade Center, when the demand for asbestos was declining. The fire in the WTC in 1981 was thus a welcome incident for the industry to advertise the product again. ACL is a Canadian company. November 1981.

Fig. 7. (below, right) Advertisment indicates Raybestos- Manhattan as America's largest producer of asbestos textiles, woven into yarns, tape, cloth, packings, safety clothing, laminated plastics, phenolic-impregnated tapes (for rocket & missile components), brake linings, clutch facings, and automatic transmission friction parts.



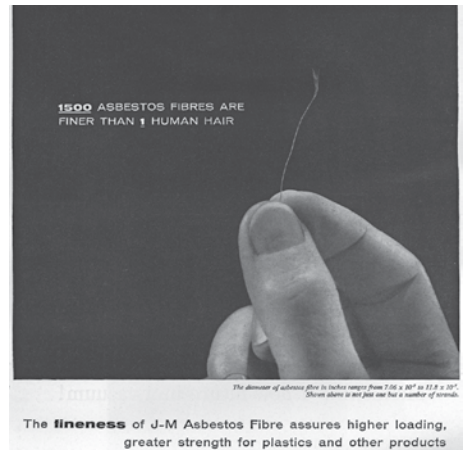


Fig. 8. (above) Johns-Manville advertisement, 1936. This demonstrates the simplified asbestos marketing during the era of significant growth of asbestos usage. The features of the advertisement show some of the basics of the asbestos concept: its raw mineral form and its fluffy cotton-like processed form being easily handled. The advertisement includes an easy to remember catch-phrase: "The Magic Mineral."

Fig. 9. (below) 1970s Johns-Manville advertisement celebrating the "benefits" of asbestos fiber.

exposure to asbestos causes respiratory-tract cancer, pleural and peritoneal mesothelioma (tumors of the membranes lining the chest and abdominal cavities and surrounding internal organs), as well as other forms of cancer, and that occupational exposure to complex mixtures of asbestos increases the risk of lung cancer.[28]

DELTA Group's new report gives an estimate of the types of pollutants people were exposed to at Ground Zero. When the Twin Towers collapsed tons of concrete, glass, furniture, carpets, insulation, asbestos, arsenic, benzene, benzopyrene, cadmium dioxins, fibreglass, gypsum, heavy metals, plastic, silica, PAHs, PCBs, smoke detectors, mercury and gold (from several thousand fluorescent light bulbs), lead from thousands of computer monitors and titanium from the paint on the WTC walls, computers, and paper were reduced to enormous, oxygen-poor debris piles that burned until December 19, 2001.[29] In that pile, some of the materials that had combined with organic matter and the abundant chlorine from papers and plastics then escaped to the surface as metal-rich gases. They either burned or decomposed into very fine particles capable of penetrating deeply into human lungs. In the air samples, four classes of particles were identified that have been named by the EPA as likely to harm human health. For each of these pollutants, the DELTA Group scientists recorded the highest levels in their careers. After the debris fire was out, pollution levels dropped. As the DELTA group noted:

> The debris pile acted like a chemical factory. It cooked together the components of the buildings and their contents, including enormous numbers of computers, and gave off gases of toxic metals, acids and organics for at least six weeks.[30]

The effect of several toxins coming together in an "amalgam" reaction increased the hazardous nature of each material, making this hazard larger than the sum of its parts.[31]

In the early hours of September 11, 2001, NYPD Detective James Zadroga arrived at Ground Zero in Lower Manhattan to take part in the recovery efforts. He stepped onto this debris pile and took his first breath on site.

When breathing this debris pile, one inevitably inhaled the amalgamated toxicity of September 11: the building itself, the planes, their components and the trash that makes our daily environment, as well as the traces of human bodies, and with these smaller traces of the drugs they themselves

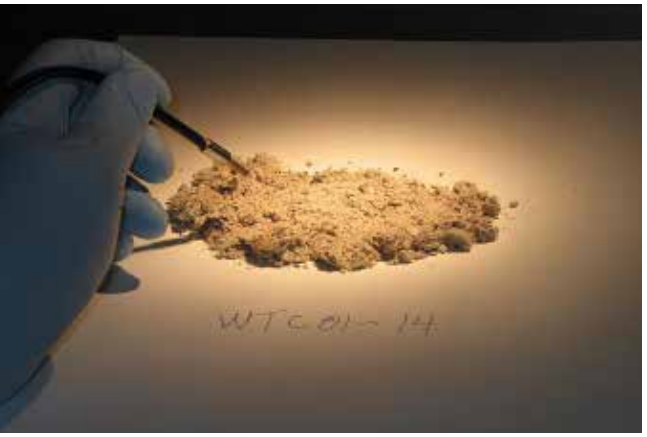




Fig. 10. (left) Closeup of sample WTC01-14 being measured with a spectrometer. The black cord with the steel tip is the fiber-optic probe of the spectrometer. Source: United States Geological Survey (USGC).

Fig. 11. (right) Photograph of WTC dust. Source: www.archive.org.

had been taking. With the body, buildings, objects, and other bodies intermeshed in this way, the source of any toxic element found in the "assembled" body becomes inextricable. The capacity to link the original source (the microfibers or molecules in the air) to the forensic evidence in order to make legal claims on the part of the "forgotten victims" of September 11 thus remains a difficult venture.

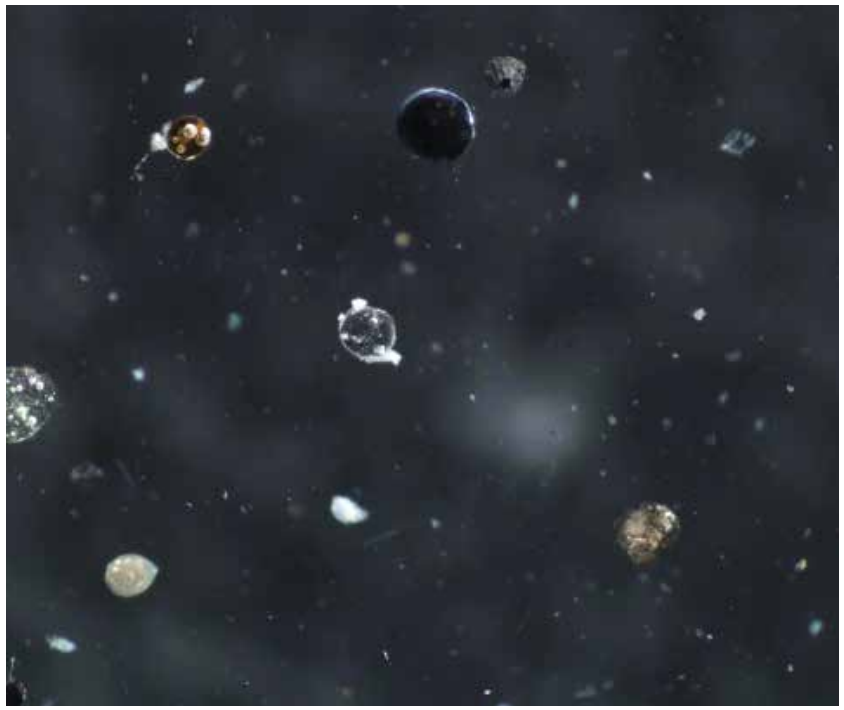


Fig. 12. Microsphere image of WTC dust. Source: www.archive.org.

1 Francis Bacon, interviewed by Joshua Gilder in "I Think about Death Every Day," *Flash Art*, no. 112 (May 1983): 17–21. Cited in Wilson Yates, "Francis Bacon: The Iconography of Crucifixion, Grotesque Imagery, and Religious Meaning," in *The Grotesque in Art and Literature: Theological Reflections*, eds. James Luther Adams and Wilson Yates (Cambridge: Wm. B. Eerdmans Publishing Co., 1997), 143–92, at 146.

2 Interview with Joseph Zadroga in Penny Little, dir., *911: Dust and Deceit at the World Trade Center* (USA, 2007), 60 min.

3 See for instance "9/11 Truth Movement," http://www.911truth.org, last accessed November 2013.

4 For a related forensic analysis of dust as a "material witness" in which buildings and humans were radically entangled, see Susan Schuppli, "Impure Matter: A Forensics of WTC Dust," in *Savage Objects,* ed. Godofredo Pereira (Guimarães: Fundaçao Cidade de Guimarães, 2012), 120–40.

5 Jennifer Kahn, "A cloud of smoke: The complicated death of a 9/11 hero," *New Yorker*, September 15, 2008.

6 Ibid.

7 Anthony DePalma, "Debate Revives as 9/11 Dust Is Called Fatal," *New York Times*, April 14, 2006. The term "reasonable degree of certainty" is the standard term used in court by forensic experts to mean that, given the available information, it is very likely that the opinion is correct.

8 Ibid.

9 Steven Connor, "Pulverulence," *Cabinet*, no. 35 (Fall 2009): 71–76, at 71.

10 Christopher Turner, "Bacon Dust," *Cabinet*, no. 35 (Fall 2009): 79–81, at 80.

11 Anthony DePalma, "Judge Dismisses 9/11 Suit Against Former Head of E.P.A.," *New York Times*, April 23, 2008. On April 22, 2008, the United States Court of Appeals for the Second Circuit overruled the district court, stating that Todd Whitman could not be held liable for her public statements to New Yorkers that the air was "safe to breathe" after 9/11. *Benzman v. Whitman*, 523 F.3d 119 (2d Cir. 2008).

12 *Benzman v. Whitman,* No. 04 Civ. 1888, 2006 WL 250527 (S.D.N.Y. Feb. 2, 2006). See also Jerrold Nadler, "Court Approves Key Components of Lawsuit Against EPA for Failure to Clean up WTC Dust," Congressman Jerrold Nadler's Website, February 1, 2006, http://nadler.house.gov/press-release/court-approves-key-components-lawsuit-against-epa-failure-clean-wtc-dust.

13 Kahn, "A cloud of smoke."

14 Michael Cooper, "Pataki Signs Law Increasing Death Benefits for Ground Zero Workers," *New York Times*, August 14, 2006.

15 Kahn, "A cloud of smoke."

16 See Sheila Jasanoff, "Thin Air," in *Débordements—Mélanges offerts à Michel Callo*, ed. Madeleine Akrich (Paris: Presses de Mines, 2010), 191–201, at 201. Jasanoff states in her essay that it was law that brought the air back under physical, economic, and political control in regard to the case *Massachusetts v. Environmental Protection Agency*, 549 US 497 in 2007.

17 Melissa Grace, "City says drug use, not dust, killed 9/11 hero James Zadroga," *NY Daily News*, October 26, 2007.

18 Nini S. Moordhead, "Bloomberg Recants HSPH Comment," *Harvard Crimson*, November 1, 2007.

19 Interview with Congressman Jerrold Nadler in Little, *Dust and Deceit*.

20 Editorial, "Trade Center air laden with very fine particles, DELTA scientists find," *California Agriculture*, vol. 56, no. 3 (May–June 2002): 84.

21 See "World Trade Center USGS Bulk Chemistry Results," United States Geological Survey (USGS), http://pubs.usgs.gov/of/2001/ofr-01-0429/chem1/index.html, last accessed September 2013.

22 See "Asbestos and the World Trade Center," http://www.asbestos.com/world-trade-center/, last accessed September 2013.

23 Andrew Schlafly, "Did Flawed Science and Litigation Help Bring Down the World Trade Center?" *Journal of American Physicians and Surgeons*, vol. 8, no. 3 (Fall 2003): 89–93.

24 Cited in James Glanz and Andrew C. Revkin, "Haunting question: Did the ban on asbestos lead to loss of life?" *Vaccination News*, September 18, 2001, http://www.vaccinationnews.com/DailyNews/September2001/Asbestos.htm.

25 Cited in Steven Miller, "Cautionary tale: Al Qaeda's unseen ally: Environmental extremism," Nevada Policy Research Institute Issue Brief, December 11, 2001, http://www.npri.org/publications/a-cautionary-tale.

26 See "Asbestos and the World Trade Center."

27 Ibid.

28 The International Agency for Research on Cancer (IARC) concluded that there was sufficient evidence for the carcinogenicity of asbestos in humans. See IARC Summaries & Evaluations, "Asbestos," Supplement 7, *International Programme on Chemical Safety* (1987): 106, http://www.inchem.org/documents/iarc/suppl7/asbestos.html.

29 Robin Herbert, Jacqueline Moline, et al., "The World Trade Center Disaster and the Health of Workers: Five-Year Assessment of a Unique Medical Screening Program," *Environ Health Perspect*, vol. 114, no. 12 (December 2006): 1853–58. The study found that nearly 70% of WTC rescue and recovery workers suffered new or worsened respiratory symptoms while performing work at the WTC site. The study was established to identify possible WTC-related health effects in responders. It found that about 28% of those tested had abnormal lung function tests, and 61% of those without previous health problems developed respiratory symptoms. However, it is important to note that these symptoms may be related to exposure to debris components other than asbestos.

30 DELTA report, cited in "Trade Center Debris Pile Was a Chemical Factory, Says New Study," *UC Davis News and Information*, September 10, 2003, http://news.ucdavis.edu/search/news_detail.lasso?id=6679.

31 An amalgam is a substance formed by the reaction of mercury with another metal. Almost all metals can form amalgams with mercury, the notable exception being iron.

RUINS UNDER CONSTRUCTION

Gabriel Cuéllar

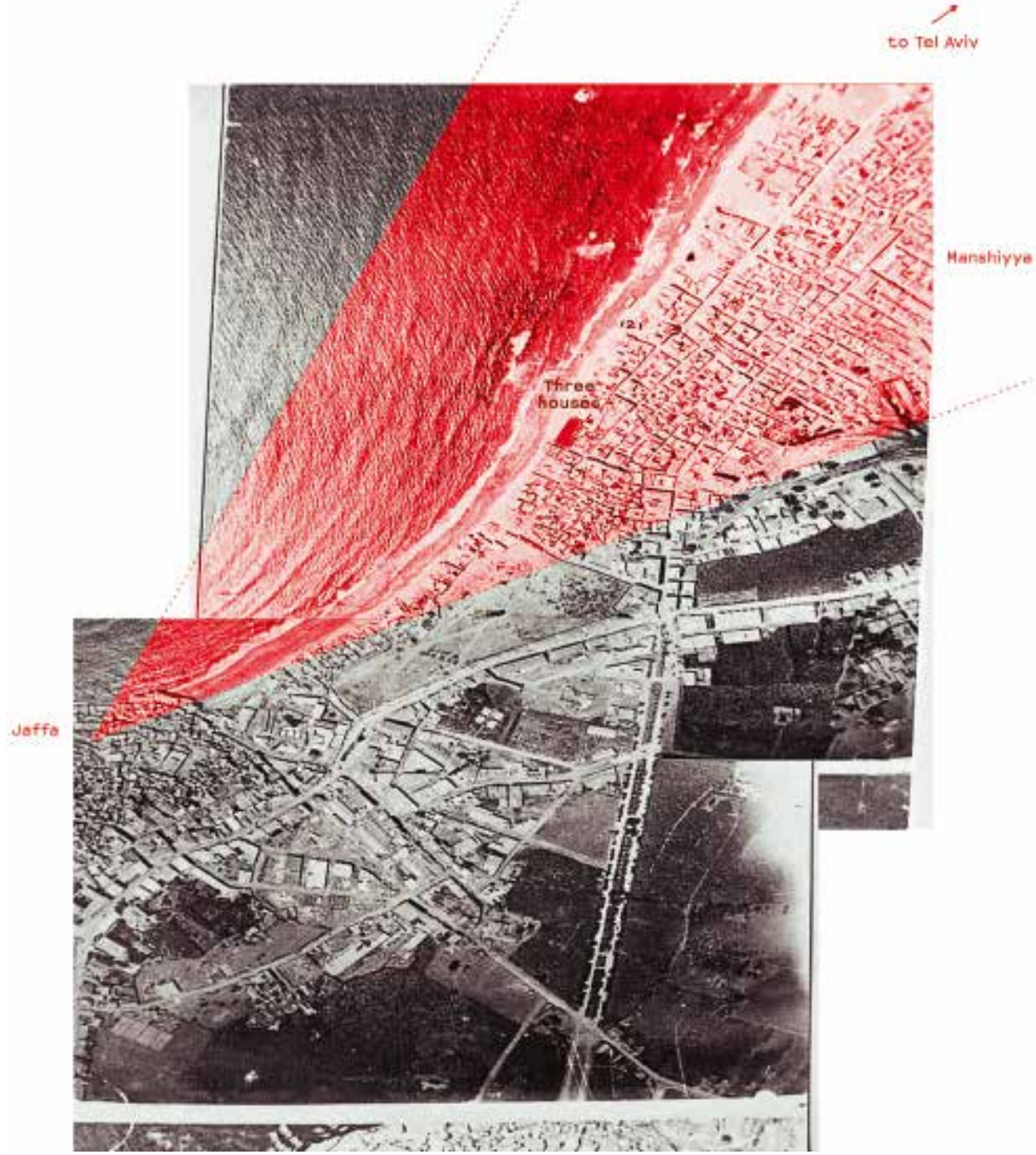
In the autumn of 1976, three Israeli architects slogged through the rubble of the beach of Manshiyya—previously the northernmost neighborhood of Jaffa, and now the southern edge of Tel Aviv—scouting for a suitable site on which to erect a museum commemorating Etzel, the nationalist Zionist paramilitary group that occupied and partially demolished Jaffa in 1948. Stumbling across several beach ruins that day, one assemblage formed by the wreckage of three houses caught their attention. The team later wrote that they were struck by the ruins' particular "power of survival," despite having "crumbled over the years by the sea breezes." Their interpretation of the ruins as a product of natural deterioration was the first chapter of an architectural chronicle that aimed to radically renarrate the history of the three houses and, through them, the very history of Jaffa.

The museum they built appears to be an innocent trace of the past, carefully set into Tel Aviv's beachside park. Historical photographs, maps, and films that show the transformations of the site over time, however, make manifest another story, a counternarrative to the building completed some six years after their trek on the beach.

An investigation of Jaffa through its appearance in photographs exposes an archive of traces that offers an alternative account to the city's commonly recognized history. Rather than the material excavation typical of biblical archaeology in Palestine, this project performs archaeology by exhuming the details, grains, and pixels captured in media representations. It is in this media reality that Manshiyya's buried history, defined most strongly by a slow and unswerving course toward erasure, can be uncovered. The narration of the neighborhood's destruction is made possible by circumstances that are unexpectedly ordinary: since the end of the nineteenth century, Jaffa, more than anywhere else in Palestine, has been captured by the lenses of travelers, administrators, amateur photographers, and filmmakers time and time again.

A popular photographic vantage point emerged in Jaffa in the late 1920s. As Tel Aviv expanded north of the city, photographers began scaling the Jaffa hill in order to capture the burgeoning panorama of the twin cities. That perspective, however, always included Manshiyya, which is unfailingly present in the foreground of photographs taken from the hill. For this reason, most early portrayals of Tel Aviv are also—indirectly—portraits of Manshiyya and, consequently, of the three beachfront houses. Their consistent appearance in foreground of most photographs taken over the course of nearly a century allows the neighborhood's biography to be reconstructed.

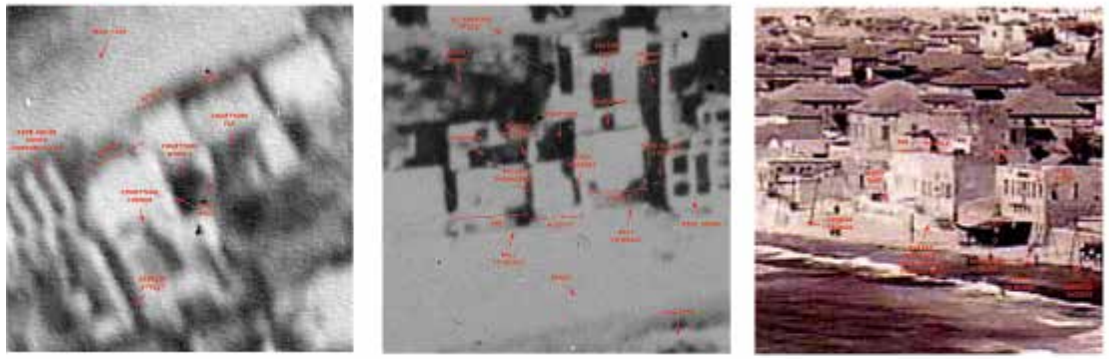
An earlier version of this article was first published by Alessandro Petti, Sandi Hilal, and Eyal Weizman (DAAR) in *Architecture after Revolution* (Berlin: Sternberg Press, 2013). The article began as a thesis project in the postgraduate architecture studio course tutored by DAAR at the Berlage Institute in Rotterdam during 2011–2012 together with Lieven De Cauter. A larger body of collaborative work was created by students Sanne van den Breemer, Patricia Fernandes, Zhongqi Ren, Sai Shu, and Rizki M. Supratman. The studio projects were DAAR's contribution to the "Return to Jaffa-Tel Aviv" project commissioned by Badil, the Resource Center for Palestinian Residency and Refugee Rights, and Zochrot, a nonprofit organization that aims to promote awareness of the Nakba.



Aerial view of the old city of Jaffa (bottom left) and Manshiyya (top right) in 1924. The red cone represents the field of view commonly found in early photographs of Tel Aviv. At that height and angle, Manshiyya's beachside houses are also visible.

Year:	1917	Year:	1918	Year:	1930
Author:	Bavarian Flight Division 304b	Author:	Bavarian Flight Division 304b	Author:	Unknown
Source:	Bayerisches Hauptstaatsarchiv	Source:	Bayerisches Hauptstaatsarchiv	Source:	Jewish Museum Vienna

Zoom



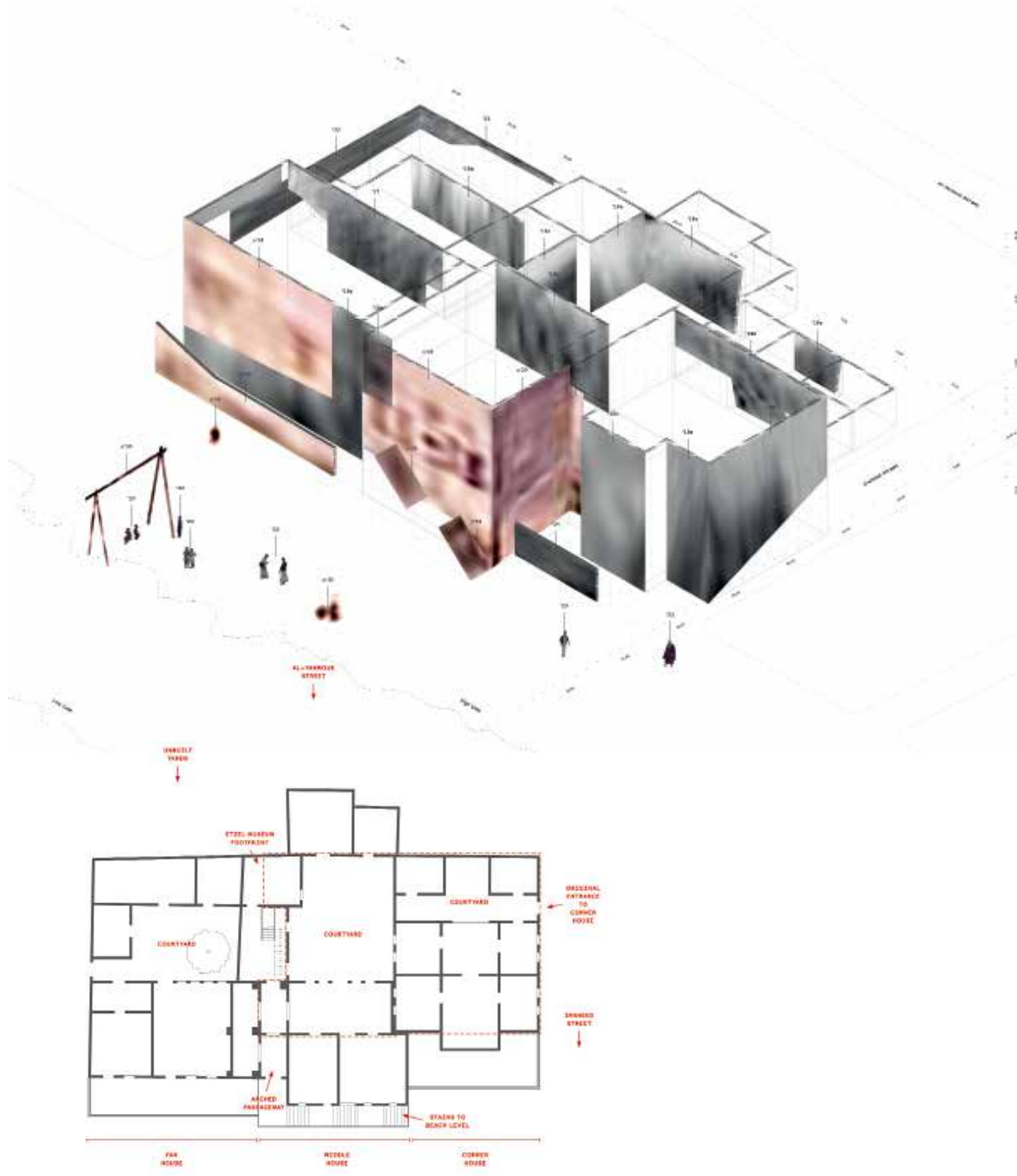
Full image



Cutouts



1917–1950 / Manshiyya's Beach Market
Lively scenes of activity took place along the section of beach directly in front of the three houses. In the 1930s, a number of wooden swings are seen installed on a sliver of beach at high tide. Another image shows vendors of grilled meat and ice cream. These vivid beach episodes came to a halt in 1948 when the Tel Aviv City Council forcibly evicted the Palestinians still living in Manshiyya after the Nakba and completely razed the city blocks closest to Tel Aviv. Nevertheless, the vast majority of Manshiyya's urban fabric was left intact.



The row of visual fragments at the bottom of each archive entry has been cut out from the corresponding photograph. Fragments from multiple images have been composed together in order to three-dimensionally reconstruct the isometric images that follow. Six key moments in the three houses' transformation have been visualized using this method.

Year: 1934
Author: Dr. Hans Scheurer
Source: PikiWiki Israel

Year: 1960, ca.
Author: Unknown
Source: http://www.flickr.com
/photos/milleliri/6022138801/

Year: 1963
Author: Unknown
Source: eBay

Zoom







Full image



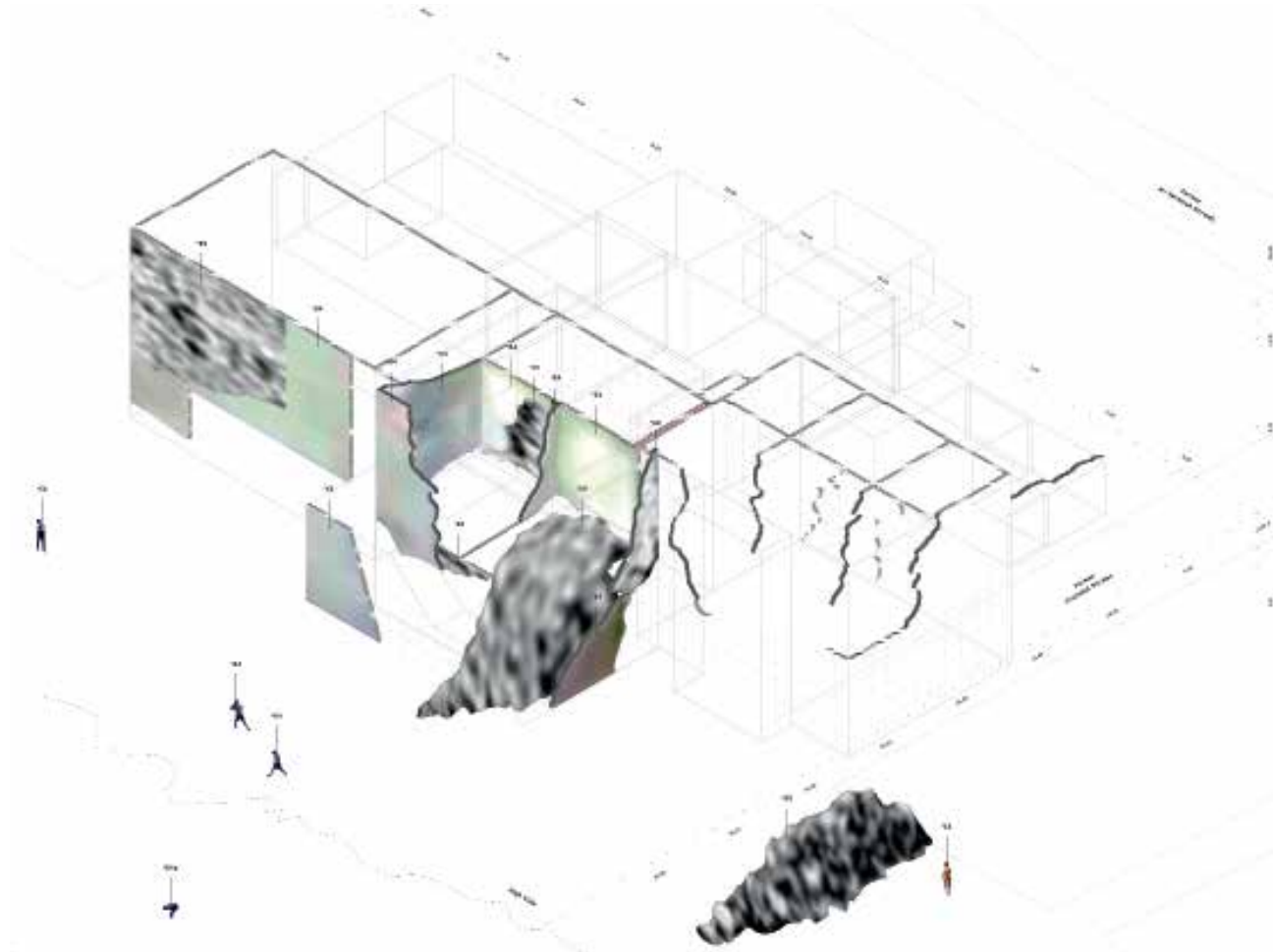




Cutouts



1950–1959 / Population Exchange
In the years immediately following the establishment of Israel, Manshiyya was largely abandoned and any residents who survived the ethnic cleansing of 1948 were expelled to neighborhoods distant from Tel Aviv. Starting in the late 1950s, the deserted houses were divided up and illegally acquired to serve as a housing stock for newly arrived Jewish immigrants from Eastern Europe.





Year: 1965
Author: –
Source: Skyscraper City Internet forum

Year: 1968, ca.
Author: –
Source: Waymarking Internet forum

Year: 1969, ca.
Author: –
Source: Televizia Internet forum

Zoom







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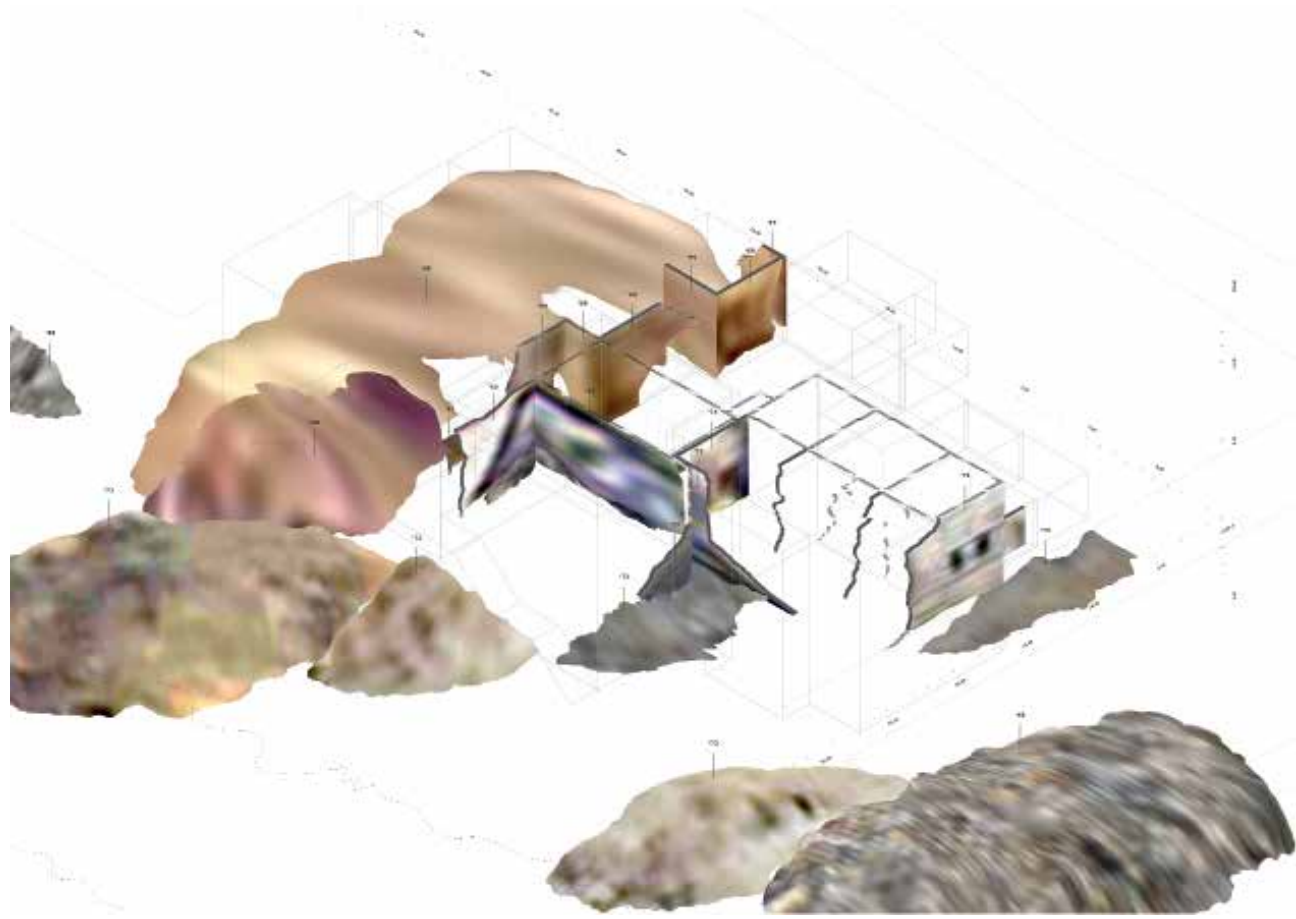


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1959–1973 / Rubble Landscape
As stronger migrant communities left the neighborhood, Manshiyya remained the home of the underprivileged. The municipality condemned the neighborhood as a slum and steadily demolished it house by house, evicting the remaining residents but leaving the rubble in place. A great volume of building debris was created as a result. The plight of those evicted from the neighborhood—now mainly Sephardi Jews—was represented in the 1973 Israeli musical *Kazablan*. Among the few survivors of the protracted demolition campaign, the three houses were now virtually swimming in the rubble of their neighbors.

Year: 1974
Author: Menahem Golan, director
Source: Kazablan DVD film

Year: 1974
Author: Piva Paolo
Source: Panoramio internet forum

Year: 1975
Author: State of Israel
Source: Israel Antiquities Authority

Zoom







Full image



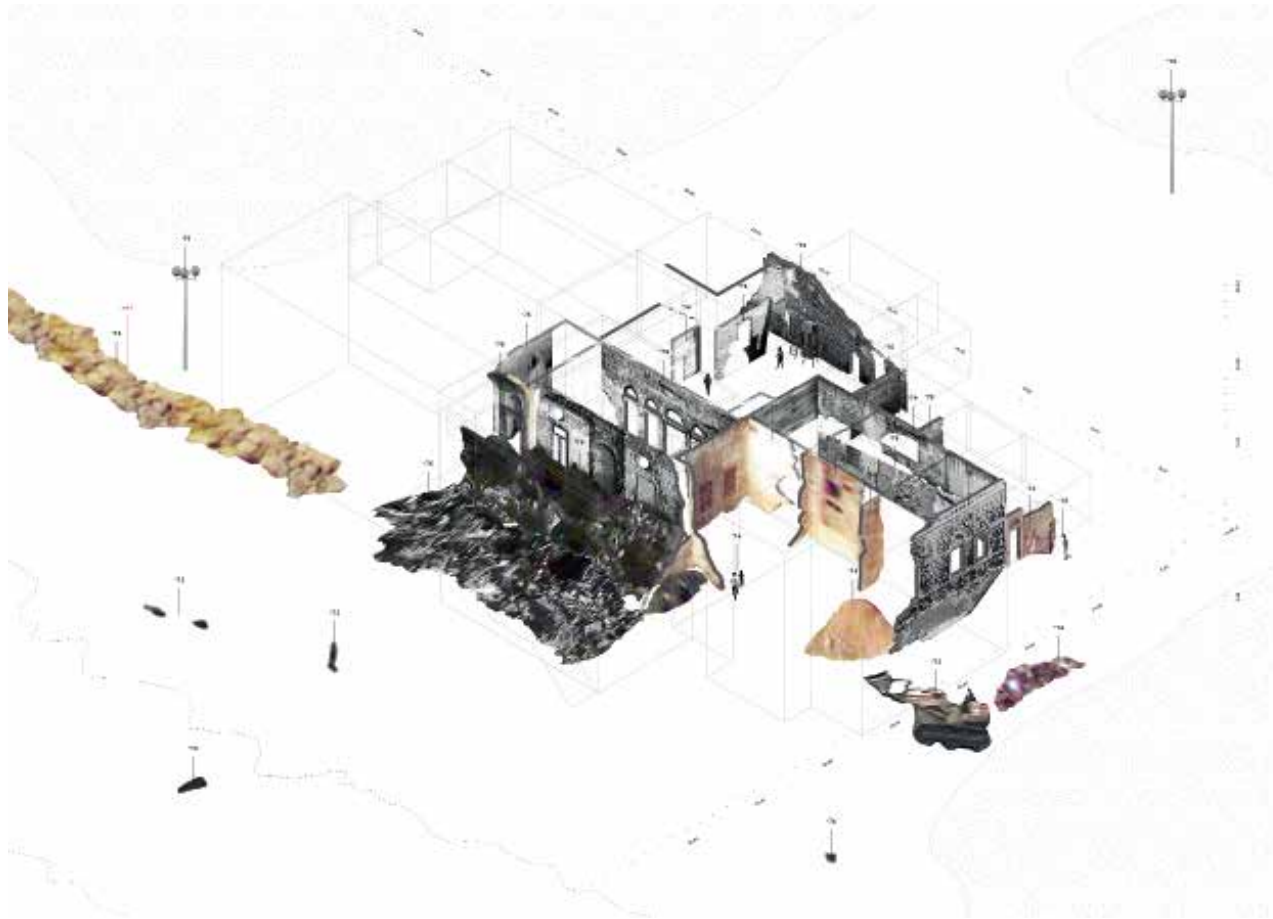




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1973–1982 / Military Archaeology
By the mid-1970s, as more homes were destroyed, the rubble piled ever higher. Eventually, the beach-level ground floors of the remaining houses were engulfed in more than four meters of granulated remains of the razed neighboring structures. It was during this period that the three architects began to design the Etzel Museum. When they visited the site, they were greeted by an Eastern European family who had been inhabiting the ruins. Shortly thereafter, that family was evicted and the ruins of the three houses were fenced off. The architects then proceeded to draw the master plan for the now leveled Manshiyya neighborhood. A hand sketch prepared by the lead architect Amnon Niv depicted Tel Aviv's modern towers on the horizon against the neatly flattened wreckage of Manshiyya in the foreground. In this vast modern scene, there was only one house left to draw, the Etzel Museum.

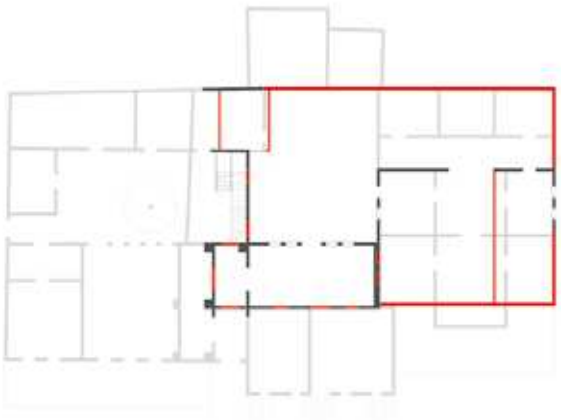












When the Etzel Museum opened in 1983, its three architects, in unison with the Israeli Antiquities Authority and Military Museum Unit, claimed against all available evidence that the ruins constituted a single house constructed in 1900 under the charge of a Russian Zionist. Considering Jaffa's characteristic density, it is remarkable that the architects insisted that these ruins, in the company of numerous other ruins at the time, represented the remains of one, single building. Their narrative, and indeed the Museum as built, negates the history of the city of Jaffa. Consequently, in order to construct the museum and despite having pledged to do their "best to respect the remains," they had to destroy many of the ruined walls that remained there. Manifesting their egregious historical account in architectural form, a modern glass box was built over low concrete walls veneered with historic stonework, "schematically completing the building to what it was." The so-called preservation of the ruins brought disparate building fragments together, conjuring the image of a single, officially "well-preserved" Zionist house. Taking into account the Israel Antiquities Authority's principal goal to "preserve all elements in situ," forensic architectural analysis here exposes the underlying negation built into the museum. The media archaeology of Manshiyya's ruins thus exposes an instance of Tel Aviv's inherent schizophrenia.

ASSEMBLIES



Entering Evidence: Cross-Examining the Court Records of the ICTY

Susan Schuppli



Fig. 1. "As conflict rages across the former Yugoslavia, the Security Council, spurred to action by reports of atrocities and pressure from international public opinion, unanimously adopts Resolution 827, formally establishing the International Criminal Tribunal for the former Yugoslavia." 3217th meeting of the Security Council, May 25, 1993, New York. Source: ICTY.



Fig. 2. ICTY Court in session in The Hague. Photo: REUTERS/Damir Sagolj.

Part I: The Archive

> It is wrong always, everywhere, and for everyone, to believe anything upon insufficient evidence.
> —William James[1]

On February 11, 1994, the United Nations adopted the "Rules of Procedure and Evidence pursuant to Article 15 of the Statute of the International Tribunal for the Prosecution of Persons Responsible for Serious Violations of International Humanitarian Law Committed in the Territory of the Former Yugoslavia since 1991." This document would set in motion the juridical apparatus and evidential protocols for the investigation and prosecution of alleged war-crimes taking place in the Balkans. Reports of grave wrongdoings in Bosnia and mounting pressure from the international community had prompted the UN Security Council to establish the International Criminal Tribunal for the Former Yugoslavia (ICTY) one year earlier on May 25, 1993, in accordance with Resolution 827. This temporary ad hoc institution was granted specific prosecutorial jurisdiction over allegations of crimes against humanity committed across the territories of the former Yugoslavia.

"When the first judges arrived at the Tribunal in November 1993, there were no rules of procedure, no cases and no prosecutor. By the time the first prosecutor arrived in the Hague in August 1994, the judges had drafted the Rules of Procedure and Evidence, and the Deputy Prosecutor had set up the structures of the Office of the Prosecutor (OTP), and recruited the first investigators and begun mounting investigations in what was, in some cases, hostile territory."[2] This document crafted by the judges lays down the 125 rules that provide the fundamental legal architecture of the entire Tribunal, from its organizational structure, prosecutorial operations, witness management, and evidentiary processes, to its technical and media requirements.[3] It has been amended forty-nine times over the lifetime of the Tribunal, which is now in its final stages, with only four cases still on trial and seven more on appeal.

As a quasi-historic body with the majority of its cases completed and sentencing rendered, thousands of the ICTY's Court Records have been made public and are accessible online or by written request. These artifacts stand not only as a comprehensive legal archive of the first international criminal law court—the product of a process of war-crimes prosecution that began with the Nuremberg and Tokyo Trials in the 1940s and continued with the further creation of the International Criminal Tribunal for Rwanda (UNICTR) in 1994—they also provide extraordinary insight into the complex inner workings of an international court. In particular, they disclose the procedures and practices that convert testimony and material artifacts into matters of legal evidence capable of presiding over questions of public truth.

These unrestricted offerings are of course a small fraction of the actual volume of materials gathered and records produced by the Tribunal since its inception in 1993. Full disclosure with provisions for protected witnesses remains one of its core ambitions.[4] Today the vast archival holdings of the ICTY exceed 9.3 million entries and include photographs, diaries, maps, diagrams, exhumation records, X-rays, radio intercepts, audio recordings and videotapes, as well as physical objects such as scale models, computer hard drives, personal effects, munitions, and even remnants of charred timber and stone. All is here, save biohazardous materials such as blood-soaked clothing, which would have been documented and then disposed of. By 2010, the ICTY Court Records required 3,704 meters of storage shelving. In addition to OTP exhibits, transcripts of the cases and procedural documents are also scanned and entered into the e-court database of the Records of the Trial and Appeals Chambers.

I have been particularly interested in examining the issues that arise when media and other non-textual evidence enters into legal proceedings as a "material witness" entrusted with the task of testifying to history. An important dimension of this overall research, to which my exploration into the ICTY Court Records contributes, has been to conceptually interrogate the ways in which the postproduction treatment of media materials—their copying, editing, digitizing, and chain-of-custody handling—impacts upon their evidentiary capacity to produce the truth claims that are required for "the justice of law" to answer to the "injustices of war."[5] This is especially pertinent to materials coming out of conflict zones that are often produced under extremely challenging conditions. A textbook case that I encountered during my research was that of the collapse of the Old Bridge in Mostar, in which corroborating video evidence was thrown into doubt when an expert witness proved that the videotape in question had been spliced and reedited, thus nullifying the argument that the bridge was not intentionally destroyed through shelling.[6] The poor quality of many videotapes in the custody of the OTP could raise serious legal challenges, because courts typically rely upon unadulterated materials to assert the legal merits of evidence. While mobile-phone video uploads have dramatically increased the reach of citizen journalism when it comes to reporting human rights abuses, much of this online content is edited and captioned by its producers. Although this would be standard practice and wouldn't necessarily hinder the capacity of these materials to produce a public truth, such processing troubles the court and weakens the ability of jurists to make a legal truth using such evidence. If available, raw, unedited files—ideally burned directly to disc without being previewed in a software package such as iPhoto or QuickTime—are the gold standard of forensic human rights investigators. Nonetheless, previewed or edited versions are often the only materials that prosecutors have at their disposal to support or reject a legal claim. Disputes around accusations of genocide and war-crimes are thus archived by media whose status is in dispute not merely at the level of representation

but also potentially at the level of its composition, where corrupt data or technical inconsistencies can raise legal doubts. Furthermore, regardless of how materially compromised evidence might be prior to entering the administrative circuits of the court (decomposed objects recovered from a mass grave, clothing soiled by bodily fluids, documents damaged by moisture, videos hurriedly shot and copied) what emerges as one makes one's way through these archival holdings is ultimately the extent to which the Tribunal itself becomes a processing machine that works over the materials that enter its legal infrastructure, and in the process also actively transforms them.



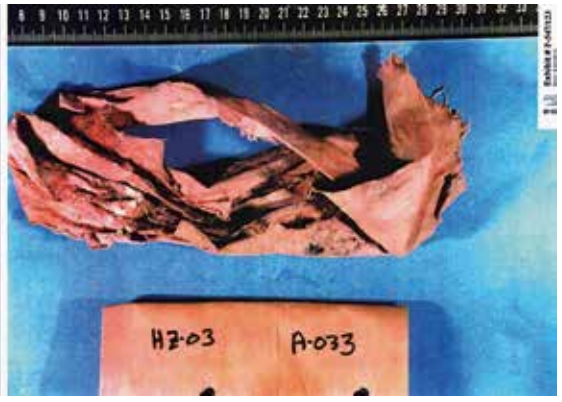


Fig. 3. Bullet taken from the Luka detention facility near Brčko, Bosnia and Herzegovina. Source: ICTY Court Records.

Fig. 4. Ligature used to bind a victim's hands in Srebrenica, unearthed during an exhumation in Srebrenica, Bosnia and Herzegovina. Source: ICTY Court Records.

In the early days of the Tribunal, unsolicited items arrived with regularity through the post—photo albums, family mementos, home movies, and private papers—sent as potential legal evidence from members of the public who had personal stakes in the outcome of the trials taking place in UN courtrooms in The Hague. These were all dutifully logged and evaluated by the OTP as to their evidential value, even though their chain-of-custody handling prior to their arrival at the court could not be corroborated. In some rare cases these items tendered by the public did make their way through the elaborate mechanisms of the Tribunal to become exhibits and are now archived among the evidential artifacts stored in the vaults of the OTP. The archives of the Tribunal are in fact divided into three areas of jurisdiction, which also mirror the tripartite structure of most international criminal courts: Chambers (courtrooms), Office of the Prosecutor (investigation and prosecution), and Registry (administrative functions). Each of these areas of responsibility generates records and in the case of the OTP, which also manages the evidence unit of the ICTY, are subject to strict guidelines as to the access, management, and conservation of such historically significant material. The archives of the ICTY are organized as follows:

i) *Records of the Trial and Appeals Chambers* holds all the documents produced by the daily functioning of the court, the most important of which are the records of court proceedings.

ii) *Records of the Office of the Prosecutor* holds all evidential material and is responsible for maintaining electronic evidence records. As of October 2004, the evidence unit contained:

- Paper, maps, still photographs, and photographic slides: 5,807,761 items
- Electronic scanned copies of the 5,807,761 items
- Audiotapes: 2,800 (some of 60 minutes, others of 90 or 120 minutes)
- Videotapes: 5,500 (some of 30 minutes, others of 60, 120 or 240 minutes)
- CDs: 1,500 (some 650 megabytes, others 700 megabytes)
- Artifacts: 13,200 (obtained as evidence or used in trials for explanatory purposes—physical objects are not technically records) [7]

iii) *Records of the Registry* holds the administrative paper records of the ICTY Registry including personnel and staff medical files.

All records of court proceedings are available online, and digital copies of evidential material are also systematically being made public through a searchable database as cases conclude and decisions over appeals are determined. However, the actual records and artifacts of the Office of the Prosecutor are sealed off from public scrutiny since the vast majority will never make their way into a case. Materials related to ongoing cases and appeals are also withheld. I was extremely fortunate to have been able to tour the OTP vault when I interviewed Bob Reid, Chief of Operations for the ICTY, and peer into several of its evidence boxes. It is in this archive that the most sensitive and rare materials are stored, including all the exhumation records and X-rays from Srebrenica as well as the eighteen Mladic notebooks, containing 3,500 pages of meticulous handwritten notes documenting every meeting that he (General Ratko Mladic) attended during the war in Bosnia from 1992 to 1995. These are, in fact, one of the few OTP seizures whose authenticity was questioned by the defense, requiring their extraction from the vault and scientific examination and verification by the Netherlands Forensic Institute. This forensic testing was demanded despite the fact that Mladic said they were his notebooks, which Karadzić confirmed, and that they were found hidden in Mladic's house behind a wall.[8]

Row upon row of brown archival storage boxes and grey files teeming with materials. The organizational schema of the OTP vault is disquietingly pragmatic yet also surprisingly idiosyncratic and lacks the high-tech facade that we have come to expect of secure storage facilities, such as that of Iron Mountain, located in a former limestone mine in Boyers, Pennsylvania, where Bill Gates's Corbis photographic collection is famously interred some sixty-seven meters below ground.[9] As a "temporary" court, the ICTY operates in the former Aegon Insurance Building, a retrofitted structure whose records storage will be replaced by a new purpose-built archive when the Tribunal closes.



Fig. 5. Vault of the Office of the Prosecutor. Photo: REUTERS/Damir Sagolj.



Fig. 6. Videotapes, CDs, and audio recordings in the vault of the Office of the Prosecutor. Photo: REUTERS/Damir Sagolj.

In the vault of the OTP the numeric labels assigned to each storage unit are preceded by a letter that immediately denotes their contents: *K* is for Kosovo, *O* for Omarska, *S* for Srebrenica, *X* for exhumation, *V* for videotape, *T* for transcript, and so on. If the vault is the de facto final resting place of the legal archive that now chronicles more than twenty years of war-crimes prosecution, the tumultuous journey of evidential materials from the field through the mechanisms of the Tribunal is itself contradicted by the mundane regularity and humble cardboard boxes that now house the legal traces of such heinous acts. Differentiated only by their numerical identification and the occasional Post-it note, these ordered boxes stand in stark contrast to the frenzied violence out of which their contents emerged. The only visible denotation of difference appeared when I rounded the corner of one aisle and noticed that neon-yellow triangular reflectors were affixed to a number of archival boxes. These luminescent markers signal an urgent salvage instruction for hard-copy records in the event of power failure or disaster, such as the flooding of the vault—they are the most valuable evidential records of the court and must be saved first.[10] The shocking Scorpion video, a Serbian paramilitary unit that captured its execution of six male Bosniak prisoners on tape as a perverse trophy recording, is stored within this screaming display of yellow-tagged high-priority boxes.[11]

The details of the future disclosure of these OTP evidential records, and those of the ICTY more generally, have yet to be fully agreed upon, as they are complicated not only by the sheer volume of records that require retention appraisal—what to save and/or destroy—but also by the question as to what should be revisited and translated. "Between 1994 and 2000, both the complete and the public-use versions of the videotape [of courtroom proceedings] carried only the sound of the floor language and, in some cases, the English interpretation. This means that prior to 2001, the audiotapes are the only source for all interpreted languages."[12] The publication of court records also raises issues concerning the treatment of classified documents and of how to maintain ongoing protection for witnesses. Nonetheless, provisions are underway to house the entirety of the ICTY archives in a permanent facility in The Hague as a legacy project—in contrast to earlier plans to sequester them in New York, as is standard practice for a UN body that has completed its mandate. Even this decision—to maintain the archives in Europe—has been controversial, in that many legal scholars and historians contend that these materials should be returned to the nations of the former Yugoslavia as part of their legal heritage and made available as a localized resource in the areas where their impact and access will be most deeply felt. I too would argue for the records to be returned to their local contexts, as the museological approach of housing the artifactual legacies of the weak in the institutions of the strong reenacts the asymmetries of power that contributed to the conflicts in the first place. The imaging and digitization of its complete holdings suggests that a virtual version of the ICTY archives will be the compromise solution.[13] During my conversation with Bob Reid, he mentioned in passing that scores of letters requesting further





Figs. 7, 8. ICTY audio-visual booths. Courtesy of the ICTY.

indictments were regularly received from members of the public, including requests to the prosecutor to lay war-crimes charges against George W. Bush and Tony Blair for the invasion of Iraq. These too are filed away somewhere in the OTP as a faint echo of the more radical potential of the court to pursue injustice wherever it might appear, in spite of the ICTY's specific mandate to try the violations that took place during the Balkan conflicts of the 1990s. These misplaced demands, whether in the form of offerings of evidence or prosecutorial requests, suggest that the ICTY has entered public consciousness as *the* global war-crimes Tribunal.

Arguably the most significant records of the Tribunal are those documenting the legal proceedings of the trials themselves. "The audiovisual recording of the proceedings at the ICTY was decided by the Judges as early as 1994 for three main reasons: to make sure that justice would be seen to be done, to dispel any misunderstandings that might otherwise arise as to the role and the nature of the Tribunal proceedings and to fulfill the educational task of the Tribunal."[14] A 1998 study commissioned by the ICTY and conducted by Dr. Paul Mason (Coordinator of the Centre for Media and Justice at Southampton Institute, UK) reviewed the impact that such "gavel-to-gavel" audiovisual coverage had on the courts' proceedings and reported that "there was a general consensus that court participants are not affected by cameras in court. This was true in both self-assessment and in evaluation of the impact of cameras upon other court participants. […] Cameras can inform the international community of the workings of the Tribunal whilst ensuring a transparent and fair system of justice is in operation. It was suggested by many that the audio-visual policy of the Tribunal could be successfully adopted by other international judicial proceedings, including the Lockerbie trial. There was uncertainty concerning televising domestic court proceedings."[15] In May 2005 archivist Trudy Huskamp Peterson of the National Peace Foundation (USA) conducted another survey of ICTY court proceedings and found that every hour in court results in the production of four written transcripts and twelve to fourteen audiovisual recordings in each of the languages of the Tribunal. An inventory of all the audiovisual recordings of proceedings generated by the court up until that time tallied at 75,868 units made up variously of CDs, audiocassettes, and videotapes.[16]

Part II: The Evidence

> The most savage controversies are about matters as to which there is no good evidence either way.
> —Bertrand Russell[17]

The following excerpt is taken from the transcript of a Status Conference on the Tribunal in 2005. Case IT-05-87-PT, the Prosecutor versus Milan Milutinović and others:

MR. ACKERMAN: Since being assigned to this case, I've received I believe 206 CDs. That number may be a little soft; it may be 208 or 204. And I understand there are more to come. Mr. Bakrac tells me he's received 280, which means I may have another 74 or something headed my way. I don't know the basis for that discrepancy at all.

In the time I've been assigned, I have concentrated a significant portion of my time on just trying to figure out what is on each of those CDs. I've managed to get through 80 of them in the last 30 days or so, and that doesn't mean I'm looking at them for content particularly but to determine what they are and thereby know whether to assign them to another member of my staff. For instance, a number of them are either one-hour or two-hour broadcasts of news programmes from Belgrade television during the course of the war in Kosovo. I can't understand a thing that's on those, and so I have to send those off to my co-counsel in Belgrade to have him look at them and determine what they contain. That process, obviously, is going to take a significant additional time just to make the preliminary decision regarding those, and then extracting the content is another matter entirely.

There is the electronic disclosure materials. When I first came on the case, I think there were two batches there, maybe three. It's now risen to five just in the short time that I've been there.

JUDGE BONOMY: Is there any reason to think, though, that there is material which isn't on the CDs?

MR. ACKERMAN: It's definitely not on the CDs. […] The Prosecution cannot tell me how many pages of material are there. The estimates that I've heard range between 250.000 pages and 1 million pages.[…] We throw these numbers around in this Tribunal to the point where they have, I think, lost meaning in terms of the number of pages of discovery. 250.000 pages of material

is an overwhelming amount of material, Your Honour. If you put it in binders at 500 pages per binder, you've got 500 binders of material. It's 500, 500-page books. I told you reading at two minutes per page, a 40-hour week, it would take 208 weeks just to read it. Just to read it. So two counsel working on it couldn't even complete in a year and get through the material. And that's the EDS material.[…]

There are the 12 expert reports that you've suggested today that I need to make a rather priority and get those and read through those. I don't have any idea how many pages that is and how long it will take me.[…] There are I don't know how many witness statements that are disclosed in various ways that I will need to deal with. […]

JUDGE BONOMY: Are you saying that the 206 CDs plus the EDS material is not witness statements? Witness statements are over and above that?

MR. ACKERMAN: I don't think so. I think they're contained within that material. I don't know but I think they are. I think that's — it's fair to assume that they are.[…] Your Honour, to understand, it is not just reading through the material. If that were all that was involved, it would make the matter much easier. It is analysing that material, correlating that material, cross-referencing that material, getting that material into some form so that if — if I need in the future something that I remember having read as I go through this I'll know how to find it, where it is. I'll have cross-reference it had in some way that I can use of it.[…]

I've suggested if you just take the EDS material, reading it two minutes per page, two counsel, two years — one year, two counsel, one year just to get through that, I think it's a reasonable estimate, Your Honour, that in compliance with the Statute of this Tribunal that I cannot be ready to try this case before about the fall of 2007, and that's if we don'thave a major problem arising out of this new 1998 material which I didn't consider when I filed my opposition to the motion for joinder.

It would be — it would be malpractice and a violation of my oath as a counsel and a violation of the — of the ethical standards both in the bar to which I belong and the — and this Tribunal to go to trial without having properly prepared. I couldn't possibly go to trial with not having read, for instance, every page of the Rule 68 material.[…]

JUDGE BONOMY: We're going to have a break shortly because we have little time left on the tape, so can you give me some indication of timing here? We're not far from the end of the Status Conference but it's in your hands.

MR. ACKERMAN: I think my speech is virtually ended, Your Honour.[18]

This exchange between Judge Bonomy and Mr. Ackerman, defense co-counsel, detailed in a status conference from August 25, 2005, emphasizes the magnitude of information that is generated by a single case in the ICTY and explains why there are 9.3-million-plus artifacts in its archives—a huge percentage of which are self-generated. But it also highlights the multiple media platforms that participate in staging the mise-en-scène of International Humanitarian Law (IHL) as well as the additional complications such technologies introduce. What is perhaps even more revealing in this contretemps between judge and defense is the degree to which Ackerman must first engage with the materials quantitatively, when one might well expect a war-crimes tribunal to be overly preoccupied with the qualitative dimensions of data. His ethical obligation to mount a meticulous defense is challenged by the sheer volume of material he must process, combined with his inability to comprehend the Serbian audio recordings that also grow daily in number, and which he must in turn outsource for translation. Ackerman's frustration has turned him into a calculating machine … counting pages, indexing documents, scanning audio CDs, and marking time. But so too is the judge himself a timekeeper as he hurries Ackerman along, noting that the time left on the tape is fast running out.

This tension between the quantitative dimensions of a trial, its metadata so to speak, and the qualitative, content-rich information disclosed by its records through the testimonials of witnesses and experts, will come to play a crucial role in our understanding of how and by what procedures such legal records become evidential or significant of something in the first place; that is to say, even before the particularities of their content (their encoded subjectivities) are explicated in court. Elsewhere I refer to this condition of double-articulation as that of the "material witness."[19] By this I mean an entity (object or unit) whose physical properties or technical organization not only records evidence of passing events to which it can actively bear witness (the material crime-scene evidence sequestered in the vaults of the OTP, for example), but also the means by which the event of evidence is itself made manifest (the rules of procedure and evidence that govern the presentation of such materials in court and adjudicate over their admission into evidence). In developing the concept of the material witness I have primarily examined media artifacts, which archive trace-evidence of the violent events that generated their context and explore the ways in which these materials enter into various public forums as agents of dispute. These are materials that have come out of situations of political conflict and crisis—images, for example, whose content bruises the public eye—but they are also materials that have had violence done to them. Matter, in effect, only becomes



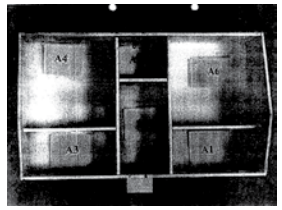


MAP OF VILLAGE OF KISTANJE AREA





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A2
A3
A1

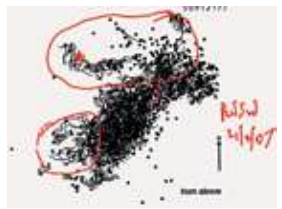


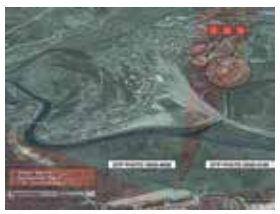



"Smrt jednog vojnika"
prašio je kasnije u novinama.

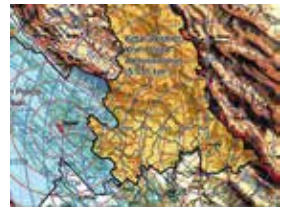
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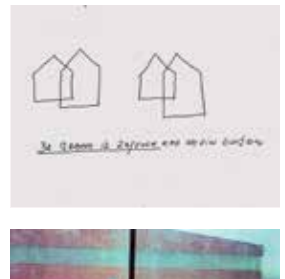

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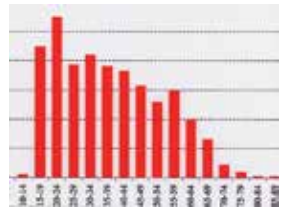






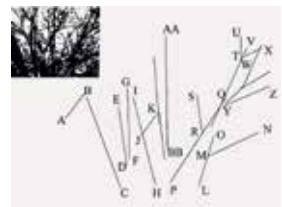





- Now I will drive you as if you
AUG 16 1994













a *material witness* when the complex histories entangled within objects are unfolded, translated, and transformed into legible formats that can be offered up for public consideration and debate. The conventions regarding which public forums are able to confer legitimacy upon the speech acts of objects and which agreed-upon standards will permit material evidence to stand up to the scrutiny of epistemological frameworks that evaluate and pass judgment upon them, needs, of course, to be continually queried and tested. Yet without this dimension of public discourse artifacts cannot fully attain the status of the witness but remain virtual, carrying their archives of encrypted data into the future as mere latent potential.

It is this public feature of witnessing, whereby materials become the objects/agents of dispute and contestation over what claims can be made or rebuked in their name that permits them to testify to the specific historical conditions out of which they emerged. The ICTY is thus a paradigmatic site or forum for conducting this research not only because it is now, effectively, a closed system whose objects have been dutifully logged and evaluated, but because its Rules of Procedure and Evidence have been scrupulously attended to and documented throughout the course of its operations.

The staggering figure of 75,868 audiovisual recordings produced during the first decade of the Tribunal's operations (1994–2005) does not include any of the AV exhibits and evidence actually procured by OTP investigators in the field. An average of two thousand exhibits are presented during the lifespan of a typical case in the ICTY, only a certain percentage of which are admitted by the judge and registrar into a proceeding as evidence. The remaining presentation materials are used as "aide-mémoires" to assist with witness testimony and are often marked by

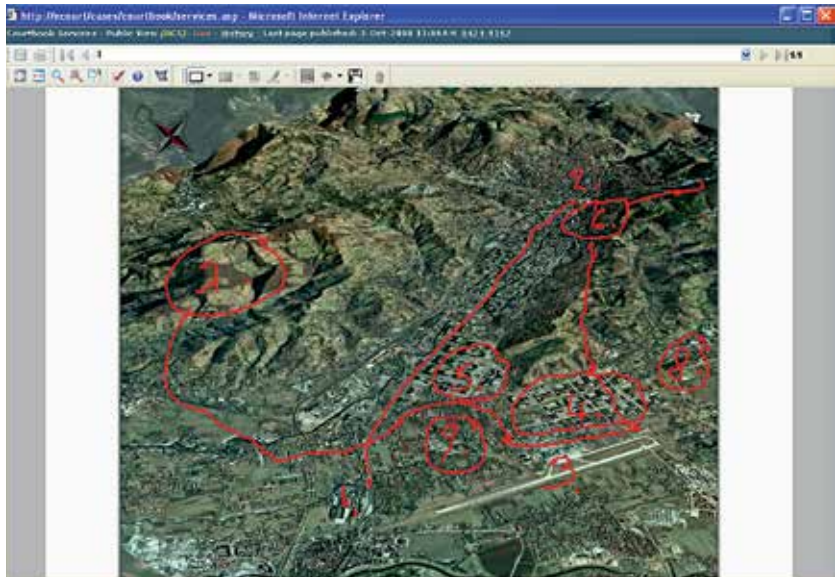


Fig. 9. IT-04-81: Perisic [TIF] Satellite photo of Sarajevo marked by the witness. Document Type: Exhibit P00001 • Date: 03/10/2008 • By: Prosecution. This e-court image precedes the photograph, which was entered into evidence one year later. Source: ICTY Court Records.

witnesses using a red digital stylus. The following, almost farcical, exchange around just such a process highlights the degree to which technologies, both their shortcomings and advantages, have come to play a determinant role in the rhythm and production of legal content. An entanglement in this particular case between the technologies of the map, screen, pen, chair, microphone, and body, each of which intervenes in the smooth functioning of the law and exposes its fundamental machinic nature. Law is not so much written as it is machined in the ICTY through the prosthetic enhancements of witnessing by technological means.

MR. SAXON: Thank you, Your Honour. We're waiting for the image to come up in e-court.
JUDGE MOLOTO: You want the image to come up here. I'm advised that the court officer is having difficulty with this thing. Is it possible to use hard copies until the technician has sorted out the problem? And does the witness have a hard copy before him at this time?
MR. SAXON: Not at the moment, but we'll give him one, with the assistance of the usher, right now, Your Honour.
JUDGE MOLOTO: Thank you very much.

MR. SAXON: So, Mr. van Lynden, you should have a satellite image of the city of Sarajevo in front of you. Do you recognise it?
A. Yes, I do.
Q. Okay. And for the — for the orientation of the Judges, first of all, we see the city elongated in this valley floor and we see what appears to be a road running through the centre of the city. Do you see that?
A. Yes.
Q. Can you tell us what that road is, or was?
A. The main road through Sarajevo.
MR. SAXON: I'm wondering, with the usher's assistance, could Mr. van Lynden's map be placed on the ELMO, and then he could view it on the monitor.
Q. Do you see this same map now on the screen in front of you, Mr. van Lynden?
A. I do.

Q. Mr. van Lynden, on the monitor to your right, there is a pen attached to it. Maybe with the usher's assistance, there's a marker, could you —
MR. SAXON: One moment, please, Your Honour.
JUDGE MOLOTO: You have a moment.

MR. SAXON: If a pen or a marker could be given to —
THE WITNESS: There is a pen here.

MR. SAXON: But we may need some better pens. I know this may be uncomfortable, but I'm going to ask you to lean over a little bit towards that ELMO, and perhaps if you could draw a line up that main street. [Marks]

Q. And if you could stop right there and just place a number 1 by that green line to indicate that street. [Marks]

Q. At the other end of the street where you stopped the green line […] — do you recall the name of that part of Sarajevo, Mr. van Lynden?
A. It was called Stari Grad, the old city.
Q. Okay. And could you place a 2, then, besides Stari Grad. [Marks]

JUDGE MOLOTO: Is there a way we can make Mr. van Lynden's life a little more comfortable?
THE WITNESS: It's okay, Your Honour.
MR. GUY-SMITH: I'll give you a chair.
JUDGE MOLOTO: If we can give you a second chair.

MR. SAXON: Perhaps if the microphone could be pushed a little bit more towards Mr. van Lynden's left.
MR. GUY-SMITH: You can switch between the chairs. That works for me.
MR. SAXON: Mr. van Lynden, do you see —

JUDGE MOLOTO: I'm sorry, Mr. Saxon, to interrupt you once again. We are now being advised that we can work from e-court.
MR. SAXON: Very well, Your Honours.
THE WITNESS: Shall I switch back?
JUDGE MOLOTO: We will come back to e-court, Mr. van Lynden, and you will be more comfortable.
THE WITNESS: If you could explain what e-court is.

JUDGE MOLOTO: You'll see it now on the monitor and you can write on the monitor itself.

THE WITNESS: On here?

JUDGE MOLOTO: Yes. But they will give you a special pen for that. Does Mr. van Lynden have a pen for the monitor? Excellent.[20]

When bodies and technologies come together they form what Deleuze and Guattari call a "machinic assemblage" in which the functional equilibrium of a set of relations gives way to processes of change, so much so that it deterritorializes matter (bodies and entities) into new categories of assembly.[21] The unfolding of many legal cases in the ICTY express, perhaps one should say with caution given that I am writing from the perspective of a media scholar rather than that of a legal practitioner, the same machinic conditions. When the functional operations of the law are interrupted by a technological glitch such as the failure of the e-court system, the lack of a pen, the contortion of a body as it tries to reach a screen without a chair, the distance between mouth and microphone, they open up a line of flight that takes the proceedings somewhere other than intended—deterritorializing the legal process and creating a new assemblage. Legal-media scholar Cornelia Vismann has referred to the court as a "translation machine" in the way it remediates heterogeneous discourses into the form of legal evidence.[22] Yet in contrast to a regular court trial, which achieves this task in part through the high value it attaches to silence (the minimization of background noise), the international tribunal involves such an apparatus of technical machinery for interpretation and recording that "language gaps" (*Sprachbrüche*), distortions, and omissions are inevitable: testimony and evidence are not only translated but *transmuted.* Examining the use of a telephonic interpretation system for simultaneous translation at the Nuremberg Trials, she argues that what at first may appear to be "a mere tool for the resolution of language problems" in fact reveals "a fundamental disorder within the translational machinery called justice."[23] The technical requirements for operating such a system, and the burden placed on interpreters by these noisy conditions, not only invert the hierarchy of the court by supplanting the discursive priority of the judge, but allow for the deliberate, unconscious, or accidental concealment of certain facets of the evidence, and the overemphasis or production of others.

Despite these breaks in the smooth functioning of the law, over time, the legal proceeding regains its control over events—the e-court system whirs back to life, a chair is located for the witness—and a state of functional equilibrium is achieved again. This newfound stability is, however, one that must now also fold the technical infrastructure and machinations of the courtroom into the performance and writing of the law. In contrast to the Nuremberg Trials, whose transcripts, as Vismann notes, were "sanitized" of all linguistic confusion and background noise in the production of "clean" manuscripts for posterity,[24] in the ICTY proceedings, glitches, interruptions, and adaptations, including the act of the witness writing denoted by the additional parenthesis "[Marks]" are recorded verbatim into the court record and become part of the official legal transcript. As judge, jurist, and witness adjust to this novel state of affairs they are reterritorialized into a new machinic assemblage altogether different than the one they were participants in before the breakdown in proceedings occurred. There are also many instances when a video, map, photo, or diagram presented in court as an inducement to witness-recall was at a certain crucial juncture in the trial transformed into a legal proof, at which point it was assigned an exhibit number by the registrar and admitted into evidence by the judge. So while all materials presented in court do not enter with the de facto legal status of "evidence," some may attain this through the debates that are activated by the artifact in question.



Fig. 10. IT-02-54: Milošević [WMV] Videotape of Izbica Massacre (extracts). Document Type: Exhibit P308A • Date: 03/09/2002 • By: Prosecution. Source: ICTY Court Records.

Q. Now, Mr. Loshi, moving on to another subject. You state in your — in your evidence, in your written evidence, that a month later after filming the — this — these sites you left Izbica and Kosovo and headed to Albania to try to distribute the tape. Did you later return to Kosovo after the war?
A. Yes, I did. I returned to Kosovo after NATO got in. I was there by 22nd of June and went to Izbica. And now I had my own camera. […] So I used it to tape — to tape that burial site which was — which was with no graves anymore. There were no bodies, no graves. Everything was flattened.

Q. What do you mean there were no graves? […]
A. I just heard rumours. Like they were taken — somebody said they were taken again in two directions. Somebody said they were taken in the direction of Klina, which is on the right side when you go to Turiqevc, and somebody else told me that later on they were found in Mitrovica somewhere. But this information wasn't clear to me, so I don't know much about this.

Q. Okay. Very well. Thank you very much.

MS. KRAVETZ: Your Honour, these are all my questions for this witness. I would like to tender this witness — the video that this witness has been referring to which is Exhibit P232. There are also a set of photographs which are still photos from the same video which are referred to in his statement dated 23rd to 25th September 2002 — 2001, and these are Exhibits P230 and 231.

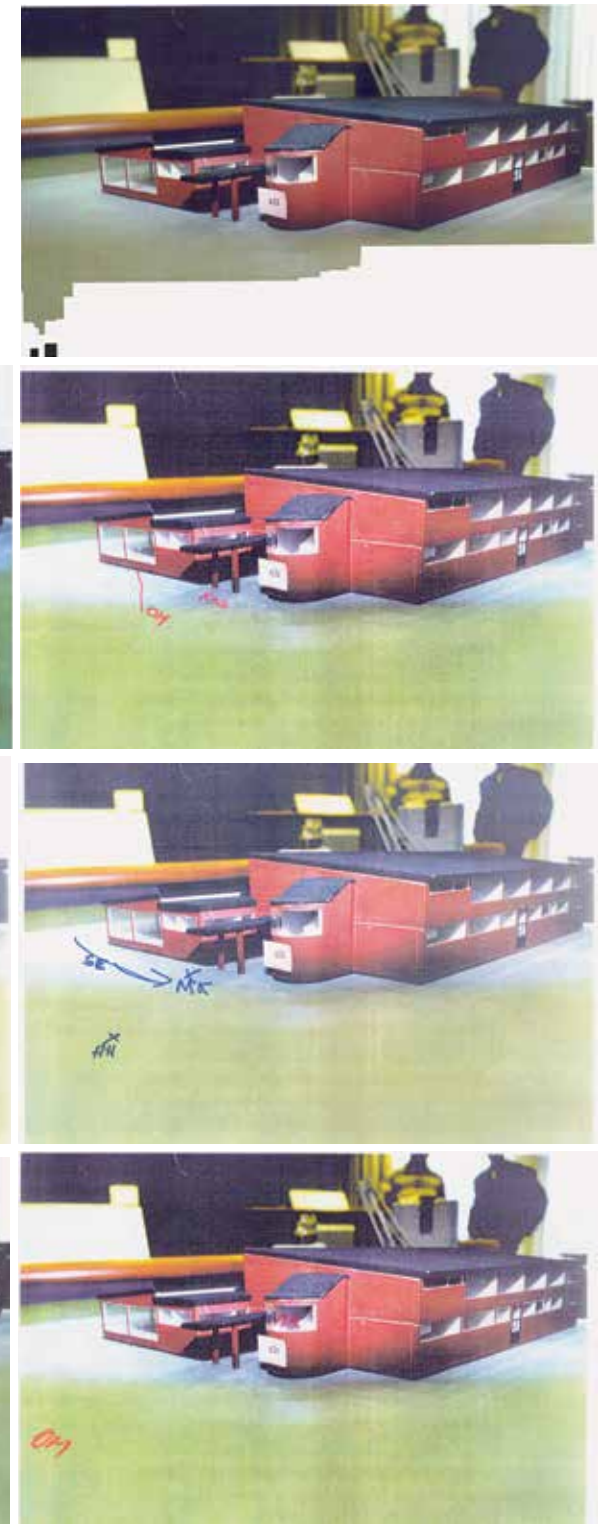
JUDGE BONOMY: Well, these will be admitted. The other film that's just been referred to taken after the 22nd of June isn't an exhibit, I don't think?

MS. KRAVETZ: I don't think that's an exhibit in this case.

THE WITNESS: Your Honour, I never brought the tape here because I was never asked for that. But if the Prosecution needs that, I would provide them with it, if they need it as an evidence.[25]

While the vast majority (99 percent) of ICTY court records consist of paper documents followed in number by maps and then photographs, even physical objects are documented and presented as visuals on screen. Many times these too are duplicated and reused in different cases. "Judges will accept copies in place of originals; if originals have been introduced, judges may decide that a copy can be substituted in the case file and the original returned to the evidence control office."[26] Multiple versions of the same piece of evidence—a photograph of the scale model of the Omarska camp, for example—had been presented during multiple proceedings. Oftentimes the

Figs. 11–17. Photographs or photocopies of the model of the Omarska camp including images marked by witnesses, 2000. Source: ICTY Court Records.



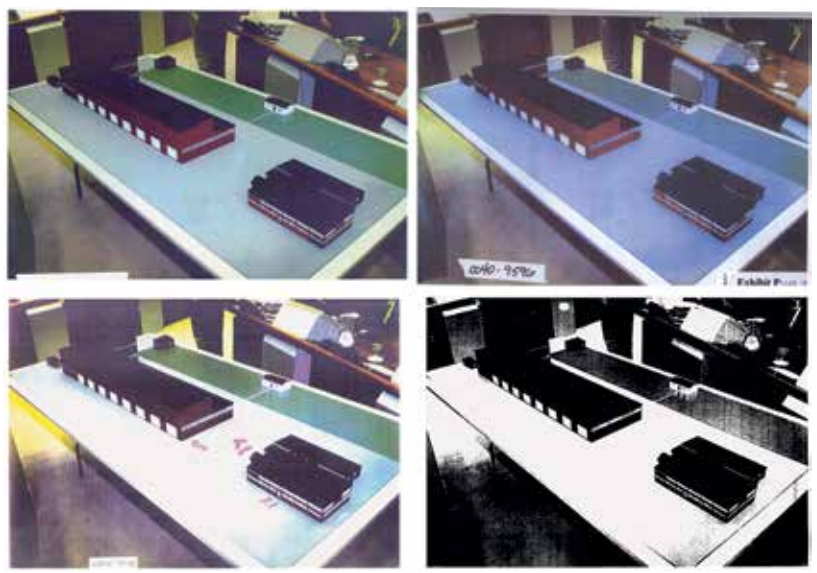
color photograph reappeared as a photocopied duplicate, which substantially degraded its image quality. This duplicate might then re-appear copied again but this time in B&W, or labeled, cropped, and/or marked by witnesses.

S. SCHUPPLI I'm interested in the relationship between the original document, which as you say would never or rarely leave the vaults, and these kinds of reproductions.

B. REID The witness will mark a copy of the original on the computer, it might for example be a military map with the front lines or it may be a photograph, or a map, and the witness will say I was captured here and he would mark A, then they took me to here, and they would mark, B, and then eventually I saw the murders at C, and they would mark it on the map. And then [this marked up map or photograph] is tendered, and that's it. When prosecution or the defense are finished with that particular aspect—the drawing, the map, the photograph, whatever it is—they then tender it into evidence but it can be objected against and then the Judges rule.

S. SCHUPPLI The object that is marked by the witness has the capacity to enter into evidence, but the original may not have been entered into evidence?

B. REID No, the original would have gone into evidence, but it would have been a copy—a computer copy, a digital copy of it. I mean we do have originals that are marked. But that's very, very rare. Everything we do now is done in the courtroom and its done digitally.



Figs. 18–21. Photographs or photocopies of the model of the Omarska Camp including images marked by witnesses, 2000. Source: ICTY Court Records.

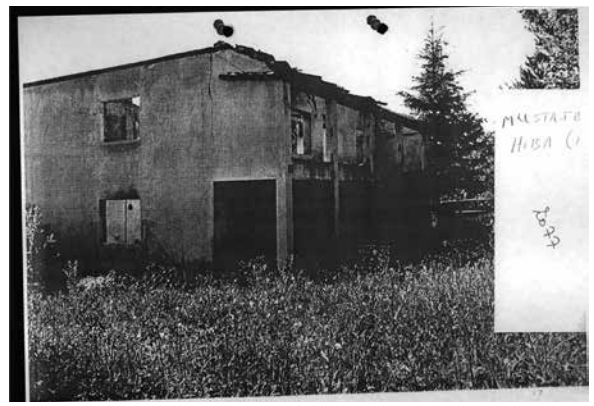
The same image might also reappear as a digital screen capture, with the ICTY desktop and Microsoft Internet Explorer window prominently incorporated into the image as its extended material substrate. Images can also reappear as a photocopy printed directly from a binder or photo album with its punch holes still visible.

These telltale signs of reprocessing alert us the degree to which materials are made to circulate within the image-economy of the court to both support and refute witness statements and expert opinions. Donna Haraway contends that "redistributing the narrative field by telling another version of a crucial myth is a major process in crafting new meanings. One version never replaces another, but the whole field is rearranged in interrelation among all the versions in tension with each other."[27] Bringing a certain forensic attention to bear upon these court records enables me to read these visible traces as a sedimented history in which all previous versions of events are encrypted and can hypothetically be made to speak. When materials, including digital files, are subject to external processes that bring about their structural reordering, they produce what philosopher of science Isabelle Stengers has called an "informed material," in the sense that they become progressively enriched by information.[28] The notion of informed materiality, which I relied upon to develop the concept of the material witness, is particularly useful for decoding the transformations that take place as materials make their way through the elaborate mechanisms of a war-crimes tribunal, from their acquisition in the field by an investigator, their accession into the registry, digital processing and uploading to e-court, through to their pre-trial disclosure by the prosecutor, and eventual presentation before the trial chamber, from whence an object or image might emerge as bona fide evidence and be assigned an exhibit number. The singularity of an event, writes Miriam Fraser, is based not simply on the fact that certain things come together, but on their coming together in a particular way. The question as to whether an entity —a legal artifact—is merely an aide-mémoire or whether it is evidence is thus displaced in favor of the question: What can it do?[29] Rendering visible the protocols and partisan practices that must come together in highly particular ways to produce the event of legal judgment sheds light on the circumstances whereby a conditional public truth might be made to appear out of the machinic assembly that is the ICTY.

Fig. 22. (above) IT-95-14/2: Kordic and Cerkez [PPT]. Behrici Photo Album (English, 3 Pages). Document Type: Exhibit 1663 • Date: 1999 • By: Prosecution. Source: ICTY Court Records.

Fig. 23. (below) IT-95-14/2: Kordic and Cerkez [PPT]. Set of 54 photographs of destroyed buildings in Han Ploca. Document Type: Exhibit 1837 • Date: 1999 • By: Prosecution. Source: ICTY Court Records.





Charles Heller (a contributor to this volume) explores what he calls "fractured chains-of-custody," denoting situations in which images move seemingly untethered between different contexts to reappear in sometimes radically oppositional discourses. As he tracks the movement of a particular image—that of boats set on fire and documented by the Moroccan military after the migrants that had built them were captured while trying to flee—he notes how each context adapted and transformed the image and in so doing "redistributed" its narrative field. Minute changes to the image are revealed through the operations of cropping and misaligned scanning that reveal, in turn, a new (image) border condition. These processes divulge important clues that enable us to trace the image-migration and investigate the multiple versions of events out of which each image emerged.[30] The situation in the ICTY is somewhat different to that explored by Heller, in that each artifact (with the exception of those posted to the office of the OTP by members of the public) must enter the legal archive through their strict compliance with chain-of-custody requirements. However once they are permitted entry, their distribution across legal proceedings enacts a similar kind of informatic overlay that can likewise be decoded.

When the Tribunal began, Bob Reid, who was then an investigations team leader, was dispatched to Bosnia to oversee the seizure, bagging, and logging of evidence, including biohazardous objects such as bloody clothing, ligatures, and blindfolds. When I questioned him about whether any issues had ever arisen pertaining to uncertain audit trails of evidence gathered during the chaos of an ongoing war, he told me it was rare. In the early days of the Tribunal he personally oversaw trucks being loaded with material evidence from Prijedor, escorted via the British military to the Bosnian border from where it was taken to the Zagreb field office. There the evidence was sealed overnight, photographed, put back into the trucks the following day and transported overland to The Hague.

Conceptualizing all recoded material as informationally enriched troubles a certain distinction between the analogue and the digital, whereby information is generally regarded as belonging to the purview of immaterial data, whereas properties are what define physical matter. ICTY protocols regarding the chain-of-custody of digital evidence remarkably collapse this distinction. While conducting my research, I was rather surprised to find that DVDs containing videos or CDs with images, PowerPoint presentations, and audio files were always photographed or photocopied in their plastic casing and labeled with their appropriate case file numbers. Even the machines required to send and receive audio signals, such as radio transmitters, were photographed and labeled. The transit of any digitally derived evidence through the operations of the court and the substrates upon which such information is stored, be it a polymer disc or magnetic hard drive, requires that it be treated as a discrete physical object (a practice that was also enshrined in my training course in forensic photography for human rights investigators with Stefan Schmitt). From its initial seizure to its subsequent transfer, analysis, and disposition, continuity between the material inscription of data and its content must be rigorously maintained for evidence to achieve its legal standing as "evidence" in court. However it is not enough to treat data simply as an analogue object, it must also be transformed into an image that can provide an audit trail of this inextricable bond: visual evidence of the physical existence, condition, and labeling of the disc or hard drive as it changes hands throughout a trial.

During the proceedings of the Tribunal it was not uncommon for upwards of seven different versions of a single piece of evidence to move through various case files, each logged by the registrar and given a unique exhibit or identifying number. Cases themselves are often nested within the court records when multiple accused are tried for the same crimes and thus evidentiary materials and exhibits must move between them. Tracking these materials as they journey through different cases and are translated into different media formats and carried by different technologies became one of my primary methodological tasks. This was a forensics, if you will, of the transit of documents through the legal-media apparatus of the court that enabled me to observe the extent to which such materials carry the imprint of these processes in their very DNA, as visuals recombine with duplicating machines to evolve a new order of legal-image hybrid.

Fig. 24. IT-04-74: Prlic and Others [TIF] Annex I (CD) to Slobodan Praljak's motion for the admission of Franjo Lozic's statement, the Bosnian Muslim press conference transcript, and associated Ministry of Justice Netherlands Forensic Institute documents. Document Type: Motions • Date: 20/04/2010 • Defense counsel. Source: ICTY Court Records.

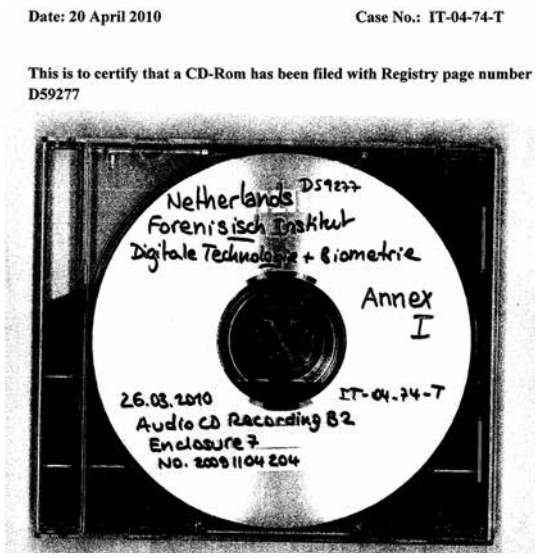


Fig. 25. IT-05-88: Popvic et al. [TIF] Picture 01925 Photograph of reel-to-reel tape recorder marked by witness PW-130 (English). Document Type: Exhibit PIC00056 • Date 07/12/2006 • By Prosecution. Source: ICTY Court Records.



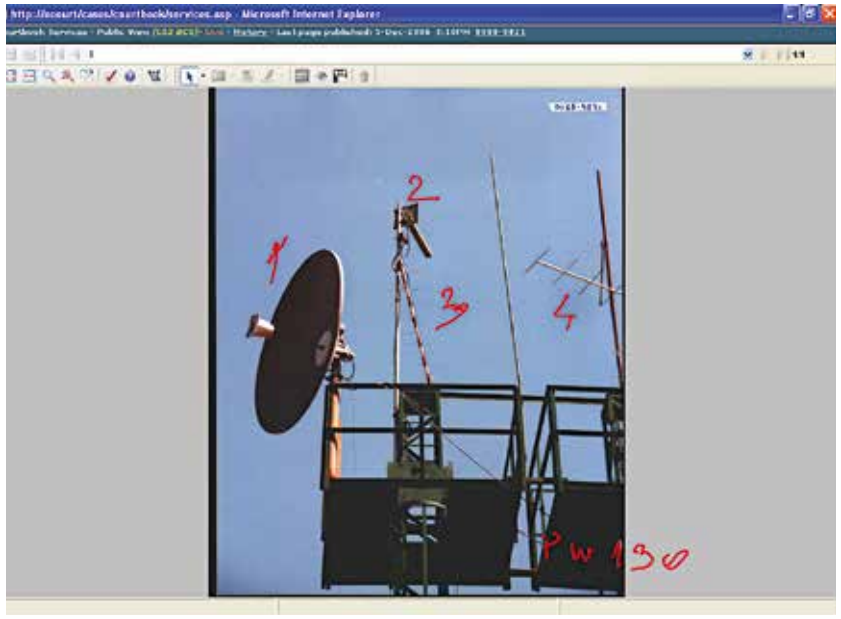


Fig. 26. IT-05-88: Popvic et al. [TIF] Pictures 02298 Photograph of an antennae marked by witness PW-130 (English). Document Type: Exhibit PIC00055 • Date 07/12/2006 • By Prosecution. Source: ICTY Court Records.

Because of the relatively low number of videotapes and visual images of other physical objects, such as scale models and machines, I have managed to review the majority if not all of these holdings within the publicly available court records of the ICTY—provided that the search-term parameters remained relatively consistent. Keyword searches such as video, videotape[s], film[s], movie[s] are used to source materials that fall within the same general category. Mislabeling and misidentification is unavoidable when managing such vast archival holdings—as the screen grab of the radio transmitter shown above clearly indicates. Though labeled as "Photograph of a reel-to-reel tape recorder marked by witness," it is obviously a radio and was discussed as such in court by the witness, who marked the functioning of the machine with respect to a series of radio transmissions that were intercepted and recorded onto audiotapes (probably accounting for the erroneous label) that are now held in the vault of the OTP. The same witness also marked the antennas that were required to send, receive, and intercept the radio signals. These are the only two examples of transmission antennae in the court records. One might typically expect photographic evidence to carry representational information about an event that can be easily decoded, for example a photograph of the weapon that was used to kill someone. In this case the evidence—satellite radio antennae—was the means by which instructions to kill were communicated. Both the erroneously labeled radio transmitter and the antennae were carriers of information that led to a series of war-crimes, but were not directly implicated in carrying out the violence per se. What these images "marked by witness" highlight is the degree to which the technical infrastructure of conflict has entered into legal discourse on par with other more incriminatory evidential forms of wrongdoing. A discussion between the



Fig. 27. IT-06-90: Gotovina et Al. [WMV] Video clip comparing two OTP videos, dated 04 August 1995. Document Type: Exhibit D00013 • Date: 08/04/2008 • By: Defense counsel. Source: ICTY Court Records.

judge and defense counsel ensues in which the recording of a radio intercept onto audiotape and status of the original copy of the audio is disputed.

MR. ZIVANOVIC: [Interpretation] I also have an objection, Your Honour, linked to the documents submitted by the Prosecution. Of course, in addition to the general remarks that have already been heard in the proceedings and about which the Trial Chamber will rule, I would like in particular to indicate that I oppose to the admission of Prosecution numbers 1395E and 1395F. This is an intercepted conversation dated the 2nd of August, 1995 at 1300 hours. And on the list, it is indicated that it is an audio tape. We did not hear the audio tape here. We heard a CD or a DVD, I don't know exactly which.

Secondly, it is not indicated here that it is a copy, and it is not indicated what the source was, what the original from which the copy was made. So I think an erroneous decision could create an erroneous impression that we are admitting an original audio tape. Furthermore, when an original audio tape has not been produced in open court, and also in view of the fact that the other party has it and has listened to it together with the witness as the witness has confirmed in the proceedings, I think that the admission of such evidence would be undermining the integrity of these proceedings, because what this Chamber should know, they should know exactly whether this is the original and whether the copy that is being tendered corresponds to the original, especially in a situation when someone is challenging it.

JUDGE AGIUS: […] We will take it as a submission made which will be considered later when we weigh the pros and cons or the plus and minuses in admitting this document or not admitting it. Yes, Mr. Nicholls.

MR. NICHOLLS: That's right, Your Honour. I think that's fine. There are just a few of these audio intercepts that we have and we can deal with that. I would just point out that the witness authenticated the recording that we heard in court, that it was the same and it was the one that he had heard on August 2nd and transcribed.

JUDGE AGIUS: All right. Incidentally, Mr. Zivanovic, you don't seem to have asked the — or expect or demand from the Prosecution the production of the original audio, do you? We had an indication from Mr. — I don't know who, I think Mr. McCloskey, two days ago that the original is in the vault, so it is available. I understand it was made clear. I don't interpret your objection as amounting to a request that the Prosecution bring forward this original audio. I didn't understand you that way any way. I understood you as objecting to the tendering of what we have here, what the Prosecution is seeking to tender. Yes.

MR. ZIVANOVIC: [Interpretation] Correct. I made an objection here, among other things, to the admission of what the Prosecutor has tendered. However, even back then, I wanted clarification, and when the Prosecutor offered to show me the tape in the Office of the Prosecutor, I understood you to say then that that can be done only in this courtroom. If the Court — if the tape needs to be heard at all. And I relied on that. I think that was perfectly appropriate, and I have no interest in listening to the tape on my own. My interest is in having the tape heard in the courtroom.[31]

The following excerpt offers another another instance in which the integrity of an audio recording and the witness who testified on its behalf were called into question. This time it is the audio track of a video that is up for dispute, as two versions of the same video presented on consecutive days in court reveal two different audio tracks: one is populated by the sound of sirens and the other by that of birds, although the image track remains consistent. Reading through the full court transcript reveals that the source of the audio tampering and the stage at which it occurred were never found out; but the incident constitutes a rather unique example of contested evidence. While there are many examples, as I have already noted, in which materials are clearly transformed through processes of digitization and duplication, these subtle and sometimes not so subtle material alterations generally did not appear to perturb or hinder the legal process. Rarely did I encounter instances of doubt being cast onto the materials themselves, with their authenticity and integrity called into question: while the aggregate impurities of the materials that I have, in effect, cross-examined, emerge as a key resource for generating new insights into the event of evidence, these perturbations seem to go largely unexamined by the court. Perhaps because such procedures are deemed to be without intent to obfuscate or hinder the operations of the law, the alterations that accrue when exhibits (especially media materials) are repeatedly copied, translated, uploaded, and so on, are regarded as a mere by-products of an otherwise essential activity. In short, my interests and those of the court are not in the least congruent. Where the court sees nothing amiss or at least nothing worth laboring over, from a perspective attuned to the micro-events encrypted within such legal materials, a whole new world begins to appear. As Walter Benjamin writes, it may be possible to "assemble the large-scale constructions out of the smallest and most precisely cut components. Indeed, to discover in the analysis of the small individual moment the crystal of the total event."[32]

Q. Between the time you received the video, approximately a year after you arrived in Belgrade, until your appearance in court yesterday, do you know of any changes to the audio or video that was shown in court?
A. As far as I know, no changes were made. You can find the same footage elsewhere as well. This is just one copy of it. I suppose there must be dozens or hundreds of it floating around. […]

Q. Are you aware that the Office of the Prosecutor has the unedited video that was originally shot on the 4th of August?
A. I'm not aware of that.
Q. Are you aware that the audio from the original video has been distorted in the video that you presented in court yesterday?

A. I'm not aware of that either.

Q. Let me show you a comparison of the original video that was produced to the Defense by the Office of the Prosecutor versus the video you presented in court. You will recall the scene of women and children running across the street under an air raid siren, and I'll let you compare the one video that was produced by the Prosecution to the Defense and then the video you presented in court yesterday.

JUDGE ORIE: Mr. Misetic, you have referred several times to the audio as well. The audio is not in evidence, at least is not being ignored by the Chamber.

MR. MISETIC: I'm not talking about the voiceover. I'm talking about the actual sound what was happening in Knin, and I believe, Your Honour, you did indicate that you were able to —
JUDGE ORIE: Yes, indeed, the sound of the shelling.
MR. MISETIC: Correct. Correct. [Videotape played] […]

JUDGE ORIE: I do understand. I do understand that we saw partof what we saw yesterday, and we saw a different version of the same picture but different sound.
MR. MISETIC: Correct.
JUDGE ORIE: Now, you'd like to have this in evidence, I take it? […]

Q. Witness, do you know who added the siren to the video you played yesterday? […]

A. I don't think I can tell. I suppose the original tape that I handed over for a copy to be made should be the copy that arrived here,in addition to which I think the original tape must still be available. I could have it sent to you personally, if that means anything, so that you can cross-reference it to your tapes. It was Veritas, was it not? I think not, because the only thing they had to do was make a copy of that tape. I don't think they actually had the equipment to introduce any new editing moves or to change the original footing.

JUDGE ORIE: It appears that the witness has no knowledge on what has been done, so let's stop speculating. Please proceed.[33]

Part III: The Tape

> All credibility, all good conscience, all evidence of truth come only from the senses.
> —Friedrich Nietzsche[34]

On a hazy morning in October 2013, Steffen Krämer, Srdjan Hercigonja, and I made our way to Izbica, the tiny rural village a two-hour drive to the south of Pristina, Kosovo, where Liri Loshi had shot his incriminatory video documenting the aftermath of the Izbica and Padalishte massacres of 1999, in which more than 120 Kosovar Albanians had been brutally murdered. The video and his testimony were debated within the war-crimes prosecutions of both Milošević and Milutinović. With satellite images and Google Earth screen-grabs to guide us we eventually found the unmarked road that would lead us back to this tragic site of ethnic violence. It was a sobering journey, generated in part by a conviction that making contact with the site and its remaining residents might somehow begin to supplement an event that the legal protocols of the court had, I felt at the time, systematically disarticulated and thus evacuated of all affect. As the residual haze that clung to the rolling hills slowly lifted, the landscape became all the more remarkable, not for the horrific past that one might imagine it would still manage to disclose, but for it's apparent absence. A farmer ploughed his field with an aging tractor and a dog growled at slow moving cattle. There was little to see as we approached the meadow.

This experience of returning to a site of extreme trauma and violence to be confronted by a lack of visible proof that something horrible happened is a common enough experience, one that is often the result of a simple need for life to return to "normal." If history is to be invoked it generally comes in the form of memorials and cemeteries—markers that designate the official



Fig. 28. Video shot at the site of the Izbica massacre in Kosovo, October 7, 2013. Still from Susan Schuppli (dir.) and Steffen Krämer (cinematographer), *Material Witness* (UK, 2014).

geographies of loss. In a recent conversation I had with documentary filmmaker Philip Scheffner about his film *Revision* (2012) made with Merle Kröger, we spoke about the paradox of being in a location where violent events had happened and yet not being able to discern evidence of that history regardless of how recently the event in question had taken place. He insisted that there is always something to see or to intuit if we look with sufficient intensity and are fully aware of what it is we are actually looking at or for. The seeing that we both had in mind was not an encounter with a concrete reality that would readily disclose its violent history through visible proofs such as a bullet-scarred building, but rather a kind of Benjaminian stereoscopic or dimensional vision that could peer into the "depths of historical shadows" and discover the latency expressed by ordinary things—such as a patch of new growth in a meadow where graves had been disturbed—the significance of which might otherwise go unnoticed.

Having spent a great deal of time reviewing the video footage that Loshi shot at Izbica and Padalishte, and after pouring through the hundreds of related pages of ICTY court transcripts, I have finally come to realize that the affective remainder of the Izbica massacre has not in fact been flattened by the legal protocols that were mobilized to attend to such a horrific event, as I had earlier surmised. On the contrary, a bureaucratic excess, albeit not one resonant with emotive affect, was produced by the very elaborate recoding processes through which the material evidence was made to move and speak. The more the video was played, edited into sequential clips by the court, translated into multiple languages, rewound, fast-forwarded, stopped, and cross-examined, the more saturated or impregnated with

information it became. Two histories were now evidenced by the object: the tape as recorded and copied by Loshi and the process of legal arbitration to which the video had been submitted. Something happened to the video as it worked its way from its procurement in Albania, through its pre-trial proceedings and disclosure by the prosecutor, to its presentation before the trial chambers wherein corroborating testimonies were disputed, and its final entry into evidence as official exhibit P232. The violence captured at the scene of the crime was, to a certain degree, complemented by the tape's machinic afterlife as it was submitted to the relentless legal machinery of the court.

[Videotape played]

JUDGE BONOMY: And you say in that statement under oath: "I recorded this videotape myself on March 31st, 1999, and this original exhibit has been in my constructive possession from the time of filming until now." Now, we already know, thanks to the testimony that you gave in statement you made under oath is not true and accurate because Mr. Thaqi is the one who recorded the video. Now, is it also the case that the second part of this statement, that is to say that you had the original tape in your constructive possession at all times before delivery to the Prosecutor, that statement is not accurate and in fact is false. Isn't that correct?

A. No. This is correct, but I believe this is a misunderstanding. Because what I was — what I said there or what I was trying to explain there, and I did — I believe I did so, was that just after the taping was done by Sefedin Thaqi in — after a few days, I believe this was April 3rd or 4th, I can't remember it now, we transferred the whole filming from his tape to VHS tape, which I had it all the time in my possession. But that tape I couldn't bring with myself to Albania because I found it very dangerous to take it with myself. Later on I meant I could and I would, but I never did because I found it too dangerous. And then I was trying to get a hold of Sefedin Thaqi's tape, which I did. And this is how this Sefedin Thaqi's tape got into Tribunal and not my tape that you're referring to, which, of course, like you said, was in my possession all the time. And I believe now it's in a possession of Tribunal of The Hague as well.

Q. Now, with respect to Mr. Thaqi's tape, am I correct that this tape was at one point in time stolen by some thieves?

A. Yes. At the time where I was looking for this tape, his own camera was stolen, I believe not because of the tape but because — the tape was stolen because of camera. The thieves didn't even know what was in. And then with the help of Shaban Dragaj I get a hold of this tape again.[35]

Within a juridical context the material witness is a person who is deemed to have information germane to the subject matter of a lawsuit or criminal prosecution that is significant enough to affect the outcome of the trial. In other words, the witness, by means of the information they may possess, is considered sufficiently "pertinent" to the legal proceedings that every effort must be made to procure their testimony. Humans become witnesses when their knowledge or experience positions them as semantically "material" to a case. However, the mere fact that materials capture and archive eventful processes within themselves or harbor information as metadata does not convert such entities into de facto material witnesses capable of testifying before the tribunals of history. All matter registers evidence of certain histories, but not all materials become evidential in the sense of disclosing or bearing witness to these historical processes. Emphasizing the classical distinction between legal evidence, as that which belongs to the domain of the technical archive, and testimony, understood as a sworn pledge (made by a person) to tell the truth, Jacques Derrida has argued that "to be a witness consists in seeing, in hearing, etc., but to bear witness is always to speak, to engage in and uphold, to sign a discourse. It is not possible to bear witness without a discourse."[36] What Derrida shows, however, is that this (legal) discourse is already to some degree technical by the very nature of the iterative protocols that organize the taking of the oath. The appeal to technics that he identifies within the structurally performative dimension of entering the law as a witness—I swear to tell the truth, the whole truth, and nothing but the truth—exposes the degree to which it becomes difficult to differentiate between a conception of material evidence and pure testimony, with this difficulty turning exclusively on the question of technology. This ambiguity is at the heart of a discussion around the amateur video footage shot by Loshi in the aftermath of the massacres at Izbica and Padalishte.

Appearing initially as erratic magnetic interference, the damaged materiality of exhibit P232 eventually migrates into the image-field as the mute horror of dead bodies slowly coalesces to reveal itself to the camera/viewer. The material violations evidenced in the dense overlay of defects caused by the repeated copying and over-coding of the tape immediately alerts us to the material violations of the body proper that will soon emerge as the intended subject matter of the image. In cinema such frenzied distortion in the visual field has come to signal immanent danger and threat, as the stability of a world organized as a coherent picture falls apart and is consumed by violence, a trope that a director like Michael Haneke has relentlessly resisted in extruding violence out of his restrained and overly passive images. The flat, orderly image cleansed of animated surface noise is the most terrifying in a Haneke film and the rupture when it occurs all the more ferocious. His films *Funny Games* (1997) and *Caché* (2005) are exemplary in this
regard. The massacre video cannot, of course, be compared to the narrative



Fig. 29. Video frame-grabs from Liri Loshi's footage shot in the aftermath of the Padalishte Massacre, Kosovo, March 26, 1999. Source: ICTY Case No. IT-02-54: Milošević. Source: ICTY Court Records.

constructions of cinema given its status as documentary evidence of a crime. But the impoverished condition of the tape, with its material degradations and destabilized image-field, are disturbingly resonant with chilling affect, reminding us of the political program that sought to eradicate difference through ethnic cleansing.

Literary critic Shoshana Felman has argued that the very difficulty of producing an intelligible narrative in the face of historical trauma is that which characterizes the true act of bearing witness. Drawing upon the filmed documentation of the Eichmann trial in which a witness, Yehiel Dinoor/K-Zetnik, fainted while attempting to testify, she asks under what circumstances and in what ways the withdrawal of the legal conventions of speech can constitute a form of legal testimony in its own right.[37] When recounting his own experiences of Auschwitz, Primo Levi likens his memory traces to the machinic operations of a tape recorder, which can rewind and play back history: "I still have a visual and acoustic memory of the experience that I cannot explain. […] Sentences in languages I do not know have remained etched in my memory, like on a magnetic tape."[38] K-Zetnik's memory erased the trauma of the camp, whereas Levi's memory recorded it. In both cases the capacity to bear witness occurs not through acts of spoken testimony but through technologies of inscription: the fainting body, the mnemonic operations that rewind and play back like a tape recorder. Likewise, rather than reducing its capacity to stand convincingly before the Tribunal as a witness to a crime, the degraded quality of Loshi's videotape enhances its capacity for testimony insofar as the epistemic dimensions of an image-regime typically called upon to account for historical violence through explicative narration are refused. Instead its material defects saturate the tape with a different kind of information, producing a form of ontological reckoning that doesn't require the supplementary intervention of a human witness endowed with the task of extracting meaning from errant electrons or executed bodies. Forcing wholeness and clarity from the massacre videotape's erratic image-data would, in my mind, violate the events anew—which is exactly what happened during the cross-examination of Loshi in court. What the footage can tell us about the historic events to which it gestures as a technical witness, is matched in relevance by its struggle to meet the court's demand for coherent accounts of history.

When writing about Francis Bacon's paintings, Gilles Deleuze contends that "photographs cannot produce an intensity of sensation, or rather cannot produce differences within sensation," in that, unlike painting, they do not activate the body and provide different ways of seeing. Rather, they are merely a recording and a resemblance of what we see.[39] Painting, says Deleuze, requires the cooperation of the artist's hand, which is always in a relationship of imbalance with the eye. What the eye sees can never be registered absolutely by the hand: something different always emerges from within the depths of paint. I contend that many of the media artifacts presented during the legal proceedings of the ICTY emphatically register this imbalance at the level of the machinic. In each case, sensation emerges out of the technical reorganization of the image-event; that is to say, out of its material depths rather than out of its mimetic regime. A different strata of knowledge about these events of crisis—knowledge that arises out of processing—is impelled into presence, activating the sensorial domain of testimony at the moment that the plane of resemblance (the appearance of things) gives way to the furtive emissions of the ontological substratum. At these moments of intensified image-compression a new material witness might be said to emerge from within the depths of magnetic particles or pixels.

Q. My next question – there are only going to be two more questions, and that is going to conclude my cross-examination. So my first question has to do with the authenticity of the footage in relation to the date when it was made. Is there some compelling evidence that would prove the date when this was taken? Was it exactly June 1999? […]
A. With regard to your first question, my sentence uttered on the tape is, "We are in Izbica, 23rd of June, 1999, 1215 is the time, 15 minutes after noon." This is my opening line when the recording starts, and then I explain what I'm doing.[40]

Q. My final question, sir: You've told us, both in the statement and under cross-examination, about the actual videotapes, and you talked about differences in format and then re-recording. The first format of the original tape, I'm holding up a very small videotape. Would you look at it, please. Is that the original format of the tape which was designated as 1733, is that the format of the original tape?
A. From the format that I can see from here, I can't make it out all that clearly, but it could well be the cassette that I brought to this court.

Q. Then I'm holding up a larger, normal size videotape that is usually in use at video stores, et cetera.

Is that the size of videotape that you recorded or re-recorded what was on the smaller tape? Is that the two different sizes?
A. Which one, the small one or the big one?

Q. Now looking at a bigger one.
A. Yes. That's the size of the cassette that I used to transfer the material from the small cassette to the large one, because later I used a small cassette of the kind that you're holding in your other hand.[41]

As this book *Forensis* makes explicit throughout, the primacy of human testimony is increasingly giving way to a forensic account of events that has shifted the emphasis towards an object-oriented juridical culture immersed in matter and in code. Yet in order for a legal object to bear witness legally, given that it can't swear to tell the truth, it must move through a sequence of bureaucratic stages that address its relevant features or structurally recompose it. The visceral defects of Loshi's massacre video bear sensate and even symbolic witness to acts of palpable violence. And somewhat surprisingly (to me) its electronic degradation did not raise questions as to the credibility of Loshi himself as a material witness, in spite of the fact that under cross-examination he admitted that the camera containing the crucial Izbica tape (IT-05-87) was stolen and later recovered in Albania along with the video. Loshi's admission corroborates the damaged state of the tape, which in addition to dropout shows signs of extensive image-loss, indicating that it was likely reprocessed by incorrect video codecs when transferred. Moreover, the presence of rolling scan lines and yellow streaks suggest that at one point the video may have been copied by filming directly from a television screen. These are all factors that point towards the tape's ongoing transformation as it traveled between Kosovo, Albania, and The Hague—a situation that could introduce doubt into the legal proceedings if the tape's chain-of-custody were to become an issue. Given the extraordinary events documented by the video, and the perilous conditions under which it was made, equivocations as to its veracity were minimal.

Slobodan Milošević cross-examining Liri Loshi:

Q. Yes. We're going to look at all that very carefully, don't you worry about that. And experts will take a look at that too, never you mind. But what I would like you to tell me is how, by showing a picture of a body in a meadow, you set out to prove that death was caused by execution. And then you go a step further and say that death occurred through execution and that the execution was carried out by the Serb army and police. How do you prove that by showing the picture of a dead body, of a dead man in a meadow? […]

JUDGE MAY: I'm going to stop you. I'm going to stop you.

Fig. 30. IT-02-54: Milošević [WMV] Videotape of Izbica Massacre (extracts). Document Type: Exhibit P308A • Date: 03/09/2002 • By: Prosecution. Source: ICTY Court Records.



All this is argument. There's no point arguing with the witness. He's given his evidence. He's described what he filmed. There's no point asking him what it's supposed to prove. That's a matter which we're going to have to decide. You know this. You argue with witnesses and it's pointless.[42]

"But what I would like you to tell me is how, by showing a picture of a body in a meadow, you set out to prove that death was caused by execution?" This meta-question posed by former Yugoslav President Slobodan Milošević does not doubt the fact of the tape's existence, nor the condition of its production—chain-of-custody queries would tend to suggest there is something on the tape worth interfering with and would thus reinstate the significance of the object—his question instead casts doubt on the capacity of the image to *prove* rather than merely show that something happened. Given that the court's evidential holdings now enter the trial images almost exclusively as screen images scanned to e-court, whether buildings, soiled clothing, or bullets, the question could in many ways unravel its entire legal infrastructure, had the probative value of images been further disputed. My analysis of the ICTY Court Records is itself not concerned directly with representational matters, but with matter as captured by different forms of technology and processed by different kinds of legal apparatuses. It may be understood as a cross-examination that does not disavow the status of representation, inasmuch as it asserts the witnessing capacity of micro-material events and reveals their discursive uptake within the administrative circuits of the law. Despite the mere appearance of things, there is always something more

that can be discerned when "entering evidence," not as a jurist or archivist charged with the task of admitting materials into evidence and guarding their history against external forces, but as a researcher plunging into evidence and following its lines of flight as they cut across the legal architectures of the court.

I wish to acknowledge the research assistance of Blake Fisher and Hannah Meszaros Martin, who worked diligently alongside me in sourcing materials and reading transcripts. I also wish to thank James Burton for his insights and contributions.

1 William James, "The Will to Believe," in *An Address to the Philosophical Clubs of Yale and Brown Universities* (New World, 1896), 1–17, at 4.

2 UN ICTY, "History," http://www.icty.org/sid/95, accessed December 29, 2013

3 International Criminal Tribunal for the former Yugoslavia, Rules of Procedure and Evidence, U.N. Doc. IT/32/Rev.49 (May 22, 2013), entered into force March 14, 1994, http://www.icty.org/sid/136.

4 For a discussion of the memorial function of the ICTY archive, see Kirsten Campbell, "The Laws of Memory: The ICTY, the Archive, and Transitional Justice," *Social and Legal Studies,* vol. 22, no. 2 (2013): 247–69.

5 Ibid., 247.

6 Office of the Prosecutor, "Prosecution's Observations Regarding Export Report on the Authenticty of Videotapes IC00820 and IC00821," ed. ICTY (Trial Chamber III, The Hague: ICTY, 2010).

7 See Trudy Huskamp Peterson, "Temporary Courts, Permanent Records," ed. History and Public Policy Program (Washington, DC: Woodrow Wilson International Center for Scholars, 2008).

8 Bob Reid (ICTY Chief of Operations) in discussion with the author, August 2013.

9 See Ines Schaber, "Unfinished Business: Lewis Hine's Mine Photographs and Some Questions about Documentary Photography," seminar paper, Liminal Zones—Nicosia Seminar, Department of Architecture, University of Cyprus/Goethe Institut Nicosisa, 2008, http://liminalzones.kein.org/sites/liminalzones.kein.org/files/Unfinished_business.pdf

10 The Office of Internal Oversight Services (OIOS) conducted an audit of archives and records management at the ICTY between June 2011 and August 2011. The overall assessment was that: "ICTY governance, risk management and control processes examined were *partially satisfactory* in providing reasonable assurance regarding the management of ICTY archives and records, and preparatory arrangements to transfer these records timely to the Mechanism, concerning the internal control objectives: efficient and effective operations and compliance with mandates, regulations, and rules." OIOS, "Emergency Response & Disaster Recovery Plan: Hard-Copy Records" (2011).

11 This atrocity video surfaced following the Srebrenica genocide of 1995 and eventually made its way to the ICTY where it was authenticated and shown at the trial of Slobodan Milošević in 2005. Parts of it were presented again during Milošević's testimony in Jovica Stanisic's trial. A ripped copy of the raw VHS tape has been leaked online.

12 Peterson, "Temporary Courts, Permanent Records,"16.

13 "The Tribunal's legacy may be conceptualised broadly as 'that which the Tribunal will hand down to successors and others,' including: The factual findings on the crimes that occurred and the responsibility of the accused for those crimes. The legal legacy of the Tribunal, including its rules of procedure and evidence; practices of the Tribunal, the Office of the Prosecutor, and the Registrar; and—perhaps most significantly—its judgements and decisions, which define the legal elements of crimes that must be established beyond reasonable doubt to establish the responsibility of the accused. These judgments, decisions and practices represent a contribution to the development of substantive and procedural international humanitarian law and international criminal law. The records of the Tribunal, including audio-visual recordings of the proceedings, transcripts and the evidence admitted into its cases, and collections of material gathered in the course of investigations. Combined, this material, some of it confidential, will constitute the archive of the Tribunal's work." See Background Paper, "Assessing the Legacy of the ICTY" (paper presented at the Conference of the International Criminal Tribunal for the former Yugoslavia, The Hague, February 23–24, 2010), 1–2.

14 Paul Mason, *Report on the Impact of Cameras at the International Criminal Tribunal for the former Yugoslavia* (The Hague: ICTY, 2000).

15 Ibid., 1.

16 Peterson, "Temporary Courts, Permanent Records."

17 Bertrand Russell, *Unpopular Essays* (London: Taylor & Francis, 2009), 101.

18 Defense counsel John Ackerman in a Status Conference with Judge Bonomy. ICTY Court Transcripts, August 25, 2005, 050825SC, 82–87.

19 Susan Schuppli, *Material Witness: Forensic Media and the Production of Evidence* (London: MIT Press, forthcoming 2015).

20 ICTY Court Transcripts, October 3, 2008, 081003ED, 466–70.

21 John Johnston, "Machinic Vision," *Critical Inquiry* 26, no. 1 (1999): 27–48, at 28. Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia,* trans. Brian Massumi (London: Continuum, 1987), 88–90 and 331–37.

22 Cornelia Vismann, "Breaks in Language at the Nuremberg Trials," trans. Kerstin Schroer and Susan Schuppli (2012), available at http://www.forensic-architecture.org/wp-content/uploads/2012/06/Language-Breaks-Vismann.pdf; originally published in German as "Sprachbrüche im Nürnberger Kriegsverbrecherprozess," in *Juristischer und literarischer Diskurs in der Auseinandersetzung mit den NS-Massenverbrechen*, ed. Stephan Braese (Göttingen: Wallstein, 2004), 47–56. See also Cornelia Vismann and Geoffrey Winthrop-Young, *Files: Law and Media Technology* (Stanford: Stanford University Press, 2008); and Cornelia Vismann, "Tele-Tribunals: Anatomy of a Medium," *Grey Room*, no. 10 (Winter 2003): 5–21.

23 Vismann, "Breaks in Language," 3.

24 Ibid., 16.

25 ICTY Court Transcripts, October 26, 2006, 061026IT, 5369–71.

26 Peterson, "Temporary Courts, Permanent Records," 18.

27 Donna Haraway, "Primatology is Politics by Other Means," in *Feminist Approaches to Science,* ed. Ruth Bleir (New York: Pergamon Press, 1986), 77–118, at 85.

28 See Bernadette Bensaude-Vincent and Isabelle Stengers, *A History of Chemistry* (Harvard: Harvard University Press, 1996), 206. See also Andrew Barry, "Materialist Politics: Mettalurgy," in *Poltical Matter: Technoscience, Democracy, and Public Life*, eds. Bruce Braun and Sarah J. Whatmore (Minneapolis: University of Minnesota Press, 2010), 89-118, at 90.

29 "The singularity of an event is based not simply on the coming together of prehensions, but on their becoming together in a particular way. The question as to whether an entity—a scientific artefact or work of art for example—is 'real' or whether it is a 'representation' is thus displaced in favour of the question as to what it can do." Mariam Fraser, "Event," *Theory, Culture & Society,* vol. 23, nos. 2–3 (2006): 129–132.
30 See Charles Heller, "Fractured Chain of Custody" in the present volume.
31 ICTY Court Transcripts, , December 12, 2006, 061207IT, 5181–83.
32 Walter Benjamin, *The Arcades Project,* trans. Howard Eiland and Kevin McLaughlin (London: Belknap Press, 1999), 461.
33 ICTY Court Transcripts, April 8, 2008, 080408ED, 942–46.
34 Friedrich Nietzsche, *Beyond Good and Evil*, trans. R. J. Hollingdale (Minneapolis: Filiquarian Publishing LLC, 2006), 134.
35 ICTY Court Transcripts, October 26, 2006, 061026IT, 5390–91.
36 "Testimony has never been or should never be mistaken for evidence. Testimony in the strict sense of the term, is advanced in the first person by someone who says, 'I swear,' who pledges to tell the truth, gives his word, and asks to be taken at his word in a situation in which nothing has been proven . . . It is possible for testimony to be corroborated by evidence, but the process of evidence is absolutely heterogeneous to that of testimony." Jacques Derrida and Bernard Stiegler, *Echographies of Television: Filmed Interviews,* trans. Jennifer Bajorek (Cambridge: Polity Press, 2005), 93–94.
37 Shoshana Felman, "A Ghost in the House of Justice: Death and the Language of the Law," in *The Juridical Unconscious: Trials and Trauma in the Twentieth Century* (Cambridge, MA: Harvard University Press, 2002), 131–51.
38 Primo Levi, cited in Giorgio Agamben, *Remnants of Auschwitz: The Witness and the Archive*, trans. Daniel Heller-Roazen (New York: Zone Books, 2002), 27.
39 Gilles Deleuze, *Francis Bacon and the Logic of Sensation,* trans. Daniel W. Smith (London: Continuum, 2004): 49.
40 ICTY Court Transcripts, February 10, 2009, 090210IT, 793.
41 ICTY Court Transcripts, September 3, 2002, 020903IT, 9484–85.
42 Ibid., 9443.

The Architecture of International Justice

Francesco Sebregondi in conversation with Cesare P. R. Romano

The following interview emerged from a collaboration between Cesare P. R. Romano, professor of law at Loyola Law School, Los Angeles, founding member of the Project on International Courts and Tribunals (PICT), and pioneer of the study of international adjudication, and Francesco Sebregondi, an architect and research associate on the Forensic Architecture project. Together they produced a series of maps and visuals of the world of international courts and tribunals, first published in *The Oxford Handbook of International Adjudication* (2014) and partially reproduced in a modified format here.[1]

The goal of this mapping project is to collect and present large amounts of otherwise diffused data. While legal scholarship chiefly relies on the written word as its medium, visual representations allow a different light to be shed on the matters at stake. Three maps and a timeline serve here as the basis for a discussion focused around the architecture of international justice: its organizational logic, its territorial boundaries, and its patterns of expansion.

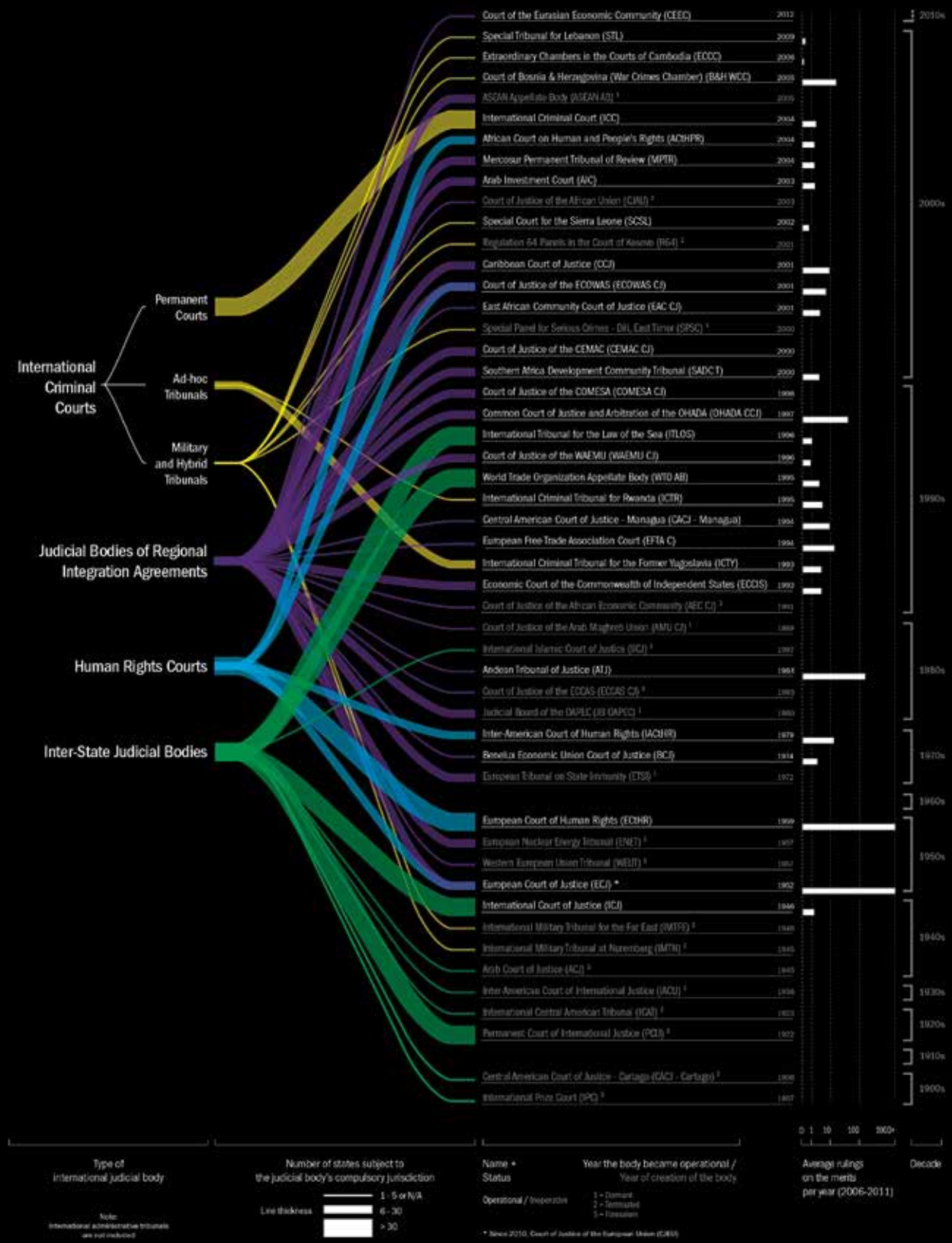
FRANCESCO SEBREGONDI I understand your approach as follows: probing the principles and aspirations of international justice vis-à-vis the reality of its material implementation today—a step that necessarily brings us into issues of politics and space. To use the words of Alex Jeffrey, our common starting point for this mapping project may have been "an understanding of international justice not as an abstract condition or outcome, but as a process that is incomplete and situated in space."[2] Would you agree with this?

CESARE ROMANO Situating international courts in their space—physical, political, ethical, and legal—is at the core of PICT's mission. When PICT was launched in 1997, international courts were largely conceived as islands in the ocean of international law with no connection with each other. There were specialists on this or that court, but there was no unifying vision of the whole. Also, courts largely operated in isolation, often reinventing the wheel and rarely talking to each other and sharing experiences. The first visual image of the field I produced, the PICT Synoptic Chart,[3] is still regarded today as groundbreaking as it attempted to bring together, in the same image, what until that point had been considered completely unrelated phenomena.

International Judicial Bodies
Taxonomic Timeline

Data
Karen J. Alter, Cesare P.R. Romano
[as of 1st July 2013]

Visualization
Francesco Sebregondi / Forensic Architecture



International Judicial Bodies
Compulsory Jurisdiction Across the Globe

Data
Karen J. Alter, Cesare P.R. Romano
[as of 1st July 2013]

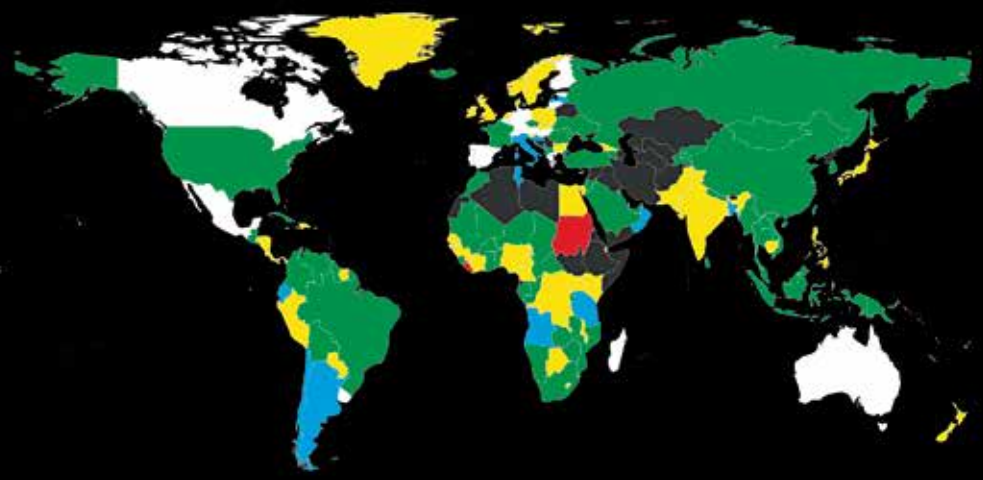
Visualization
Francesco Sebregondi / Forensic Architecture

Inter-State Judicial Bodies



States colored according to the acceptance of compulsory jurisdiction of one, two, or three international judicial bodies for inter-state disputes considered (ICJ, WTO AB, ITLOS)

States not accepting compulsory jurisdiction of any of the three bodies considered



International Criminal Court

States that have ratified the Rome Statute of the ICC

States that have not ratified the Rome Statute of the ICC

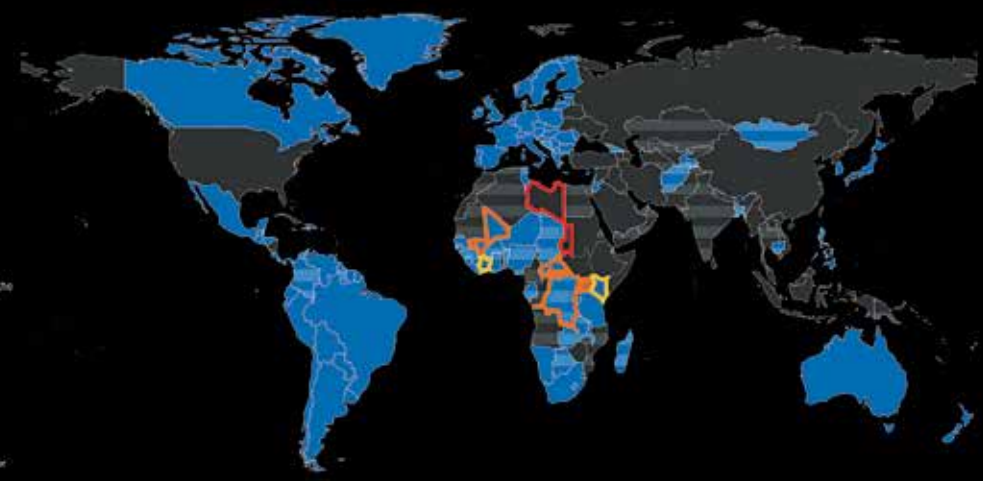
States that have ratified a Bilateral Immunity Agreement with the United States

Situations that have been formally investigated by the ICC since its creation:

Referral by ICC State Party

Referral by UN Security Council

Proprio Motu investigation by the ICC Office of the Prosecutor



Judicial Body Seat

Seat of judicial body with universal reach

Seat of judicial body with regional reach



Note:
The full names of the judicial bodies marked here by their corresponding acronym can be consulted in the Taxonomic Timeline

FS When looking at the timeline, one can clearly make out a sharp rise in the numbers of international courts since the 1990s. Could you explain some of the main factors of this increase?

CR The end of the Cold War was pivotal in opening the floodgates for the multiplication of international courts. Several factors were at play, depending on the family of international courts considered. For example, and to focus only on one kind of courts, the end of the confrontation between the two blocks made it possible for international criminal law to be resurrected, after a long hiatus since the end of World War II. Within the UN, and specifically the Security Council, agreement could be reached in 1993 to create the International Criminal Tribunal for the former Yugoslavia (ICTY). When the next year all hell broke loose in Rwanda, the Security Council replicated the ICTY model, creating the International Criminal Tribunal for Rwanda (ICTR). The ad-hoc nature of these two tribunals led many to think again about the need for a permanent international criminal court, which came into being in 1998 in the form of the International Criminal Court (ICC). The shortcomings of the ICC and the need for more localized international criminal justice led to the creation of the various hybrid criminal courts.

FS In your article "Can you hear me now? The Case for Extending the International Judicial Network," you chose to speak of an international judicial *network*, "since 'system' implies a level of coordination that does not exist yet."[4] Could you describe some of the mechanisms of coordination already in place? How do judicial power and knowledge circulate among the different bodies forming this network? By which means does the existing configuration of the network shape its extensions (here I am thinking of new courts created on the model of existing courts)? Have you identified any feedback loops by which the architecture of the network may self-adjust to, say, dysfunctional experiences or shifts in geopolitical conditions?

CR Coordination and dialogue between courts and their various users has greatly increased since the early days of PICT. When we launched the project, in February 1997, we gathered together in London the registrars (i.e. the senior legal officers) of seven international adjudicative bodies. It was the first time in history that this happened and those gentlemen had never met each other, even though they were largely doing the same work. Since then, meetings between judges and staff of international courts have become almost routine. A number of initiatives have been launched to facilitate dialogue. One of the most notable is the Brandeis Institute for International Judges, which picked up the task of helping the actors directly involved in international adjudication—international judges—learn from one another so as to address judicial, ethical, and administrative questions and improve international adjudication.

The dialogue between courts has given rise to an informal international judiciary.[5] Indeed, there is evidence that international judges have adopted, consciously or unconsciously, by design or out of necessity, a series of *modi vivendi*—informal and non-codified but no less effective—for structuring and regulating interactions between their courts, mainly with the aim of avoiding conflict of jurisdiction and of jurisprudence. In certain cases it seems they are going even further, from peaceful coexistence and mutual regard for their respective spheres of competence and jurisdiction to strategic cooperation and mutual assistance to extend their own power and authority. In sum, international courts are no longer "self-contained systems." They are gradually evolving, spontaneously and organically, if not into a "judicial system" then at least into a specific type of social network, a "judicial network," where each international court is a node. This network also extends to national courts, as the work of André Nollkaemper from the University of Amsterdam shows.[6] Indeed, it is increasingly plausible to consider national courts exercising international jurisdiction—or jurisdiction running parallel to that of international adjudicative bodies—as part of this broad universe of international adjudicatory procedures.

FS At first sight, in the maps we have produced, the current international judicial network seems to reproduce some of the spatial configurations of European colonialism: the seats of all four courts with a universal reach are situated in Western Europe, and the eight situations investigated to date by the ICC are all in Africa. We also see that some of today's most powerful states—for instance China, the United States, Russia, and India—seem very reluctant to consolidate an international judicial network, least of all its branches with universal reach. To what degree is international justice a Eurocentric adventure, and how long can we expect it to survive Europe's ongoing decline in global influence? Do you see it possibly receding in the coming years?

CR I don't think the idea of international adjudication is a Eurocentric adventure. You are correct in pointing out that all four courts with jurisdiction extending worldwide are based in Europe, but the Americas have a history of international and transnational adjudication as old as the European one. The first truly permanent international court (the Central American Court of Justice) was established in Cartagena, Costa Rica, in 1908. Nowadays, the continent that features the highest concentration of international adjudicative bodies is not Europe but Africa.

That being said, it is true that, as Benedict Kingsbury said, adjudication is a product of liberal and legalist juridical orders that are particularly associated with democracy, rule of law, open markets and information flows, basic liberal property and political rights setting limits on state powers, and some

hierarchical governance structures dominated by liberal polities and their corporate and civil society groupings.[7] A multipolar global political order, especially one where the relative power of the United States and Europe is decreasing, is already bringing about ideas about what global governance is and how law and legal institutions can and should function that are quite different from those embodied by international adjudicative bodies. In this regard, the marginal role played so far in the judicialization project by the superpowers of tomorrow (India, Russia, China, and also Brazil and South Africa), the vast Asia-Pacific region, and the Arab World is a concern.

FS How does the principle of universal jurisdiction relate to the apparatus of specifically established international courts and tribunals? And how has the implementation of this principle evolved in the past twenty years? The researchers of the Model Court group, associated with the Forensic Architecture project, have recently explored the peculiar case of the trial of François Bazaramba, a Rwandan national convicted of genocide by a small district court in the Finnish town of Porvoo.[8] In your opinion, does this case constitute a somehow marginal exception to the prevalent operational routes of international justice, or is it evidence that the principle of universal jurisdiction is still an active pole within the ongoing development of an international judicial network?

CR We should not forget that the primary responsibility to dispense justice, nationally and globally, still belongs to national courts and authorities. Indeed, as a principle of customary international law, access to international judicial remedies is always conditional upon exhaustion of domestic remedies. Direct resort to international jurisdictions is permissible only when there is no possibility for recourse in a domestic jurisdiction. Sometimes domestic courts do not exist (for example, because they have been closed down by war), are unable to dispense justice impartially, or lack jurisdiction over one of the parties (for example, the defendant is shielded by the sovereign immunity doctrine). In these cases, the individual can bypass the domestic level and directly access competent international jurisdictions, should they exist. Sometimes it is the courts of other nations that exercise jurisdictions in the name of the principle of universal jurisdiction. Regardless, we are always talking about national courts, not international ones. The supplementary nature of international courts to domestic ones is both a matter of logical and practical convenience; it ensures that claims are addressed at the lowest possible level of complexity, and it is a corollary of the principle of sovereignty, which is the ordering principle of the international community.

FS This sounds right in principle, but a case like that of Bazaramba seems to go against any logical and practical convenience. Is a national court in Finland *closer* to a case situated in Rwanda than an international court such as the ICTR, located in Arusha, just because it belongs to the national/domestic level? Is it able to address it at the lowest level of complexity, while located seven thousand kilometers to the north, and having to mediate its hearings with videoconferencing technology? While this specific case might well be an oddity, it raises an important question which concerns not only national courts exercising universal jurisdiction but also every international court with universal reach: the question of *distance*. I had the chance to meet with Julien Seroussi, assistant to Judge Bruno Cotte in the ICC Trial Chamber II during the Katanga/Ngudjolo Chui case,[9] and he described the immense obstacles brought about in the legal proceedings by the cultural distance between the witnesses and the court: for example, what first appeared to the court as inconsistencies regarding dates and locations in several testimonies were later understood to be the result of a culturally different relation to time and place in this region of the world—nonetheless leaving the court with the difficult task of bridging the gap. How is distance—geographic, cultural, social—understood as a limit condition within international adjudication? When does the imperative of dispensing justice for crimes that today have a universal status collide with the impossibility of a court *hearing* stories told from too far away?

CR I agree with you that a Finnish court adjudicating crimes committed by a Rwandan in Rwanda against Rwandans sounds like a paradox. In a perfect world Bazaramba would have been tried in Rwanda. However, international courts can try only so many cases. They have limited resources. In general, they are created only for the most serious crimes, those committed by the military and political leadership. To the extent that there is a conflict between the imperative of dispensing justice for international crimes and the objective difficulty domestic courts might have in adjudicating on acts committed too far away, I believe it is better to have justice done somewhere, albeit imperfectly, than not having justice done anywhere, as it used to be until the recent past.

FS As you and others have noted, the case of Rwanda also reveals a remarkable paradox: "the high-level organizers of the Rwandan genocide over whom the ICTR has custody may receive lower sentences than those less serious offenders tried by national courts,"[10] where death sentences can be pronounced. Through its articulations to local legal structures, the international judicial network produces a complex of differential routes for justice to be delivered, each with their own rules of procedures and sentencing, which in itself seems to challenge one of the basic principles of justice: could we say that today, if all are equal, it is not before the law, but before a variety of legal orders?

CR Nowadays it is obvious that there are many opportunities to obtain justice—far more than ever in the history of humankind. At the national level, the number of democracies with robust and independent judiciaries has been steadily on the rise. Internationally, there are now dozens of international courts and tribunals and human rights procedures available.[11] Be that as it may, gaps and failures still abound. The international judicial network is still in its infancy: most international courts were created less than twenty years ago, as the timeline shows. Internationally, we are still far away from the full realization of the principle of *ubi jus ibi remedium* ("where there is a right, there must be a remedy"), particularly if the holder of the right is an individual. There are many rights which lack a remedy because there is no competent forum to grant relief. But, again, what exists nowadays is a far cry from what existed until the end of the Cold War.

FS While the cases of international justice themselves connect and circulate through multiple institutional scales (from the domestic to the supranational), the architecture of the international judicial network has developed on a scalar model: on the one side, disputes between states are being arbitrated by dedicated judicial bodies which form a supranational level of authority; on the other side, under the principle of complementarity, the trial of an individual may only "step up" to an international judicial body if justice cannot be or is not being delivered at a local or national level, as you mentioned earlier. Thus, the existing international judicial network keeps the state as the touchstone of its architecture; with some rare exceptions, an international judicial body can only deal with matters that are entirely *contained* within the borders of states that have accepted its jurisdiction. Yet today, some of the crucial matters of our globalized world—such as matters of migrations, climate change, or global finance—involve factors and agencies that span across the borders of states and international regional communities. Legal fora capable of hearing and trying such matters do not exist yet. If they were to emerge, it is likely that these new fora would need to adopt a radically different architecture, perhaps one that would follow Bruno Latour's provocation—to have each matter or issue at stake gathering a different assembly of relevant parties around itself.[12] As a legal scholar, what challenges do you foresee to the emergence and activation of ad-hoc, "meta-national" legal fora, which would assemble all stakeholders and experts around a given issue, in order to deliver a legal decision?

CR It is absolutely correct to say that the existing international judicial network keeps the state as the touchstone of its architecture. This is both a strength and a limitation of the system. It is a strength because international courts derive their legitimacy from states' own legitimacy. By creating international courts and accepting their jurisdiction, states lend their legitimacy to courts, empowering them to administer justice in their name but also in the name of their peoples. It is a limitation because, as you said, not everyone or every problem can meet the criteria that limit international courts' jurisdiction. The way forward, however, is not to bypass states, lest legitimacy would be missed, but rather to complete the international judicial network so as to ensure that everyone, regardless of nationality or where she or he happens to be on the world map, can have access to a provider of justice.

1 Cesare Romano, Karen Alter, and Yuval Shany, eds., *The Oxford Handbook of International Adjudication* (Oxford: Oxford University Press, 2014).
2 Alex Jeffrey, "Justice Incomplete: Radovan Karadzic, the ICTY, and the Spaces of International Law," *Environment and Planning D: Society and Space*, vol. 27 (2009): 387–402.
3 Cesare Romano, "The Proliferation of International Judicial Bodies: The Pieces of the Puzzle," *NYU Journal of International Law and Politics*, vol. 31 (1999): 709–51.
4 Cesare Romano, "Can You Hear Me Now? The Case for Extending the International Judicial Network," *Chicago Journal of International Law*, vol. 10 (2009): 233–73, at 239.
5 Cesare Romano, "Deciphering the Grammar of the International Jurisprudential Dialogue," *NYU Journal of International Law and Politics*, vol. 41, no. 4 (2009): 755–87.
6 See André Nollkaemper, *National Courts and the International Rule of Law* (Oxford: Oxford University Press, 2011).
7 Benedict Kingsbury, "International Courts: Uneven Judicialization in Global Order," in *Cambridge Companion to International Law,* eds. James Crawford and Martti Koskenniemi (Cambridge: Cambridge University Press, 2012), 203–27.
8 See Model Court, "Resolution 978HD" in the present volume.
9 See ICC-01/04-01/06, *The Prosecutor v. Thomas Lubanga Dyilo*; and ICC-01/04-01/07, *The Prosecutor v. Germain Katanga*, http://www.icc-cpi.int, accessed September 2013.
10 Mark Drumbl and Kenneth Gallant, "Sentencing Policies and Practices in the International Criminal Tribunals," *Federal Sentencing Reporter*, vol. 15, no. 2 (December 2002): 140–44.
11 For a detailed examination of access to justice across the globe, subdivided according to the Aristotelian categories of retributive, corrective, and distributive justice, see Cesare Romano, "Can You Hear Me Now?"
12 Bruno Latour, "From Realpolitik to Dingpolitik, or How to Make Things Public," in *Making Things Public, Atmospheres of Democracy*, eds. Bruno Latour and Peter Weibel (Cambridge, MA: MIT Press, 2005), 14–41, at 15. Available to download at http://www.bruno-latour.fr, last accessed September 2013.

RESOLUTION 978HD: A VISUAL ESSAY

Model Court (Lawrence Abu Hamdan, Sidsel Meineche Hansen, Lorenzo Pezzani, and Oliver Rees)

"Resolution 978HD" was an exhibition which took place at Gasworks (London) from May–July 2013, continuing Model Court's ongoing research into the shifting infrastructures of international justice. Some of the visual material used here appeared in the exhibition.

The material presented here focuses on the trial of François Bazaramba, a Rwandan citizen who, after seeking asylum in Porvoo (Finland) in 2003, was tried by the local court and found guilty for his involvement in the 1994 Rwandan genocide.

In an unusual geographical inversion, the Finnish court moved to undertake proceedings in Rwanda and Tanzania, where witnesses were heard, while Bazaramba was not allowed to leave Finnish soil. Legal proceedings then had to be transmitted to and from Bazaramba's Helsinki prison cell via Skype and other video-conferencing technologies.

Universal jurisdiction, the legal principle by which the trial was conducted, is often presented as a form of "juridical utopia" whereby atrocities such as genocide and crimes against humanity can be tried without regard for national borders. Whereas most similar international cases are brought to the International Criminal Court in The Hague, the Bazaramba trial presents a unique example of a de-centered legal process. Its unprecedented use of media technology reconfigured the space of law and established an unexpected connection between peripheries.

This visual essay is based on material shot by Thomas Elfgren, the Finnish policeman who was the only individual to have followed the trial in its entirety. It is divided into eight chapters, each represented by a single image that explores a specific intersection of legal procedures and media apparatuses. The original photographs by Elfgren have been annotated by the Model Court group with short "log entries" and followed by extended captions.



1. Translation
In this trial, the court staff was often composed in equal numbers of legal professionals on the one hand and various types of "technician" on the other. Translation was a particularly delicate task that required the hiring of several members of staff. It was in fact impossible for the Finnish court to find a court interpreter that could translate the witness testimony directly between Kinyarwanda and Finnish. As an alternative they constructed a two-step translation chain, whereby the witness testimony was first translated from Kinyarwanda into French or Swedish, and then into Finnish. The court's answer followed the same steps, but inverted. This chain of translation would be too large to fit into a whisper cube at the back of the room so instead it was decided by the court that all interpreters were to sit on the bench together with the witness. The two interpreters were wired together with microphones and headsets and, even though they were seated next to one another, they used this audio setup to "reduce" their presence in the proceedings. This complex network of translation has increased the total duration of the trial by three-fold and has led to a record of more than 142 DVDs.



2. Crime scene
For the proceedings the Finnish court needed to produce aerial shots of the house in which François Bazaramba lived. These images provided the witnesses in court with a bird's eye perspective of the crime scene, in order to assist them in explaining Bazaramba's role in the attacks that took place on Mount Nyakizu on April 16, 17 and 18, 1994, which led to the death of thirty thousand people. In one of the first trial sessions in Rwanda, the Finnish court travelled 150 km from the courtroom in Kigali to conduct an on-site tour of where the killings happened. The lead prosecutor for the case acted as the tour guide as she explained to the court and to the camera how the attacks had played out. The tour also presented an opportunity for the court's technical team to produce more video and photography of the site from the ground, as they used their cameras to map the scene of the crime and to test the veracity of eyewitness testimony.



3. Tele-presence
The complex legal geography of the trial required François Bazaramba to be kept in detention in Finland while the Finnish court travelled to Rwanda and Tanzania to collect witnesses' testimonies. To allow Bazaramba to participate remotely in the proceedings in East Africa, an elaborate media infrastructure had to be put in place. A video conference setup that boasted a "true to life experience" was provided by Polycom. The image of Bazaramba was broadcast onto a computer screen located on the floor of the courtroom in front of the witnesses' bench, in such a way that the judges could simultaneously follow the witnesses' statements and Bazaramba's reactions. Thus witnesses could not see Bazaramba's image but could only hear his questions and comments from a loudspeaker, also located on the floor in the center of the room. This was a deliberate choice of the judges, who feared that the vision of Bazambaba's figure might have troubled the witnesses and not allowed them to deliver a fair testimony. Sometimes, after the session had ended, the video channel was left open, transmitting the image of Bazaramba's empty chair.





4. Transmission
One of the biggest challenges of the trial was to establish an audio-video connection that would allow Bazaramba to participate in his own trial in an adequate way. When the Bazaramba trial started, East Africa relied on satellite communication as the area still remained in a broadband shadow with no fiber-optic connection. This meant that the connection between Finland and Rwanda was constantly affected by the trade-off between image quality and speed of transmission: a balance between the two had to be continually negotiated to make sure communication remained uninterrupted while the quality stayed within acceptable levels. During the trial, a Chinese company started to lay fiber-optic cabling in Kigali. Rwanda aims to become the new media hub of Africa, and a series of companies are now competing to fill this gap by implementing fiber-optic cables that will connect East Africa to Marseille and Mumbai. In some areas fiber-optic cables even precede vital facilities like water and electricity.

5. Interference
"Today we again faced yet more issues with the video conference system. The balance of image quality is becoming almost political in this trial. The court secretary complained that the image on the screen kept freezing and reminded me that our entire claim for legal sovereignty in Rwanda was predicated on this connection which means that Bazaramba needs to be seen at a high resolution. Yet the connection also needs to be stable so that the proceedings do not stop all the time. The defence lawyer following the trial with Bazaramba in Finland also claimed that she was unable to participate in the cross examination because of a delay in the connection. The judge called for a break while we tried to synchronise the two spaces. In this situation, a lower quality of the image means that the connection can be smoother. We reached an agreement, a small delay was ok but if the latency exceeded 5 seconds we would stop the proceedings."

— Statement made by the Finnish policeman (pictured) in the film *Resolution 978HD*, 2013





6. Exposure
During the trial, lighting equipment was used to allow for the recoding of witnesses' testimonies. This was necessary in particular because the cameras' standard light-metering algorithm is calibrated to a fair skin complexion, and thus unable to register detailed visual information when recording a dark-skinned person. As this situation shows, universal jurisdiction and the media technologies it relies on carry the promise of a universal format. The emptiness of this promise, however, is revealed in the very way in which such technologies work—the way in which light is captured by camera sensors, cables transmit information, and memories are stored. The glitches that emerge from the friction between the smooth space of universalism and the material realities of our world constantly disturb the promises of international justice.

7. Truth Production
"Perhaps I should refer to a notion the Rwandans know very well and that is ubgenge. U–B–G–E–N–G–E and it refers to cunningness, being smart, not being caught red handed when you try to fool the other and acting and speaking strategically. In most European cultures I think we would call it lying.

"In a Juridical context I've said ubgenge refers to strategic speaking, it means for instance that a suspect or a witness wonders who asks me this question? Can that person harm me or help me? And so someone in Rwanda who answers a question always looks at the broader context. That is why for many Rwandans the notion of perjury, lying under oath, is completely strange or alien.

"It is a real challenge for a judicial system if you have to assume that witnesses are lying, because that would make in cases like these most evidence unreliable and that would in turn make justice impossible."

— expert witness testimony of Filip Reyntjens, Porvoo District Court, Finland, December 8, 2009

Case: White Phosphorus

Forensic Architecture in collaboration with SITU Research



Fig. 1. Francesco Sebregondi (Forensic Architecture) presenting the report "The Use of White Phosphorus Munitions in Urban Environments: An Effects-Based Analysis" at the United Nations Office at Geneva (UNOG) during the Annual Meeting of States Parties to the Convention on Conventional Weapons, November 12, 2012. Photo: Forensic Architecture.

Seeing through Smoke Screens: The Use of White Phosphorous Munitions in Urban Environments, Fallujah, 2004, and Gaza, 2009

During and in the aftermath of the Israeli attack on Gaza of December 2008–January 2009, known as "Operation Cast Lead," news reports have repeatedly shown images of a hitherto little known type of weapon. These images displayed airborne explosions releasing tentacles of smoking fragments onto densely inhabited parts of the Gaza strip. Alongside other images of the large-scale destruction of buildings and infrastructure, representations of these airbursts were some of the defining images of "Cast Lead." Research by several human rights organizations, based on military expertise, witness testimonies, projectile debris found on sites, and medical reports of burn injuries, confirmed that the Israeli military were using white phosphorus munitions.[1]

Because of its incendiary and toxic effects, the use of white phosphorus in populated areas is highly controversial. According to many international legal experts and scholars, it constitutes an illegal act as it effectively acts like a chemical weapon.[2] Israel initially denied the use of such munitions. When confronted with undisputable evidence to the contrary, the Israeli military changed its position and confirmed the use of white phosphorus, but claimed that it only used it "in compliance with international law."[3]

In March 2011, as part of a concerted civil society action, the Israeli human rights group Yesh Gvul, represented by attorneys Michael Sfard and Emily Schaeffer, submitted a petition to Israel's High Court of Justice demanding the complete ban of the use

Fig. 2. Photographic analysis. Summary of the methodology used in order to evaluate the height of burst of the M825 WP projectile by using urban structures as reference measures. Rafah, Gaza strip, January 11, 2009. Photo: Iyad El Baba/UNICEF. Visualization: Forensic Architecture and SITU Research.



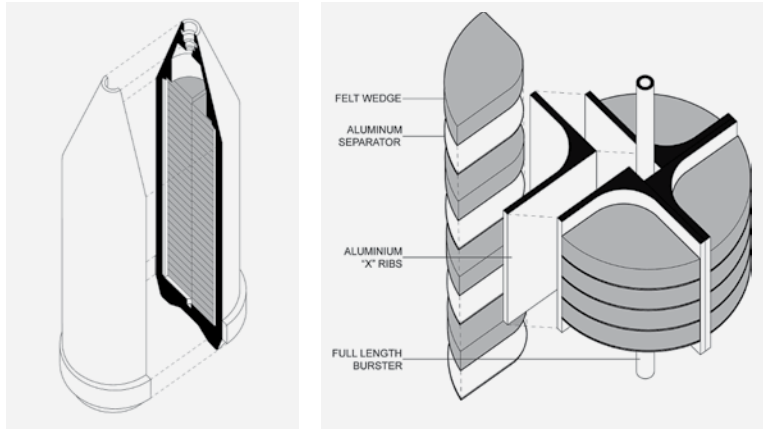


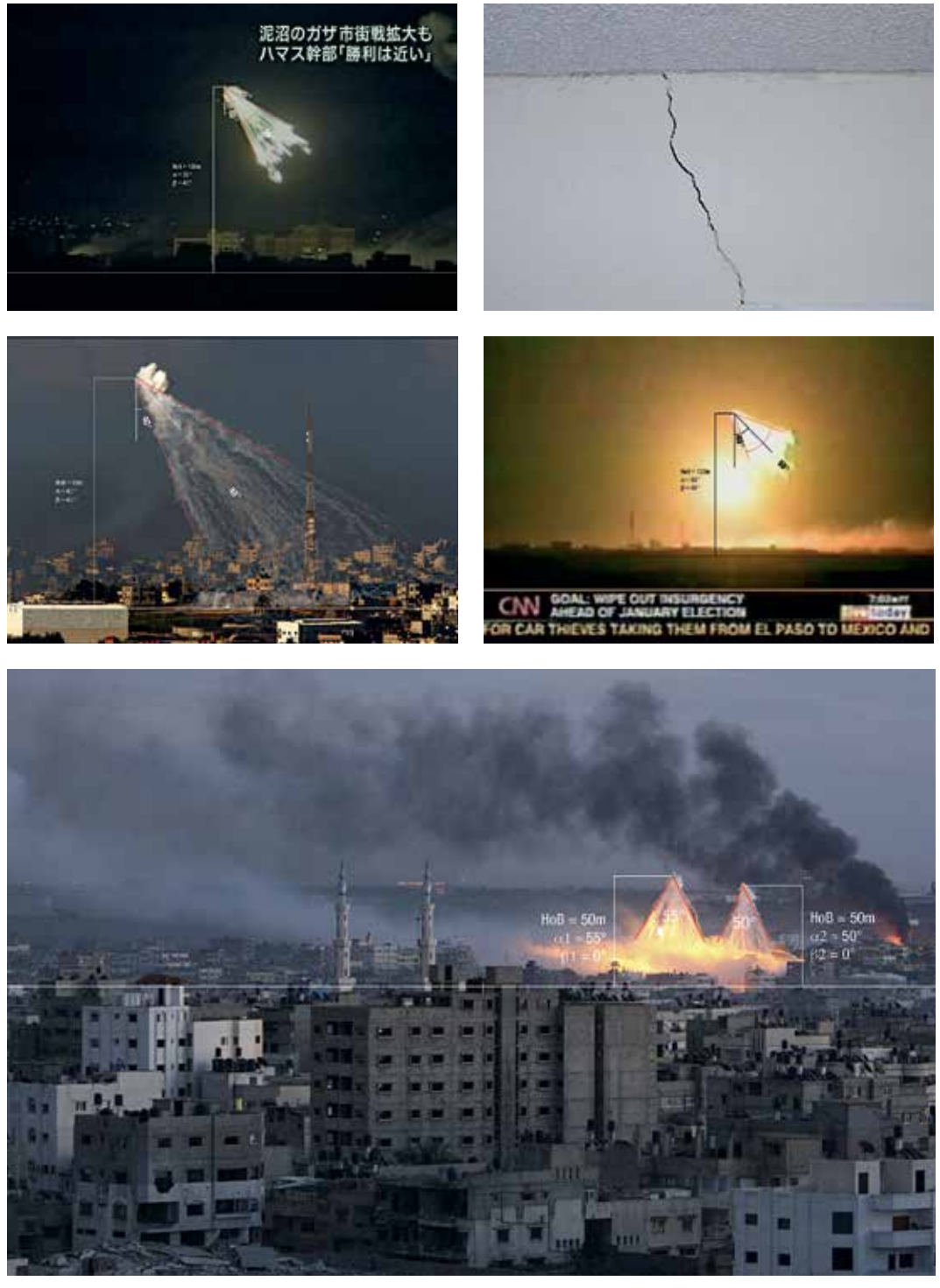
Fig. 3. M825 WP projectile diagram / White phosphorus wedges canister diagram. Diagrams: Forensic Architecture and SITU Research.

of white phosphorus munitions in populated areas by the Israeli military. It was in this context that the office of Michael Sfard asked Forensic Architecture to investigate the behavior and effects of such weapons. The outcome of our investigation was a report titled "The Use of White Phosphorus Munitions in Urban Environments: An Effects-Based Analysis."[4]

The report was first presented in the UN Office at Geneva, during the Annual Meeting of States Parties to the Convention on Conventional Weapons (November 12–16, 2012). It was later submitted to Israel's High Court of Justice, within the framework of Yesh Gvul's petition. With the material in the petition generating a strong adverse public opinion, the Israeli military—prior to the final hearing of the case in the High Court—declared on April 25, 2013 that it would stop using white phosphorus munitions in populated areas.



Fig. 4. Re-ignited charred white phosphorus wedge. Gaza, January 2009. Photo: B'tselem.



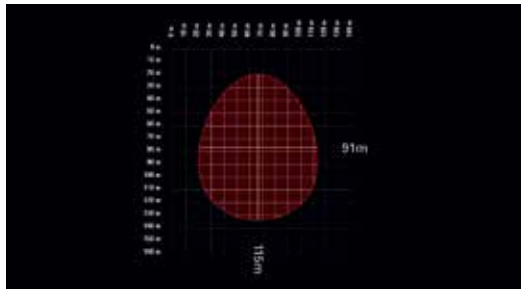
Figs. 5–9. Photographic analysis of M825 WP rounds. Evaluation of the height of burst (HoB) and the firing angles of the projectile. Photos: (from top left, clockwise) Gaza, January 2009, NHK World; Gaza, January 4, 2009, Eliyahu Ben Igal/Jini/Associated Press; Gaza, January 8, 2009, Mohammed Salem/Reuters; Gaza, January 3, 2009, Yannis Behrakis/Reuters; Fallujah, November 2004, CNN. Visualization: Forensic Architecture and SITU Research.

Methodology

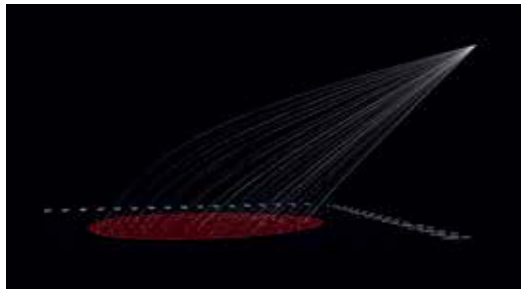
Among the variety of white phosphorus munitions that exist in military arsenals, this study focuses on the M825 WP projectile. In recent history, in addition to being used by the Israeli military in Gaza, it was also employed by the United States military in 2004 during operations in Fallujah, Iraq—another densely populated urban environment. At a pre-calculated height above its target, a charge at the front of the M825 WP shell is activated and the projectile separates into two parts releasing its contents: 116 felt wedges soaked in white phosphorus. Once released, the wedges fall to the ground in an elliptical pattern with a long axis of up to 200 meters. Immediately upon coming into contact with oxygen, white phosphorus begins to burn and produce a dense white smoke.

There are three distinct ways in which white phosphorus can cause harm to civilians. Direct contact with the felt wedges can cause severe injury, penetrating clothing and burning directly through skin and bone. The smoke is toxic and can cause severe irritation to the lungs if directly inhaled. But by far the most dangerous aspect of this projectile is its incendiary effect, as wedges become ignition sources that can start fires throughout the areas where they are deployed.

Our investigation focused on an Effects-Based Analysis of the M825 WP projectile as it interacts with a series of typical urban environments. The effects on urban environments are the result









Figs. 10–13. Evaluation of coverage area. 3D digital reconstruction based on footage of airburst M825 WP in Gaza, January 11, 2009. Image source: Al Jazeera. Visualization: Forensic Architecture and SITU Research.

Fig. 14. Photographic montage: impression of an M825 WP round fired in a central area of Tel Aviv. This was used in the context of the Israeli High Court petition to illustrate the dangers of the M825 WP projectile in an area that the judges knew well. Tel Aviv background image: Wikimedia Commons. Montage: Forensic Architecture and SITU Research.



of the specific characteristics of the projectile itself, on the one hand, and the built environment impacted on the other. The methods employed to produce this report therefore combined ballistic simulation with spatial analysis and urban reconstruction. The report analyzes the relation between the projectile and the built environment at both the urban scale and the architectural scale. The reconstruction of the behavior of the projectile was implemented both in order to determine its coverage area, and to catalog the types of damage to objects and persons in a range of contexts.

In producing the report, Forensic Architecture consulted military manuals and sought expert testimony—particularly that of weapons expert Chris Cobb-Smith.[5] However, a crucial source of information for this research was the visual material already available in the public domain: mainstream news media footage and reporters' photographs documenting the firing of airburst white phosphorus over Fallujah and Gaza. With the help of 3D-modeling software, spatial data was extracted from the still and moving images in an effort to reconstruct both specific events and the general characteristics of the projectile. This data was ultimately integrated into a parametric model that simulated the burst of the M825 WP projectile over typical urban environments, allowing us to analyze its effects, and the resulting civilian damage that can be expected.







Figs. 15–17. Simulation and visualization of the coverage area of airburst white phosphorus in the urban fabric of the cities of Tel Aviv, New York, Paris. Indication of the number of civilian objects impacted. Visualization: Forensic Architecture and SITU Research.

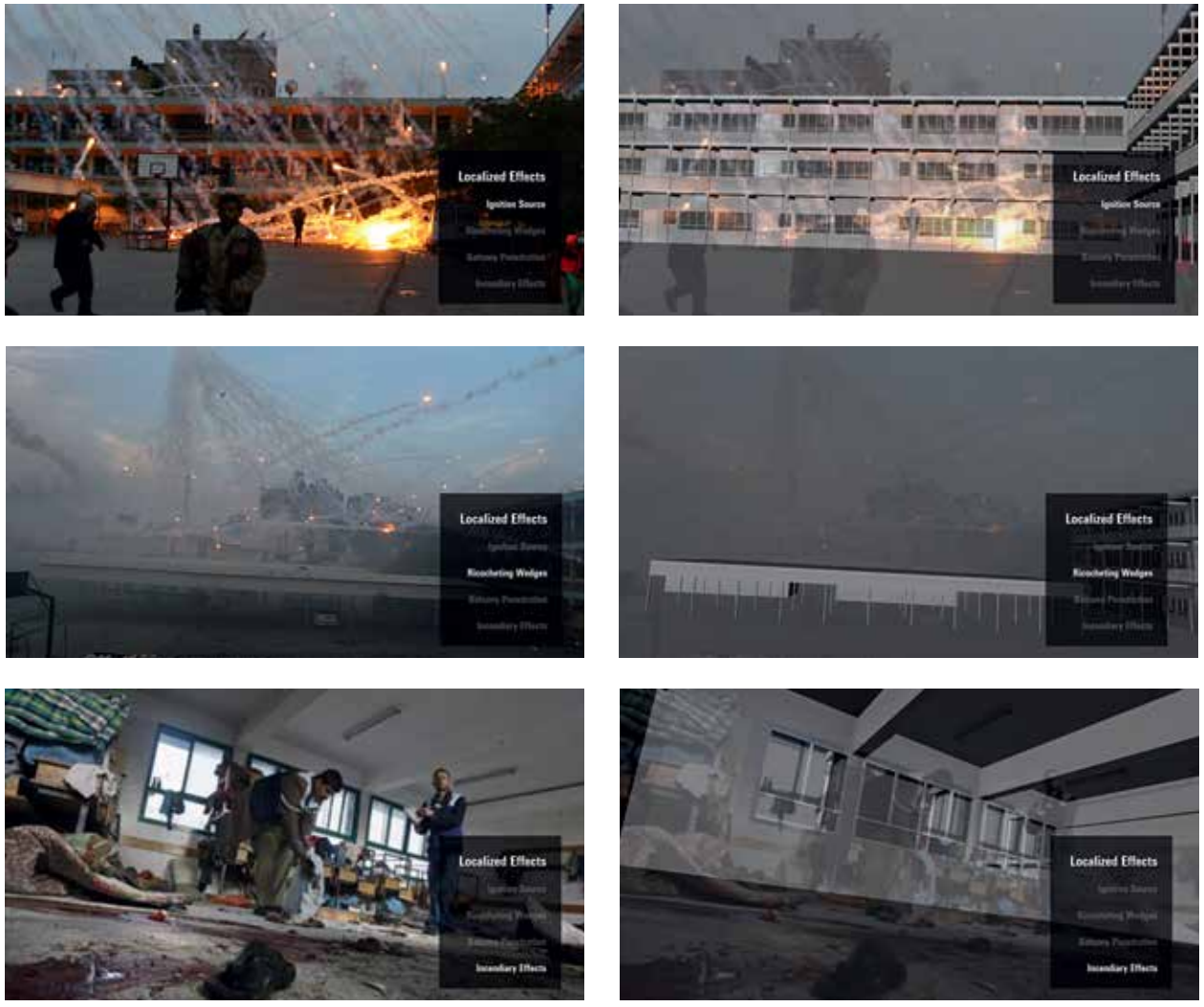


Fig. 18 a–f. Selected stills from the "Micro-Analysis" 3D reconstruction and animation. This refers to a January 17, 2009 attack on the United Nations Relief and Works Agency (UNRWA) school in Jabalya, Gaza hit by a series of M825 WP rounds. The incident was documented by the AFP photographer Mohammed Abed. In his series of photographs, the interaction between the white phosphorus wedges and the school complex are captured. In the report, these photographs are analyzed to elucidate a series of scenarios, as well as their potential effects, that may be expected at the scale of an inhabited building. Visualization: Forensic Architecture and SITU Research.

Legal Challenges

In addition to providing a spatial analysis in support of the specific petition submitted to Israel's High Court of Justice, the broader objective of this research was to produce a document supporting the call for a general ban, under International Humanitarian Law (IHL), of the use of white phosphorus in urban environments. In this regard, the strategy employed in the report was two-fold.

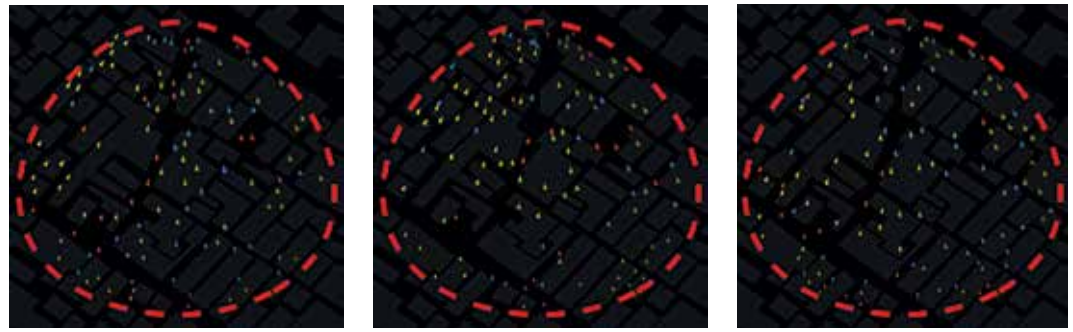


Fig. 19. Views in plan of three results from 150 iterations of the 3D digital simulation of the dispersal of the 116 white phosphorus wedges after airburst of an M825 WP projectile. Visualization: Forensic Architecture and SITU Research.

On the one hand, we attempted to demonstrate that the use of airburst white phosphorus in urban environments already violates an existing and fundamental principle of IHL: the principle of distinction (between combatants and civilians) and the related prohibition on indiscriminate attack.

Based on our analysis, we estimate the projectile's coverage area to be up to 30,000 square meters. Within this vast area, the exact distribution and trajectory of each white phosphorus wedge must be considered random, and any surface, object, or person situated directly under the burst of a white phosphorus round must be considered at risk of being directly hit by a wedge. Furthermore, the randomness of the distribution of white phosphorus wedges after airburst renders its indirect consequences for the civilian population—above all in terms of the fires it may ignite—also incalculable. Consequently, our report confirms the fact that the use of airburst white phosphorus in populated areas unavoidably creates a risk that civilians or civilian objects will be struck indiscriminately and must therefore be considered illegal under IHL.



Fig. 20. Ricochet-effect analysis. In white, the trajectory of ricocheting wedges. The fact that white phosphorus wedge can ricochet on urban surfaces impacted adds to the randomness of the overall effects of the M825 WP projectile. Photo: Mohammed Abed/AFP/Getty Images. Visualization: Forensic Architecture and SITU Research.

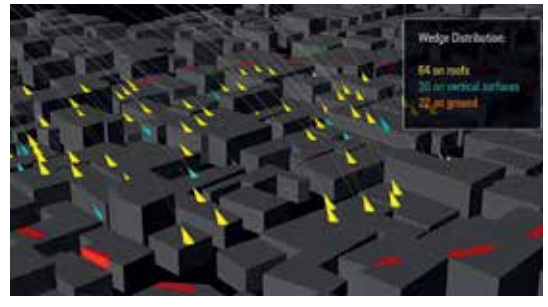


Fig. 21. 3D digital simulation of the airburst of an M825 WP projectile over a typical urban environment. Points of impact are marked according to type of urban surface impacted. Visualization: Forensic Architecture and SITU Research.



Fig. 22. Remains of a classroom in the Jabalya UNRWA school in Gaza after a fire ignited by one or more white phosphorus wedge. Photo: Mahmud Hams/AFP/Getty Images.



Fig. 23. White phosphorus wedges becoming ignition sources. Gaza, January 17, 2009. Photo: Mohammed Abed/AFP/Getty Images.

On the other hand, the report intends to support an on-going campaign (led by Human Rights Watch and Harvard Law School International Human Rights Clinic) demanding an amendment of the existing IHL. More specifically, the objective of this campaign is to close a loophole in Protocol III of the Convention on Conventional Weapons (CCW), regulating the use of incendiary weapons.

Protocol III prohibits the deployment of incendiary weapons in densely populated areas. Yet, in its Article 1, incendiary weapons are defined as weapons "primarily designed" to set fire to objects. Because white phosphorus munitions are designed as smoke munitions whose incendiary effects are considered only "secondary" or "incidental," white phosphorus is said not to fall within the category of weapons regulated by the protocol.[6] Due to this apparent loophole, since coming into force in 1983, Protocol III has failed to live up to its promise of protecting civilians from the effects of incendiary weapons.

By producing an Effects-Based Analysis of the use of white phosphorus munitions in urban environments, our goal was to support the demand for an amendment to Protocol III, in the form of a stronger definition of incendiary weapons that would be based on their effects, regardless of their intent or design.

Outcomes

On November 12, 2012, in the frame of an advocacy event on Incendiary Weapons organized by Human Rights Watch during the Annual Meeting of State Parties to Convention on Conventional Weapons (CCW), Forensic Architecture was invited to present the report to the diplomatic delegates of State Parties to the CCW in the United Nations Office at Geneva (see fig. 1).

Notwithstanding the vivid interest manifested by several delegates after the presentation, and in spite of a week-long lobbying process led by Human Rights Watch, no agreement was reached among State Parties with regard to re-opening

Fig. 24. Screen capture of a BBC news report on April 26, 2013 announcing the Israeli military's decision to stop the use of white phosphorus in populated areas.



Protocol III. Notable opposing States were Japan, Israel, and the United States. Given the current configuration of geopolitical power relations, the persistent opposition of such influential States means that it may be long before an amendment of Protocol III becomes a realistic possibility.

On March 5, 2013, Forensic Architecture's report was submitted to Israel's High Court of Justice as a supporting document for the petition demanding the ban of the use of white phosphorus munitions in urban environments by the Israeli military. Its admission as evidence encountered strong objections by the Israeli military/State Attorney, who questioned the competence of a team of architects to provide expertise on the military matters at stake in the case.

On April 25, 2013, while the question of the admissibility of the report was still being debated in court, the Israeli military issued a declaration stating that it would cease to use white phosphorus shells in populated areas—thereby yielding to the demand of the petition before the Court had to rule on it. The decision was taken "in the shadow of the court"—that is, as a consequence of a legal process but without a verdict—and, arguably, as a direct consequence of the Israeli military's estimation that they could not win the case.

A senior military commander explained: "As we learned during Cast Lead, [white phosphorus] doesn't photograph well, so we are reducing the supply and we will not purchase beyond what we already have."[7] Subsequently, the military informed the Court that it had ordered a "significant narrowing" of the use of these shells."[8]

The Israeli military's statement firmly places white phosphorus in a visual context. White phosphorus munitions are primarily designed to produce smoke screens in order to hide military movements. However, in Gaza, producing smoke screens was arguably not the main reason for its deployment. A possible alternative explanation is that the munitions were being used to clear the battlefield in a similar way to the US military's use of white phosphorus to "smoke out" insurgents in Fallujah in 2004.[9]

While the US Marines used white phosphorus to "smoke insurgents out of their hideouts" so they could be targeted, the use of white phosphorus in Gaza may have been part of a concerted military effort (that included the use of warning leaflets, phone and megaphone messages, and "knock-on-roof" non-explosive drone-fired missiles) to clear civilians and reporters from the urban battlefield, and this in order to allow the military more freedom of movement. It is prohibited by international law to attack people in order to scare them off battlefields. Beyond its illegality, Israeli warnings paradoxically also allowed for the proliferation of violence as the military felt free to attack houses that it believed to have been emptied.[10]

Footage we obtained shows the deployment of white phosphorus at night—when smoke screens would be ineffective—as well as its firing in areas that had no military presence to be masked on the ground. These elements suggest that white phosphorus may have been used in Gaza as a weapon of terror. A terror generated, firstly, by the visual spectacle of its airburst—the giant white hydra burning through the skies; and secondly, by the very real harm caused by hundreds of blazing wedges falling on some of the world's most densely populated urban areas, igniting fires and causing horrific chemical burns.

What in the battlefield may have worked as a spectacle of terror has become clear evidence against Israel's illegal use of white phosphorus. It was precisely the abundance of visual material from news footage and reporters' photographs that allowed us, retrospectively, to produce the analysis included in the report, and to make up for the absence of publicly available information regarding the ballistic behavior and effects of the projectiles—this information being deemed militarily sensitive and therefore classified. The striking visuality of white phosphorus is what may have simultaneously triggered its massive deployment during Operation Cast Lead, and set the conditions for a series of citizen actions that brought about strict limitations on its use.

On July 9, 2013, Israel's High Court of Justice delivered its judgment on the petition. In light of the Israeli military's declaration of their discontinuation of the use of white phosphorus, the Court deemed it unnecessary to issue a ruling that would explicitly ban its use in populated areas. The Court also acknowledged that the Israeli military had made a commitment only for the time being, and thus declared that if the policy regarding the use of white phosphorus is changed in the future, the petitioners should immediately be notified. Should the case be reopened, the court will discuss whether this report, produced by architects, could be accepted as admissible evidence.[11]

1 "Israel used white phosphorus in Gaza civilian areas," Amnesty International, January 19, 2009, http://www.amnesty.org/en/news-and-updates/news/israeli-armys-use-white-phosphorus-gaza-clear-undeniable-20090119; and Human Rights Watch report, *Rain of Fire: Israel's Unlawful Use of White Phosphorus in Gaza*, March 25, 2009, http://www.hrw.org/reports/2009/03/25/rain-fire-0.

2 The use of White Phosphorus in densely populated areas is controversial for other reasons as well. Most significantly, because it effects a wide area and can have an effect over an extended period of time (i.e. because of the extent of its spatiotemporal impact), its use in a densely populated environment can be expected to harm civilians in violation of the prohibition on indiscriminate attack.

3 "'IDF white phosphorus use not illegal,'" *Jerusalem Post,* January 13, 2009.

4 The report was published in two versions. The online interactive version can be accessed at http://forensic-architecture.org/WhitePhosphorus/. The printable pdf version can be accessed at http://www.forensic-architecture.org/wp-content/uploads/2012/06/WP-print-report-FINAL.pdf.

5 Cobb-Smith is Munitions Expert and Security Adviser to the International News Safety Institute.

6 Article 1(b) of Protocol III makes this exclusion of white phosphorus munitions further explicit. See "Protocol on Prohibitions or Restrictions on the Use of Incendiary Weapons (Protocol III)," Geneva, October 10, 1980, http://www.icrc.org/applic/ihl/ihl.nsf/Article.xsp?action=openDocument&documentId=2A921D989053D623C12563CD0051EEF9.

7 Idan Landau, "Israel gives up white phosphorus, because 'it doesn't photograph well,'" +972blog, April 28, 2013, http://972mag.com/israel-gives-up-white-phosphorus-because-it-doesnt-photograph-well/.

8 Gili Cohen, "IDF to stop using shells with white phosphorus in populated areas, state tells High Court," *Haaretz*, May 13, 2013.

9 Paul Reynolds, "White Phosphorus: Weapon on Edge," BBC News, November 16, 2005, http://news.bbc.co.uk/1/hi/world/americas/4442988.stm.

10 Eyal Weizman, "Lawfare in Gaza: legislative attack," Open Democracy, March 1, 2009, http://www.opendemocracy.net/article/legislative-attack.

11 The full judgment is available, in Hebrew, at http://elyon1.court.gov.il/files/11/460/041/b10/11041460.b10.htm, last accessed November 2013.

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Lawless Lines*

Decolonizing Architecture Art Residency (DAAR)
with Nicola Perugini

The various historical plans for partitioning Palestine—from the Peel Commission Report of 1936–37 to the Oslo Accords 1993—not only divided the land into a noncontiguous patchwork of territories, but also gave rise to a new spatial condition. Between the territories pulled apart another one has emerged; its expanse was the very width of the lines on the maps separating the different territories. Each partition line reflected both the geopolitical circumstances and the cartographic techniques of the time. The width of each of the lines was a function of the sharpness of the drafting instrument, the scale of the map, and the kind of surface on which it was drawn. Legally and mathematically a line has no thickness; it is a one dimensional trajectory. In this case abstract law and mathematics become a three-dimensional object upon their encounter with materiality. This short piece reflects on the potential in politically activating the flotsam generated by the materialization of the law.

Speaking of the 1948 cease-fire lines between Israel and Jordan, the Israeli political scientist Meron Benvenisti famously asked, "Who owned the 'width of the line'?"[1] The lines were drawn on a 1:20,000 scale map by the two military commanders, Moshe Dayan and Abdullah al-Tal. They met in an abandoned house in the Musrara district of Jerusalem and laid out the map on the floor. Each drew a line using a different colored chinagraph wax pencil: Dayan, green; al-Tal, red. The thickness and softness of the chinagraphs resulted in lines that were generally three to four millimeters wide. But whether because the floor under the map was uneven, or because Dayan and al-Tal were unskilled, in some areas of Jerusalem the width of the line became irregular.

This ambiguous legal space—a few millimeters wide on the drawing and more than a hundred meters wide in real space—was thus a consequence of the materialization of the jurisgenerative drawing process. In the most densely built-up area of Jerusalem, the lines were so wide they covered parts of neighborhoods, roads, and military outposts. In the following years, the physical extent of the width of the lines not only became the subject of debate and a disputation that continues to the present, but also resulted in border transgression and skirmishes.

Several decades later, in the early 1990s, the cartographic work undertaken during the Oslo process was conducted digitally—on computer screens—but the maps, signed by Yitzhak Rabin and Yasser Arafat, were

prepared in hard copy. Separation lines were now drawn throughout and across the West Bank, carving it up into the infamous Areas A, B, and C, in which Palestinians have different levels of limited control. These separation lines were drawn around every town and village. Because the documents signed were printed hard copies in which the lines were just over a millimeter wide, in real space the line acquired a width of 5.5 meters.

When the Oslo negotiations collapsed, the lines remained an open legal question. Without legal definition or a mechanism to resolve such questions, in the years that followed a series of legal challenges brought back the question of "who owns the thickness of the line?" Paradoxically, the question of the thickness of these lines returned to challenge the very partition they enacted.

These thin slivers of extraterritorial spaces are ubiquitous throughout the West Bank—they run at the margins of almost every town and village. As we walked along these lines—along the periphery of villages and towns, olive groves and orchards, fields, roads, gardens, kindergartens, fences, terraces, houses, public buildings, a football stadium, a mosque, a large, recently built castle, the Palestinian Legislative council—we thought that with Israel and the Palestinian Authority each exercising control over the respective sides of the line, the thickness of the line could itself be seen as "all that remains" of Palestine: a common, extraterritorial zone containing a sample of all the types of spaces. Walking along the lines, we encountered a series of legal conflicts that exemplified the borderline disorder of the area.



Figs. 1, 2. (above and top right) Rhodes agreement map, 1949. The hand drawn green and red lines are in variable widths as they go through Jerusalem. Source: UNISPAL Documents Collection.

The Red Castle

The proposal that the thickness of the line generated a legally undefined zone emerged as a legal question at the end of 2009 in the small village of Battir, west of Bethlehem. A right-wing Israeli NGO called Regavim, established with the aim of protecting nothing less than the "human rights of Israeli settlers" (!), submitted a petition to the Israeli courts for the demolition of a large private Palestinian house—built by a US-based Palestinian in a breathtakingly eclectic classical style and known locally as the "Red Castle"—that they claimed was partially "invading" Area C, the area fully controlled by Israel and where Palestinian construction is prohibited. Regavim is an effective political parody. It appropriates, mimics, and turns around the human rights discourse that its members claim is often successfully used by left-leaning groups against the settler movement.

The owner of the castle and the local village council commissioned surveys that identified the exact position of the line. But to their surprise the line ran right through the living room and restrooms, cutting the house in two parts—or in fact in three. The eastern part was in Area B, the western part was in Area C, and a strip of the house, 5.5 meters wide—the line itself—was in some undefined extraterritorial status. The house was not demolished but this sliver of architectural-scale extraterritorial space has haunted us since.



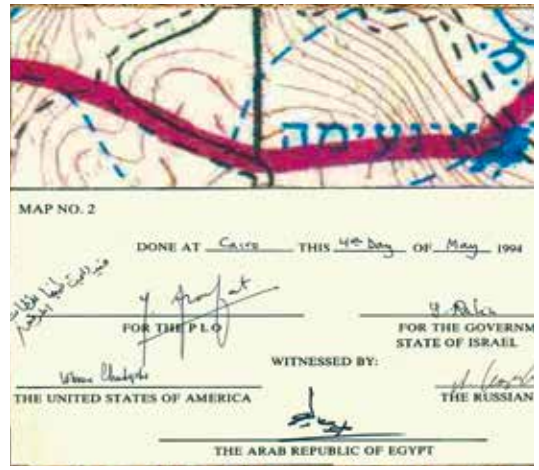


Fig. 3. (above left) A detail of the map attached to the 1994 Cairo agreement (part of the Oslo Process) above the signatures of the parties.

Fig. 4. (above right) The width of the line crossing the "Red Castle" in Battir. DAAR/Amina Bech, 2010.

The Mosque

We walked north. In the village of Burin, southwest of Nablus, the line between Areas B and C crossed a section of the majestic Salman al-Farisi mosque, built in 2008. Eighty percent of the mosque was in Area C, with the remaining twenty percent included in the thickness of the line and in Area B. At the beginning of 2010, under the pressure of Jewish settlers who live in nearby settlements and have previously attempted to burn this mosque, the Israeli Civil Administration sent to the local village council a demolition order which is still pending.

The House

Back in the north part of occupied Jerusalem we found another house traversed by the line. The Bardans, a Palestinian couple, lived in this house, near the village of Akab, on the 1967 unilaterally declared borders of Jerusalem. As residents of Jerusalem, the couple were given temporary Israeli IDs which, under the logic of Israeli colonization, provide more access to public welfare and a greater freedom of movement. But the state suspected that the house was on the borderline. When the Labor Court of Jerusalem, tasked with arbitrating this issue, asked a surveyor to draw







Figs. 5–7. The thickness of the line. DAAR/Amina Bech, 2010.

the exact location of the line in relation to the house, the result was that the line seemed to have traversed the house in the following manner: 54.2 percent of the property was outside the Jerusalem jurisdiction area, while 48.8 percent of the property was inside it.

The court assigned no thickness to the line. The Israeli National Insurance Institute claimed that since most of the house was outside Israeli territory, the Bardans have not lived in Israel. They sought to use this opportunity to excise the Bardans, like so many other Palestinians, from access to Israeli welfare. Through their lawyer, Ghiath Nasser, the couple tried to explain that although that might be the case, they spent most of their time in the bedroom, which was, together with the entrance to the house, in Jerusalem, and therefore that they spent the center of their life in the city. The National Insurance Institute argued against this claim saying that a person could easily change the configuration of rooms to suit their purposes. At this point the concept of the "thickness of the line" was brought up by Ghiath Nasser. Pointing to the historical reference of the 1948 line, the couple claimed that the entire house was in fact *within* the line.

The Parliament

Undoubtedly, the most challenging situation we have encountered along the area's multiple partition lines was that of the Palestinian Legislative Council building—known colloquially as the "Palestinian Parliament"—located in Abu Dis, just outside the 1967 unilaterally declared borders of the city.

Upon visiting the building, it became evident that it was simultaneously a construction site and a ruin, brought to this state neither by military violence nor natural deterioration, but by the failure of the politics of the "peace process."

The project began in 1996, during the euphoria of the Oslo Process. The choice of the location of the building was the product of political maneuvering. Some prominent members of the Palestinian leadership wanted





Figs. 8, 9. The line crossing the interior of the Red Castle. DAAR/Amina Bech, 2010.

to locate the building as close as possible to the Al Aqsa mosque—demonstrating it to be a mere stepping stone towards the ultimate establishment of Jerusalem as the capital of the Palestinian State—while Israel, insisting that no Palestinian institutions will be built in Jerusalem, pushed the Parliament outside their unilaterally declared borders of the city.



Fig. 10. Advocate Ghiath Nasser demonstrating to DAAR the complexity of establishing the path of the border lines around this residential building. He is pointing to a dotted line that marks the extent of the thickness of the line on one side of the marked line (red) that he established. DAAR/Amina Bech, 2010.

Abu Dis, once a village and now the closest town to Jerusalem's Old City, was chosen as a site. In order to demonstrate that the building was positioned as close as possible to the old city, its architect even sought to locate it in such a way that one of its edges abutted the borderline itself. In 2003, three years after the collapse of the Oslo Process, the eruption of the Second Intifada, and the construction of the wall just a few meters from the building, all construction work on the Parliament stopped.

*

The Palestinian Legislative Council in Abu Dis is the last iteration of Palestinian experiments with parliamentary democracy. But its establishment masked the importance of another form of assembly—the Palestinian National Council—known as the parliament-in-exile, which is the only Palestinian assembly aspiring to represent all Palestinians whether they are in Israel, occupied Palestine, or in exile. Parliaments-in-exile were a form of experimental

democracy exercised throughout the years of exile of the Palestinian Liberation Organization (PLO), when parliamentary gatherings sought to account for a scattered and extraterritorial polity, a polity in conflict, without the possibility of arranging a census on the base of which proportional representation could be organized.

These parliaments-in-exile assembled once every two years, or thereabout. The first session met in Jerusalem in May 1964 (before the occupation, its meetings did not have to be in exile…), with representatives from Palestinian communities in Jordan, the West Bank, the Gaza Strip, Syria, Lebanon, Kuwait, Iraq, Egypt, Qatar, Libya, and Algeria. Sessions were held in Cairo (1965, 1968–77), Gaza (1966, 1996, and 1998), Damascus (1979–81), Algiers (1983, 1988), Amman (1984), and Ramallah (2009). The location of these councils marked the geopolitical transformations of the region, the history of the Palestinian struggle, and the migration of its organizational centers.



Fig. 11. The construction site/ruin of the Palestinian Legislative Council building, Abu Dis. DAAR, 2010.



Fig. 12. There was some confusion regarding where exactly the unilaterally defined borders of Jerusalem end. DAAR/Cressida Kocienski, 2010.

True, the National Council is a PLO body and the PLO has come into much disrepute since the failure of the Oslo Process, eventually losing its leadership role in the Palestinian struggle; but its extraterritorial aspirations and modes of operation could be seen as a starting point for any attempt to organize a new form of common assembly. These robust and sometimes controversial parliaments-in-exile survived precisely because their gatherings had no fixed seats. Territorialized, like the Legislative Council, it would have become an easy prey to Israeli politics.

In seeking to understand the cartographic realities of this building, DAAR commissioned a Palestinian surveyor, Khalil Tofakji, to draw for us the exact location of the line in relation to the building. He brought us what he called "bad news": mistakenly perhaps, the building was constructed with the border running not besides it, not along one of its edges, but straight through it!



Fig. 13 a-f. The cleaning of the line through the Palestinian Legislative Council building. DAAR/Cressida Kocienski, 2010.



Fig. 14. The Palestinian National Council in Cairo, March 22, 1977. Source: Palestinian National Television Archive.

The interior of the parliament building, Tofakji explained, is partly within the Israeli controlled area and partly within the Palestinian controlled area, with a narrow strip, as wide as the borderline itself, potentially in a legal limbo of an extraterritorial no-man's-land. These zones corresponded to the types of spaces across which Palestinians are dispersed, with the thickness of the line acquiring a strong symbolic power—representing those Palestinians in the diaspora excluded from participation in political decisions within Palestine. The fact that the building exists across a series of legal territories is a good start, we thought.

Most Palestinians are living as refugees outside Palestine in different states throughout the region. In some of these states they are effectively excluded from political representation. Many Palestinians have never had the chance to vote. Those within Palestine are forcibly separated into several distinct locations: Israel, Gaza, the West Bank, and East Jerusalem. This fragmentation has been one of the most effective means of controlling and dominating Palestinians.

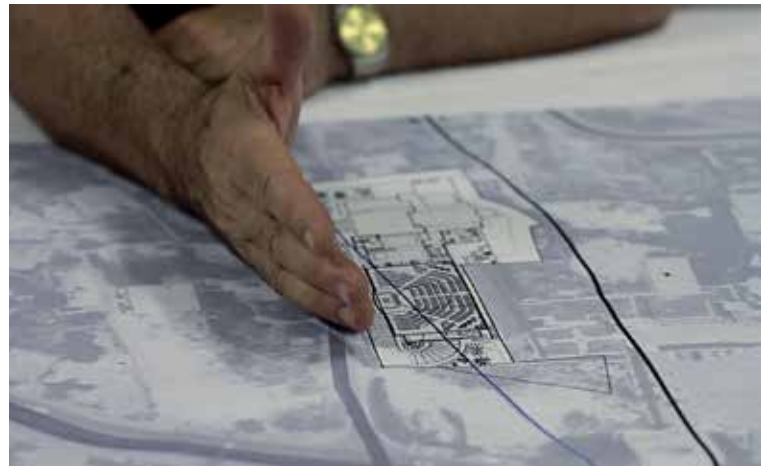


Fig. 15. The surveyor, Khalil Tofakji, discovered that the line went right through the building. DAAR/Cressida Kocienski, 2010.

A common assembly that represents all Palestinians is thus simultaneously necessary and impossible.

While DAAR always seeks its opportunities for projects within the most aggressive of colonial structures, here we found them within the line itself. We thought that the thickness of the line could designate a common space, a new political forum. We called this forum a "common assembly," to make it distinct (spatially and politically) from a parliament. The idea of a "common assembly" might refer to claims to immanent democracy that have emerged across the streets and roundabouts of the Middle East. We learned from the activists of Tahrir Square that "cleaning the square" is what transformed it from a "public" space—the space of the regime—into an effective political common—the immanent space of the people.





Fig. 16. (previous pages) The line through the Palestinian Legislative Council building. DAAR/ Carina Ottino, 2010.

Fig. 17. DAAR, "Common Assembly," Nottingham Contemporary, UK, 2012.

We ourselves engaged with an act of cleaning. Carefully measuring and tracing the line that the surveyor has drawn inside the building, we swept and polished it clean (as much as we could), producing a 1:1 scale architectural drawing right through a thick layer of ten-year-old dirt and bird droppings. The strip— the thickness of the very apparatus of division—was our effective common assembly: a political forum emerging out of the legal flotsam of the illegal process of Israeli colonization. Our intention was to take the thickness of the line to different places worldwide, activating it as a common assembly—a parliament in exile.

* An extended version of this essay was published as chapter 5 of Alessandro Petti, Sandi Hilal, and Eyal Weizman, *Architecture after Revolution* (Berlin: Sternberg Press, 2013).

1 Meron Benvenisti, *City of Stone: The Hidden History of Jerusalem* (Berkeley: University of California Press, 1998), 57.


SECRETS

Introduction, Part II: Matter against Memory

Eyal Weizman



Fig. 1. Robert Jan van Pelt pointing to the ruins of Crematorium II in Auschwitz-Birkenau. The gas chamber is on top and the arrows point to the probable locations of the holes in the ceiling. It is the largest existing ruin of a gas chamber, most others having been completely destroyed and removed. Source: Daniel Keren et al., "The Ruins of the Gas Chambers: A Forensic Investigation of Crematoriums at Auschwitz I and Auschwitz-Birkenau," *Holocaust and Genocide Studies*, vol. 18, no. 1 (Spring 2004): 68–103.

The new millennium started with a bizarre legal battle. The David Irving trial, which unfolded at the English High Court of Justice between January and April 2000, involved one of the most intense presentations and aggressive cross-examinations of architectural evidence as part of a legal process on record. In 1996, seeking publicity for his cause, David Irving sued an American writer and her publisher for libel, for calling him "the most dangerous of all Holocaust deniers and a falsifier of history."[1]

This debate was one of the starting points for the trajectory of thought practice that lead to our conception of forensic architecture. It also demonstrates the relations between material investigation and the politics of negation that are central to this practice.

On the tenth and eleventh days of the trial, January 26 and 27, the legal debate revolved largely around the architecture of one of the gas chambers—an underground structure that was part of Crematorium II in Auschwitz-Birkenau. Irving, representing himself, focused his cross-examination of the expert witness facing him—historian Robert Jan van Pelt—on the existence of four small holes in the remains of the ceiling of the concrete ruin of the structure. The seven-hundred-page expert report van Pelt prepared on behalf of the defense is one of the most important precedents for the practice of forensic architecture.[2]

According to the few surviving witnesses, both perpetrators and victims, it was through these holes that the contents of canisters of cyanide poison known as Zyklon B were introduced into a room packed with thousands of people. On the tenth day of the trial, Irving initiated the following exchange with van Pelt.

IRVING You do accept, do you not, that the whole of the story of the 500,000 people killed in that chamber rises or falls, rests or falls on the existence of those holes in that roof?

VAN PELT No.

I We only have the eyewitness evidence.

VP I disagree with that. The whole story rises and falls on the evidence that this room was a gas chamber, which is a slightly different issue.[3]



Fig. 2. Fredrick Töben, an Australian negationist, going through a hole in the roof of Crematorium II at Auschwitz-Birkenau. He tries to demonstrate that the opening was too large to have been one of the lethal holes. Source: http://codoh.com/library/document/2978.

On the following day, after going through several other architectural and functional details, Judge Charles Gray addressed van Pelt directly: "You have not seen any holes in the roof, have you—when you went there?"[4] Van Pelt had to answer in the negative. Indeed, van Pelt's expert report, submitted to the court before the session, conceded that "these four small holes […] cannot be observed in the ruined remains of the concrete slab," but explained that verification was impossible, due to the state of the ruin.[5] He also suggested that it would have been logical for the Nazis to backfill these holes with concrete before they retreated in January 1945. Van Pelt explained the absence of evidence as the result of the Nazis' attempt to remove and destroy all incriminating traces.

Negation compounds two forms of violence: the violence against people and things, and the violence against the evidence that this violence did take place. At the end of his cross-examination Irving offered van Pelt nothing less than a deal:

I And you do accept, do you not, that if you were to go to Auschwitz the day after tomorrow with a trowel and clean away the gravel and find a reinforced concrete hole where we anticipate it would be from your drawings, this would make an open and shut case and I would happily abandon my action immediately?

VP I think I cannot comment on this. I am an expert on Auschwitz and not on the way you want to run your case.

I There is my offer. I would say that that would drive such a hole through my case that I would have no possible chance of defending it any further.[6]

According to Irving's logic, nonexistent holes in the roof would constitute holes in the case. Without evidence for these holes, the room could not have functioned as reported. The witnesses, according to Irving, were deluded or lying. If this room was not a gas chamber, Auschwitz could not have been a death camp, Irving's logic continued. Without Auschwitz as the functional, and later the symbolic, center of the extermination process, the Holocaust, as a premeditated industrialized policy of racially motivated killing, must never have happened. This was, in short, the essence of his claim to have been libeled when called a denier. A similar linear logic was at work in the devilish formulation of Robert Faurrison, the negationists' puppet-master: "no holes, no Holocaust."[7] Irving conjured the holes as the barrel of the gun and claimed that it was impossible to condemn the Nazis (and him) without them.

While Irving's political logic was content to stop with proclaiming the innocence of the Nazis, the "lies of the survivors," and the "fallacy" on which the state of Israel was established, a more bizarre phenomenon is represented by those revolutionary groups who have, since the 1980s, supported those denying the Holocaust.[8] They see the narrative of the Holocaust, expounded by museums, documentary and feature films, university programs, and archives, as forming the cultural and intellectual basis on which the liberal-democratic-capitalist order rests. Without the Holocaust, the entire apparatus of Western democracy post-World War II—the Fourth Geneva Convention, the 1948 Universal Declaration of Human Rights, the concept of genocide, the United Nations as a system aspiring to manage conflict, maintain international order, and undertake peacekeeping, even the ethical basis for American domination, perceived, in its own eyes, as the bulwark against an "evil" modeled on the Nazis—would stand on nothing. The Holocaust, they have argued, stands in the way of a global revolution precisely because, through its association with the category of totalitarianism, it was mobilized in order to equate Nazism with Communism and suggest that "evil" lurks behind every attempt at radical political transformation or liberation struggle. Instead of confronting the way in which the use of the Holocaust shaped the politics of the present as that of the "lesser evil," these groups have sought to reinvent history, thus discrediting their claims.[9]

Staking the entire case of the Holocaust on the existence or nonexistence of holes in a fragmented and almost pulverized concrete slab may have the appearance of a desperate act, but it seems that during the 1990s for Holocaust deniers the holes had begun to occupy a place analogous to that of stigmata. The use of material evidence (in this case the use of the absence of crucial material evidence) to contradict the power of survivors' testimony was by then the established method of Holocaust deniers. Witness testimony, Faurisson elsewhere claimed, produced "too much metaphysics, not enough materialism."[10] The evidence presented was deemed too indirect, at best circumstantial, an assembled collection of disparate data, none of which was conclusive and all of which lacked the power of the "thing in itself."

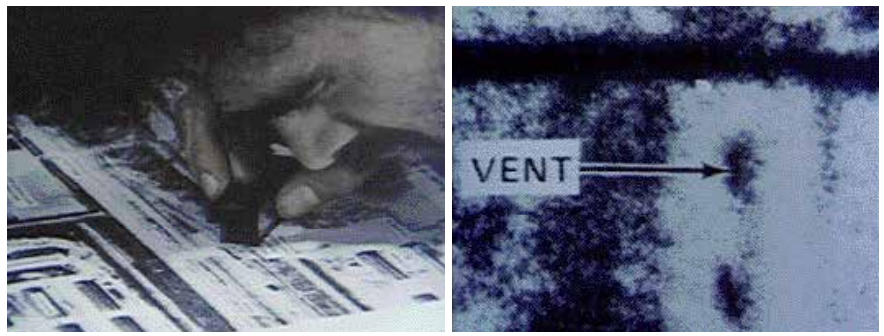
Paradoxically, a similar approach in 1983 helped uncover a truth and brought Irving some fame for being the first to call the "Hitler Diaries" fake, after several of its pages had been authenticated by distinguished historians concentrating their analysis on issues of style, voice, and historical fact. From the floor of a pressroom at the headquarters of *Stern* magazine in Hamburg, into which he was able to sneak, Irving shouted "check the ink," before being thrown out.[11] The ink was later dated to the 1950s. It was ink as the material *carrier* of words that was mobilized against the very words written with it.

In the 1996 trial, however, it was not ink but architecture —or more precisely, the absence of a particular piece of architectural evidence—that Irving sought to mobilize against witnesses' memories. Given that a hole can be understood as "nonmatter," Irving was effectively pointing to the

absence of an absence. Irving regarded this double absence as functioning in the manner of what legal theory refers to as "negative evidence"—an absence of material evidence that is evidence in itself. "Negative evidence" can, potentially, be used to dismantle complex constructions and networks of knowledge. This was the way it was employed here—as an attempt to dismantle the assemblage of evidence for extermination. For van Pelt the "presence" of "negative evidence" demonstrated the very opposite: that the Nazis were engaged in Holocaust denial—that they were in fact the first Holocaust deniers—well before people like Irving took up this task. In any case, the absence of evidence was certainly not evidence of absence.

Irving also based his case on the claim that none of the few surviving representations of the roof showed either holes or the shafts to which they were connected. Where the shafts did appear, as in one famous image (see fig. 4. in "The Architecture of Negation" in this volume), he claimed they were insulating rolls standing on the roof.[12] It was hard to confront this stubborn logic. Van Pelt patiently explained that none of the drawings of the gas chamber showed the holes, because the architects were not allowed to draw in these pieces of incriminating evidence.

An aerial photograph shot by an Allied reconnaissance mission aiming to document a nearby petrochemical factory on August 25, 1944, was one of the very few documents to have showed the roof of Crematorium II. A single 35 mm negative from an automated sequence of photographs shot along the flight path of a Mosquito reconnaissance plane captured an area about the size of five by three miles. This photograph included the Birkenau camp, and the roof in question was captured at one of the edges of the image, close to the area of the lens's parallax distortion. When enlarged, four blurry marks could be seen on the roof. The image, along with a few other aerial photographs from the spring and summer of 1944, were discovered and annotated only in 1978 by two CIA image analysts. Harun Farocki's 1988 film *Images of the World and the Inscription of War* presented blowups of these photos. The blurry marks on the roof were annotated by the CIA as "vents."[13] Irving claimed that the marks could not be the holes in the roof because they were too large and their form was undefined, and insinuated that the negative had been tampered with by the addition of brush strokes.



Figs. 3, 4. Stills from Harun Farocki, *Images of the World and the Inscription of War* (Germany, 1988), 74 min. Right: CIA agents examine the aerial images they have discovered. Left: The film presented blowups of these photos in which the blurry marks were annotated by the CIA as "vents" leading to the holes.

Van Pelt presented a report by Nevin Bryant, supervisor of image processing applications at NASA's Jet Propulsion Laboratory in Pasadena and one of the world leaders in the analysis of aerial and satellite images. While the CIA analysts enlarged the negatives in an analogue fashion, Bryant used digital technologies to revisit the issue of the photo's evidentiary value. After enhancing it with software programs used by NASA for satellite image interpretation, Bryant was able to peer into the "molecular composition of the film." At this magnification he could confirm that the blurs on the aerial images were caused by the effects of the chemical process of image capture on the surface of the film, and suggested that they might be the result of an interference pattern or a moiré effect of the kind that tends to develop when the size of a single silver salt particle in the emulsion of the film is larger than the element it is exposed to capture, in this case the size of the hole.[14]

When the size of the hole approximates to the size of a silver salt grain, it has entered *the threshold of detectability*, a condition significant in the forensic evaluation of photographs. Within this condition the materiality of the object represented—the roof or the hole—and the materiality of the surface representing it—the surface of the negative—must come simultaneously under intense scrutiny. Both the roof and the negative were simultaneously examined as images and as material things, the former made of concrete and the latter of silver salts.[15] One materiality was reflected in another. Just like a negative, the concrete roof was a recording device, a sensor imprinted not with light but with historical processes. If forensic architecture emerged at the Irving trial as a new kind of archaeology, it was not an archaeology of material excavation but rather an archaeology of the physicality of the media by which it was captured.

As the cross-examination of van Pelt went on, it became clear that against the singular nature of Irving's negative evidence, van Pelt had woven an increasingly complex and convincing network of converging evidence. This included the interpretation of architectural plans drawn from the archive of Auschwitz Central Construction Office, aerial photography, letters, diaries, logbooks, testimonies, and groundlevel photographs—which together produced a narrative that could recalibrate in relation to any new discovery and finding that was presented. Anyone interested in learning more about this analysis should read one of van Pelt's many books about Auschwitz, which overwhelmingly made the case for its history as an extermination camp, in addition to the interview we conducted for this collection.[16]

Irving lost the case, and our aim is not to reopen it. The significance of this trial was not in challenging the story of the Holocaust but rather in the fact that it introduced new methodologies and epistemic frames—architecture, its media representations, their materiality, and their threshold of visibility—into the historical method of World War II research, and from there into the analysis and investigation of other conflicts, establishing a set of important concepts for the practice of forensic architecture.

Environmental Negation

Coincidentally or not, when climate change denial emerged as a significant force in the mid-1980s, around the same time that Holocaust denial became prominent as a pseudoscientific discourse, its first battle was around another hole. Climate change deniers were of course obsessed with refuting the existence of the hole in the ozone layer—a protective ceiling that otherwise absorbs the major part of the sun's ultraviolet radiation. The hole, generated by CFC emissions, was discovered and negated in close succession in the second half of the 1980s. Just like the holes in the ceiling of Crematorium II, it is through the "Antarctic stratospheric ozone depletion zone" that a lethal substance—in this case radiation—may reach the surface of the earth and threaten to destroy most forms of life on it. The entire earth would thus become a toxic space.[17]

"Climate change skeptics," as deniers prefer to refer to themselves, supported by companies responsible for aerosol emissions, mobilized to claim that the hole in the ozone layer did not exist, that the sequence of operations that had "confirmed" its existence—involving sensing, processing, and modeling—was prone to error and manipulation and that the image created was but one possible scenario amongst others.

A climate model is a mathematical construction conceived to predict probable future scenarios based on past data, but it is also an image, a visual representation in a time-based cartography drawn on various scales. While a photograph documents events past, the model produces image representations of possible futures; however, in an analogous manner to a photograph, the model has a resolution, created by the distribution of climate data sensors placed across the surface of the earth, in oceans, and in the different layers of the atmosphere. Because the sensors are not evenly spaced, the model has variable resolutions across its extent: it is denser in some parts, where microconditions produced by, for example, cities, islands, or lakes exercise stronger effects on the environment; and less dense in others, such as oceans and also, of course, Antarctica, which was, until the automatic weather-station construction spree of the 1990s, of such low sensor resolution that it could indeed be said to be at the threshold of detectability of the model.[18]

Climate change skeptics demanded material proof rather than mathematical constructions. A 1995 Congressional session of the Subcommittee for Energy and Environment of the US Congress's Committee on Science ominously titled "Stratospheric Ozone: Myths and Realities" heard the following statement by Vernon J. Ehlers, the Republican representative of Michigan, a state with an abundance of polluting industries. In a manner typical of climate change skeptics, Ehlers claimed that climate sciences are "trans-scientific." The claims for the ozone hole "are scientific in their origin" he said, "but they're in a sense beyond science because we cannot do the experiments. We cannot go up and create an ozone hole and see what the impact is. And so we can merely observe, model, predict. Then observe again, model again, predict again. This results in large uncertainties in the scientific results. And the difficulty is that, as a result, you will find scientists on both sides of issues… "[19] In fact there weren't scientists on both sides of this issue, but presenting loony theories as an equal position in a legitimate debate was always the aim of negationists.

It is true, as Seth Denizen has confirmed, that the hole in the ozone layer should not be understood as a static feature in the way a hole in solid concrete might be. The contours of the ozone hole "took shape" only when the scientists "created" them by filtering their data through selective categories and then used this cross section of data to create an image. The raw data that the scientists initially recorded, Denizen explains, "even once it was plotted, still did not appear as a hole: it was scattered, showing no definite trend."[20] Representing ozone levels only during southern hemisphere spring-times was the only way to illustrate the steady decrease in the ozone levels in an area of the stratosphere the size of North America. But this seasonal phenomenon need not necessarily have been described as a "hole." The hole was constructed as a concept and as an image in order to call for action. The choice of the word and the way it was drawn, as Denizen describes it, was intentional, a masterstroke of forensic aesthetics. Meteorologist Jonathan Shanklin, who, in 1985, together with two other scientists from the British Antarctic Survey, Joe Farman and Brian G. Gardiner, discovered the seasonal thinning in the ozone layer over Antarctica, seems to have since been made aware of the power of the "hole" metaphor: "In retrospect, that was a really good thing to call it" he recalled years later, "because an ozone hole must be bad. Almost automatically, it meant that people wanted something to be done about it. The hole had to be filled in."[21]

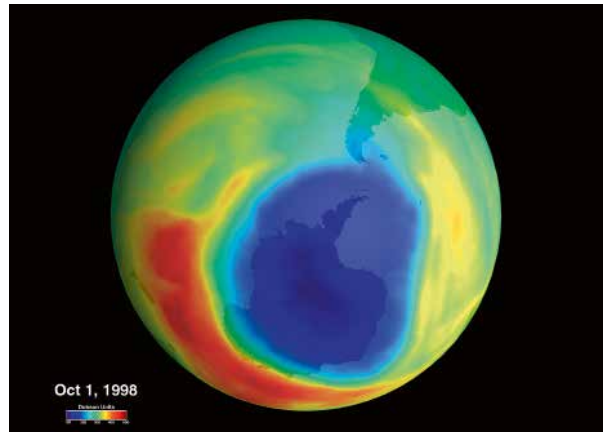


Fig. 5. False color image showing the large ozone hole over Antarctica on October 1, 1998. Source: NASA/Goddard Space Flight Center, Scientific Visualization Studio.

In the same way that the proclamation of the hole was used to mobilize action, its negation became a prize. There must be something about holes that attracts negationists! It might be the linear relation between holes in matter and holes in an argument, a relation highlighted in Irving's words to the judge presiding over his case: "I am going to keep on driving holes in this case until your Lordship appreciates the significance of the holes, or their absence."[22] But a hole is not simply an absence. It is more, not less, information than the matter that surrounds it, be that reinforced concrete or ozone-rich atmosphere. This is because, as we have seen above, and shall explore further in what follows, a hole is information both with regard to the materiality it perforates (concrete/ozone) and to the shape of its absence.[23] It is of course also information in regard to the modes of its capture and representation (aerial photograph/mathematical model).

We shall plunge deeper into our "theory of holes" after looking at other implications of modeling the future.

Predictive Forensics

Predictive forensics is a mode of investigation concerned with evidence of a destruction that has not yet taken place. The evidence is in the future and the future, as we have seen, is the domain of the model. Predictive forensics is now commonly employed in the context of two major and seemingly unrelated fields—environmental science, dealing with the risks associated with planetary-scale climate change, and security analysis, concerned with predicting the risks associated with what used to be known as "the Global War on Terror."

These two fields of practice are of course very different, yet they have some aspects in common. They both seek to manage risk in relation to global but nonlocalized dangers whose containment depends on the preemptive transformation of entire ways of life and the entire depth of space. The securitization of cities and infrastructure is currently the defining feature of contemporary urban design as well as urban life, while radical changes in modes of life on every scale are necessary to mitigate the effects of climate change. While in relation to climate change, too little is actually being done because the industrial lobbies are too strong, in relation to the War on Terror, state mobilization is in a state of overkill, for precisely the same reason.

One of the goals of the current security doctrine is the prediction of risk and the preemptive disruption of its operational networks. One of the prevalent modes of this security management involves "preemptive targeted assassinations"—the killing of individuals whose existence is believed to increase the overall levels of risk. The most common technique currently employed for carrying out targeted assassinations, in some parts of the world, is the use of missiles fired from drones. Many critics consider this campaign of extra-judicial executions to be, as it name suggests, illegal. They are mostly right. Various aspects of these strikes violate different tenets of national laws and International Humanitarian Law. However, the relation of drone strikes to the laws of war is more complex. In fact, when interpreted by state lawyers writing regulations for military and other executive state branches, it is remarkable just how much violence the laws of war enable.

One of the main regulatory principles for targeted assassinations involves a curious temporal inversion. Juridical opinions commissioned by states most frequently employing drones for assassinations—the US and Israel—have authorized their militaries to exercise targeted killing in relation to "imminent threats of violent attack."[24] According to their interpretation of the laws of war, people may be killed not for crimes they have committed in the past—retribution in such cases must be sought through criminal proceedings, requiring states to catch and detain suspects and bring them to trial (a practice both Israel and the US are often reluctant to engage in)—but rather for the attacks these people *will have* committed in the future.[25] What trace does violence that has not yet happened leave "in front"? Predictive forensics—the futurology of contemporary warfare—looks for such traces in the analysis of patterns of behavior and movement in space. It is most commonly frontier zones, areas outside of sovereign control, that are the spaces in which state killing undergoes this type of temporal inversion from dealing with past crimes to addressing future threats.

In these zones, "signature killings" are based on calculations that are not unlike those used in the technical analysis of stock prices, which attempt to predict the future on the basis of patterns of past behavior. With these and related techniques, the contemporary battlefield starts to resemble a field of calculations constituted of risk analysis, pattern recognition, proportionality calculations (how many civilians are likely to die in proportion to the scale or significance of a military target), and, finally, mission assessments. But this economy, just like the financial one on which it is based, has fallen into crisis. Similar to financial derivatives that were invented to mitigate risk but continuously cause it to proliferate—as Gerald Nestler's essay in this book makes clear—military attacks designed to reduce risk end up multiplying it. We must therefore be wary of the risks of risk-mitigation practices themselves.

Drone Frontiers

Drone warfare does not solely rely on technologies of navigation, communication, vision, and munitions delivery. It also depends upon a set of juridical, political, and territorial conditions, which make the logic of the drone campaign far more diffuse than that of a straight line between aircraft and target. The areas currently most intensively under attack by drones—North Waziristan, Gaza, and the remote areas of Yemen and Somalia—are frontier regions. Each of these frontiers has its particular historical, political, and territorial characteristics, each is subject to a different juridical and sovereign arrangement, but all are defined (by their assailants) as areas that are to a lesser or greater degree outside the effective jurisdiction or control of the central government of the state in which they exist. Alleging lack of effective control on the ground, and with it the impossibility of arresting suspects, is what legally enables assassinations. The contemporary frontier is however not only a territorial and a legal condition, it is also a visual one. This is most clearly expressed in Waziristan, the southern part of a region known as the Federally Administered Tribal Areas (FATA). FATA was established as an exceptional zone during the time of the British Raj. The area is now within the borders of the Pakistani state, but state law and effective state control are hard to exercise. The area is largely self-regulated and attempts by the state to exercise control often lead to violent clashes. Exits from and entries to this zone are permitted only to residents and the military.[26] Informal regulations, enforced by both the military and militants, also prevent the bringing in or taking out of electronic paraphernalia including navigation equipment, mobile phones, and cameras. The consequence of

the media siege is that very few images of the damage caused by drone strikes as well as very few eyewitness and survivors' testimonies are available outside of these regions. Together with degrees of legal exception and territorial isolation, this media blackout is an enabling condition of drone warfare. In his essay "Persistent Exception: Pakistani Law and the Drone War," Jacob Burns shows how the exceptional status of FATA has been used in the campaign of drone warfare there, while allowing the US to deny the very existence of the campaign. He shows how in the early years of the campaign Pakistani and US sources misleadingly claimed that reported casualties of drone strikes had in fact died in "bomb-making accidents." Other zones intensively targeted by drone campaigns, such as the rural areas of Yemen and Somalia, are also outside of effective sovereign control, and are similarly hard for nonresidents to approach.[27]

The ability to hide and deny a drone strike is not an insignificant side effect of this technology, but a central part of a campaign that relies to a great extent on secrecy and deniability. The violence inflicted by drone warfare is thus typically compounded by the perpetrators' negation: the violence against people and things redoubled by violence against the evidence that violence has taken place. The media siege limiting documentation and testimonies from the ground is effective because the only other available photographic perspective—that of commercial and publicly available satellite images—is of a resolution in which the damage caused by a drone strike is hardly visible. This has to do not only with the technical resolution of satellite imagery, and the laws that limit it, but with the physical dimension of the architectural damage that these strikes bring about. It is the interaction between these conditions that is important.

Drone missiles of the kind used to target buildings and interior rooms within them are often equipped with a "delay fuse." The few milliseconds between impact and detonation allow the missile to penetrate through a roof and spray its load—hundreds of lethal steel fragments—inside the room (rather than detonating upon impact with the roof and expending the blast force outside). These fragments kill or wound upon contact but usually leave the structure intact. Seen from above, the small hole in the roof is the only visible trace that indicates that the room under it has become an execution chamber. Once more, the forensic problem is that of identifying and imaging a hole in a roof!

The diameter of a hellfire missile—one of the most common types fired by drones—is about 18 cm; other missile sizes do not vary by much. The size of the hole a missile leaves in a roof depends of course on several other factors, such as its material and









Fig. 6. A man is seen through a hole made in his roof by a US drone strike in Damadola, Bajaur region, Pakistan, on January 13, 2006. Photo © Tariq Mahmood/AFP/Getty.

Fig. 7. Home hit by a shell, killing one man and injuring two others. Tuffah, northern Gaza, 2009 Photo © Kent Klich.

Fig. 8. Khuzaa, southeastern Gaza. Photo © Kent Klich, 2009.

Fig. 9. Munitions expert Chris Cobb Smith took this picture standing on the ground floor of the Salha family home in Beit Lahiya, Gaza. Photo: Chris Cobb-Smith/Amnesty International, 2009.

structure, but most are smaller than the 50 cm square that is the size of a single pixel in the resolution to which publicly available satellite images are degraded.[28] The hole is, once again, at the threshold of visibility.

When the figure dissolves into the pixelated ground of the image, it is the conditions that degrade the image, or keep it at a lower resolution, that should be looked at. The pixelation of publicly available satellite images is not the result of visual or optical constraints. Rather they are degraded following legal regulations and directives.[29] The resolution of 50 cm^2/pixel (in which the size of a pixel is half a meter by half a meter) has been chosen as the threshold of visibility because it is aligned with the dimension of the human body. Pixels are monotone surfaces. Their color is determined as an average of all frequencies that the camera sensor detects at the level of the pixel. Half a meter square is the frame within which the human body fits when seen from above. The size of the pixel is designed to mask the body and make it disappear. This is a useful resolution for satellite image providers because they can avoid the risk of privacy infringement lawsuits when recording people on private rooftops or terraces, for example. But the regulation has also a security rationale. Not only do important details of strategic sites get camouflaged in the 50 cm^2/pixel resolution, but the consequences of violence and violations orchestrated by states are likewise veiled. In a further radicalization of the geopolitics of resolution, US satellite image providers make an exception to the fifty centimeter rule in Israel and the Palestinian territories it occupies. An amendment to the US Land Remote Sensing Policy Act, which sets the permitted resolution of the US optical satellites (which currently dominate the market), dictates that these areas—and thus the violations undertaken in them—are shown only in a resolution of 1 m^2/pixel, in which a car is made of 2 pixels and a roof, another common target, is depicted by between 9 and 16 pixels.[30] This snow screen placed over Israel's actions contributed to Turkey's decision, after its conflict with Israel over the Gaza Flotilla—discussed by Maayan Amir in this volume as a "conflict over images and representation"—to send its own image satellite into space and make publicly available 50 cm^2/pixel images of Israel, and this despite the fact that the satellite technology includes Israeli-made optics.

These specifications have direct implications for the documenting of drone attacks. Although at a resolution of 50 cm^2 the general features of individual buildings can be identified, a hole in a roof—the signature of a drone strike—might appear as nothing more than a slight color variation,

Figs. 10–12. The roof of this building in Miran Shah has been hit by a drone-fired missile, but the form of destruction is masked in the photograph's pixelation. Source: DigitalGlobe, March 31, 2012.



a single darker pixel perhaps, in the pixel composition of the image. Even if satellite images close to the time before and after an attack could be obtained, very little difference would be noticed.

The 50 cm^2/pixel satellite imagery thus poses a digital version of the material problem presented by the aerial photographs in the Irving trial (and to some extent by the problem of imaging the hole in the ozone). The historical situations are very different: attempting to exterminate an entire people in gas chambers has nothing in common with a secret and largely illegal assassination war conducted by the US in densely populated civilian areas. Nevertheless, in both these cases, the hole in the roof is the indication that the room under it was a site of execution, and in all these cases the evidence—a hole—is at the threshold of detectability of the images in which they are captured or represented.

We do not know the precise optical specifications of contemporary drone vision; what we do know from the testimony of former drone operators is that people could be seen but not positively identified, and that spades could be mistaken for guns.[31] But identifying the human body is the very purpose of drone vision, whose function is ultimately the targeting of individuals. Drone warfare is about the human figure, and this is, as we have seen, precisely the opposite of what publicly available satellite images are designed to offer. It seems that the trajectory of research traversed by Forensic Architecture has led back to the individual figure. Drone strikes are executed at a significantly higher resolution than the one at which the damage they create can be captured in satellite photographs. This fact inverts one of the foundational principles of forensics, namely that the crime's investigator should be able to see more, using better optics or in better resolution, than the perpetrators of the crime. This inversion is derived from a more fundamental one: usually it is state agencies that investigate individuals or criminal organizations, which is why the better resources and optics are on the side of the investigators. In our case, however, it is state agencies that do the killings and independent organizations the forensics. The differential in knowledge, embodied in the gap between the resolution in which attacks are undertaken and the resolution at which they can be investigated, is the space of denial.

This manipulation of the field of vision enables a form of denial that is different from the forms presented earlier in this essay. To say: "This is untrue," or "This did not happen," or "This will not happen" is to add information to the public domain. The formulation that the US employs—officially sanctioned as the "Glomar response"—is a form of denial that aims to add no information whatsoever to the public domain.[32] Under its terms, US state agencies are authorized to "neither confirm nor deny the existence or nonexistence" of documents requested under the Freedom of Information Act, and thus to "neither confirm nor deny" the existence—or nonexistence—of a secret war of assassination in Pakistan.[33] But "glomarization" is also an intervention in the field of vision: when the traces of destruction are too small to be represented in the resolution of publicly available satellite images, it is the satellite image itself that can neither confirm nor deny the existence or nonexistence of, for example, holes in roofs that would otherwise constitute evidence of state-sanctioned violence. Chris Woods, in an essay in this volume, explores the absurd logic of hiding a known secret. In this context, denial functions as a manifestation of the power of the state to inflict violence and to deny its consequences. But the glomarization of drone warfare is not simply a rhetorical act sanctioned by executive orders; it is made possible by the production of a territorial, juridical, and visual reality—the formative conditions of the contemporary frontier.

Return to the Witness

Forensic Architecture (a team including Susan Schuppli as coordinator, Jacob Burns, Steffen Krämer, Francesco Sebregondi, Chris Cobb-Smith, Reiner Beelitz, Samir Harb, and Blake Fisher, in collaboration with SITU Research) has been involved, together with and on behalf of various organizations, including the UN Special Rapporteur on Counter Terrorism and Human Rights, in trying to gather architectural evidence for several drone strikes in Pakistan, Yemen, and Gaza.[34] Without the possibility of traveling to the sites of the strikes, and with the images available to us degraded to a considerably lower resolution than those in the archives of the state agencies pursuing this campaign, we turned to witness testimonies. This was not simply a return to the aural dimension of victim testimonies, as conceptualized during the "era of the witness": rather, the mode of engagement with testimonies that follows the "forensic turn" involves their enhancement and entanglement with different techniques and technologies of interpretation, most of them spatial.

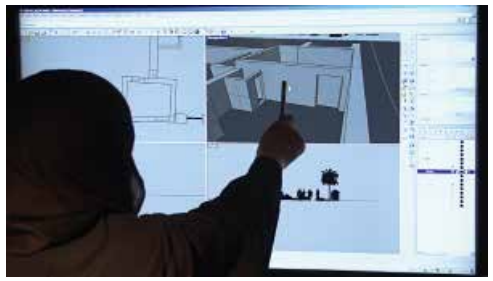
The testimonies we obtained are reproduced in the drone investigation section of this book. Here, I would like to present some reflections in relation to two of the five cases we have investigated. The first is an investigation based upon an aural deposition of a survivor of a drone strike and the other is based on the interpretation of a video testimony shot using a handheld apparatus (most likely a mobile phone) in the aftermath of another strike. Both these testimonies were delivered in relation to strikes in FATA, and both were ruptured or incomplete. The memory of the witness was interrupted by the subjective experience of extreme violence while the video testimony registered the rushed movements of a videographer who felt himself in danger. Both witness and the video file had to make a perilous path across the siege lines of Waziristan before the testimony they recorded could be publicly disseminated.

The witness was a German woman who was in her home in Mir Ali, North Waziristan, when it was hit by a strike in October 2010 that killed five people. After the attack, she made her way back to Germany. There she

delivered her testimony to a human rights organization and in the media, but some of the details of the attack were obscured from her memory. Based on her step-by-step instructions, we constructed a detailed computer model of her house that included all rooms, furniture, and objects she could remember.

The process of model building was instructive. Through it, the witness recalled previously forgotten details. Many architectural details brought back fragments of memory from the life in this house and also from the strike itself. When the digital model was complete, we rendered it in such a way that we could undertake a virtual walk through the reconstruction twenty-four hours before and after the strike. Walking within the virtual model, the witness could "return" to the space and time of the strike, recollecting and recounting some of the realities of life and death under drones from the previously rarely available perspective of its victims. Elements encountered in this reconstruction included children's toys and a child's walker in the open courtyard—which one might have thought would indicate to a drone operator that children were on the premises. There was also, significantly, a fan, to which I shall return later.





Figs. 13, 14. A process of computer modeling of the site and event of the strike in Mir Ali on October 4, 2010. See case study no. 2 in "Case: Drones Strikes."

Unlike in our other investigations, here architecture did not figure materially as evidence. We had no ruins to study, measure, and on which to base a reconstruction; rather, we reconstructed the architecture out of testimony. We used the digital model of the house as a way of helping enhance and organize the memory of a violent event.

This investigation drew its inspiration from what historian Frances Yates called the "art of memory." In her magnum opus about the classical and medieval tradition of mnemonic techniques, Yates emphasized the relationship between memory, architecture, and destruction.[35] The invention of the art of memory was attributed by Cicero and others to the Greek poet Simonides: he had just walked out of a banquet hall full of people when the roof collapsed, killing everyone inside. The bodies could not be identified, but Simonides was able to reconstruct the flow of conversation between the guests around the table and thus remember where each guest had been sitting and identify the bodies, which could then be returned to their families for burial. The mnemonic techniques of the art of memory, attributed to this experience, have since reserved a special place for architecture as a medium for establishing relations between people, places and things.





Figs. 15, 16. The witness points to the location of the fan in the model. See case study no. 2, Mir Ali, North Waziristan, in "Case: Drones Strikes."

The technique, made famous by the rhetoricians and orators of antiquity like Cicero and Quintilian, advised orators tasked with remembering long and complex speeches to commit the spatial arrangement of known buildings to their memory or to mentally construct new ones. Every room in these buildings was to be furnished with objects relating to the issues that the orator needed to bring up—a fountain (perhaps a naval battle), a dagger (a murder), a plant (nature), a bed (perhaps a love affair). In delivering the speech, the speaker would imagine walking through the building, passing through corridors, traversing courtyards, opening and closing doors, encountering objects, and in this way navigating the different issues and ideas. The same building could be used for different speeches. All that was necessary was to remove one set of objects and bring in new ones, then "walk" through the building again. But the technique also posed another problem, not dealt with by Yates. Just like in other attempts at material or digital erasure, the objects arranged in the rooms could not be fully removed however many times they were dragged out. French poet Jacques Roubaud has described the way objects would reappear in the context of the wrong speeches, haunting the building or specific rooms within it.[36] When buildings become too cluttered with the ghosts of such objects, they must be abandoned or destroyed. This reveals another layer of the complexity by which architecture and memory intersect with violence and destruction; and also of the importance of forgetting, a task considerably more difficult than that of remembering, but nevertheless one on which memory depends.

One object in particular was important to the witness from Mir Ali. It was a freestanding fan that stood in the small courtyard that mostly served the women and children. When building the model, the witness seemed uneasy about it, repeatedly adjusting its location. Later, when "walking" through the model in the digital aftermath of the strike, she mentioned seeing human flesh on the fan's blades, which she collected for burial. The fan is a media form, retaining and transferring a traumatic event.

While the above testimony revealed something of the complexity of memory's relation to violence and architecture, the second testimony I would like to discuss dealt with information saturated in a piece of video footage. The video in question was shot in the aftermath of a March 2012 drone strike in Miranshah, North Waziristan, in which four people were killed. It was a rare piece of footage, one of very few videos documenting a site destroyed by a drone strike.[37] It was smuggled out of Waziristan and passed from hand to hand before arriving at the desk of Amna Nawaz, NBC Pakistan Bureau Chief in Islamabad. When the video was broadcast



Fig. 17. The interior courtyard with the fan and the child walker modeled and rendered according to the description of the witness. See case study no. 2, Mir Ali, North Waziristan, in "Case: Drones Strikes."

its contents were understood to show nothing more than an indistinct ruin. There was, however, much information saturated within the blurry footage.

The first thing that the study of the video revealed was not about the ruin but rather about the videographer recording it. The ruin was video-captured from a window of a higher building overlooking it. The interior of the room occupies a large part of the video frame. But the capturing of the darkness inside the room, the window frame, the hasty camera movements around the opening, the slanted and blurry sequences, were not irrelevant information: they rather indicated that the videographer was recording from a certain depth inside the room, being careful not to come too close to the window, or to be seen above the sill.[38] The video thus captured an important thing: the state of mind of the videographer, a sense of danger. There could be several reasons for the videographer to feel it was dangerous to be seen filming the aftermath of a drone attack. Local militants sometimes prohibit documentation of sites of attack and might have considered the videographer to be a spy; or the videographer might have been worried about US drones watching overhead, as they do in the aftermath of some strikes, sometimes firing at the same place again after more people have gathered.



Fig. 18. Still from footage broadcast on MSNBC showing the aftermath of a March 30, 2012, drone strike in Miranshah, Pakistan. The danger to the cameraman can be deduced from the size of the dark interior of the room seen on both sides of the frame. They indicate that the videographer stood deep inside the room in order not to be visible as he filmed. See case study no. 3 in "Case: Drone Strikes."

The video thus initially depicted two rooms, each functioning as a recording device of sorts: the room from whose window the first part of the video was shot, and the room within the ruin in which people were killed. A later sequence within the video depicted the interior of another empty room. The videographer had evidently descended from the higher building and entered the ruin itself. The interior space seemed structurally intact but for a small hole at the center of the ceiling.



Fig 19. A still from the same video showing the entry hole of a missile through the ceiling of a room. By analyzing the video, we learn that the hole is less than 50 cm², and therefore below the threshold of detectability in a satellite image. See case study no. 3 in "Case: Drone Strikes."

It was a hole of the kind that is caused by the entry of a drone missile, smaller than each of the 50 cm² pixels that compose the satellite image of the roof, and thus invisible in it. While the window was the relevant aperture in the "videographer's room" (it was the position of the window frame in the image that indicated the danger) the hole in the ceiling was the relevant aperture in the "targeted room." It was through this hole that the blast force of the missile entered. The room's interior walls were clearly dotted with hundreds of small fragments. A careful examination of these fragments revealed two distinctly shaped gaps within their otherwise even distribution on the wall. Although we cannot be sure, these could be the outlines of the people that died in the blast. If so, their bodies absorbed the fragments and left their "shadows" on the wall behind. The room's walls thus functioned as something akin to a photograph, exposed to the blast in a similar way to which a negative is exposed to light, just as the remains of bodies created voids in the ash layer over Pompeii, or as a nuclear blast famously etched a "human shadow" on to the steps outside the Sumitomo bank in Hiroshima. Combining pathology and forensic architecture, the traces of dead bodies seem to have become part of the architecture.

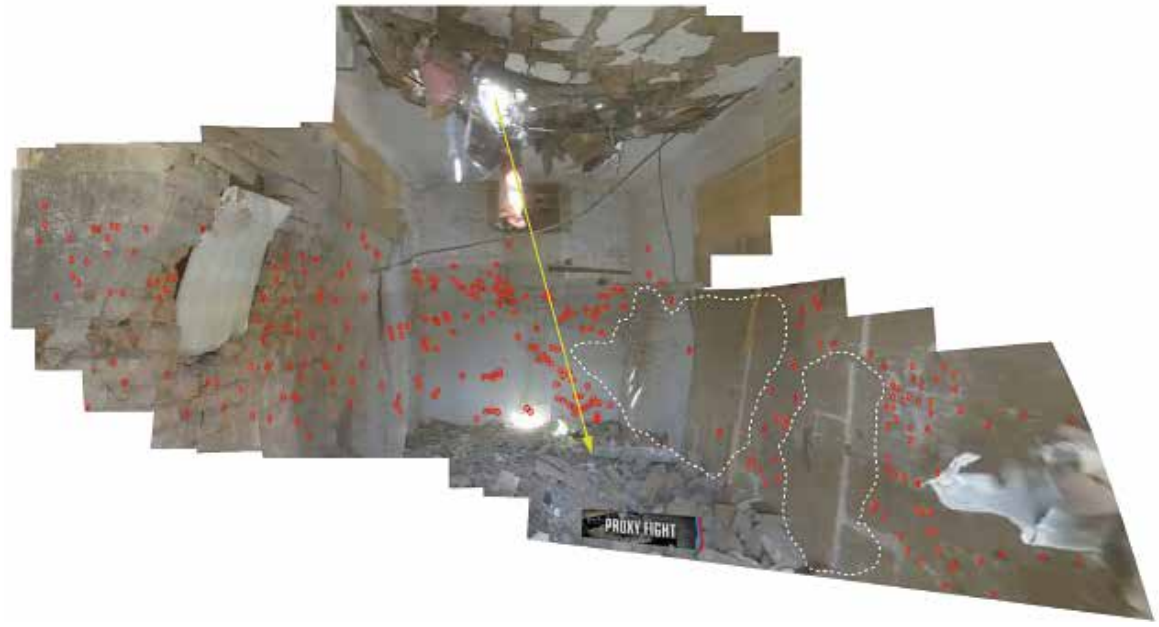


Fig. 20. A montage made from footage of the interior of the room. By mapping the marks missile fragments made on the walls, we discovered areas where they are absent—probably absorbed by bodies present in the room at the time of the strike.

Both testimonies were enhanced using architectural methodologies, though in very different ways. In the first, a model of a building was the means of assembling and reconstructing the memory of a violent event; in the second, our analysis treated the building as a recording device on which the bodies of victims were imprinted. Both had the potential to confront state-sponsored denial with the moral force of firsthand experience. Both offered only faint signals, flashes of memory in the context of a war that is still largely unknown. Bringing those fragments to public knowledge is no guarantee of public action, let alone of stopping the campaign. For this to happen, mobilization around these traces, perseverance, and will are necessary.

*

These acts of bearing witness also had another important element in common: they involved taking risk. In order to be made public both the witness and the video had to make an indeterminate path out of a frontier zone under siege. To a certain extent, both these testimonies exemplified the power of *parrhesia*—a term that in ancient Greek literally meant "to speak everything" and in ancient Hebrew evolved to mean "in face of the public." These two meanings of the term each designate an aspect of the practice of forensis.

In a series of lectures titled "fearless speech" that Michel Foucault delivered shortly before his death, he used and further developed the concept of parrhesia as the courage to risk one's life in order to speak an unpopular truth. Parrhesia, Foucault explained, is a form of criticism articulated "in a situation where the speaker or confessor is in a position of inferiority with respect to the interlocutor. The parrhesiastes is always less powerful than the one with whom he or she speaks. The parrhesia comes from 'below', as it were, and is directed towards 'above'." The parrhesiastes, he continued, choses to speak the truth to those who try to hide, deny, or cannot accept it. Parrhesia, then, "demands the courage to speak the truth in spite of some danger. And in its extreme form, telling the truth takes place in the 'game' of life or death."[39]

It is remarkable how relevant this practice is to these cases before us. As testimonies that involve risk and the moral courage to confront sovereign violence and its denial, these acts of parrhesia pose the most fundamental ethical and conceptual challenge to the aesthetic-political practice that in this book we refer to as forensis.

1 The book in question was Deborah E. Lipstadt, *Denying the Holocaust: The Growing Assault on Truth and Memory* (New York: Free Press, 1993). The book was republished in the United Kingdom in 1994 by Plume, a division of Penguin—whom Irving sued. *Denying the Holocaust* accused Irving of deliberately misrepresenting evidence to conform to his ideological viewpoint. English libel law puts the burden of proof on the defense, meaning that it was up to Lipstadt and her publisher to prove that her claims were substantially true.

2 Robert Jan van Pelt's expert report submitted to court in the David Irving trial is a foundational document in the history of forensic architecture. An extended version of this report was republished in Robert Jan van Pelt, *The Case for Auschwitz: Evidence from the Irving Trial* (Bloomington: Indiana University Press, 2002).

3 Trial Transcript, Day 10, at 20 (Jan. 26, 2000), *Irving*, 2000 WL 362478, available at http://www.fpp.co.uk/Legal/Penguin/transcripts/day010.htm.

4 Trial Transcript, Day 11, at 129 (Jan. 27, 2000), *Irving*, 2000 WL 362478, available at, http://www.fpp.co.uk/Legal/Penguin/transcripts/day011.htm.

5 Van Pelt, *The Case*, 2–3.

6 Trial Transcript, Day 11, at 150 (Jan. 27, 2000), *Irving*, 2000 WL 362478, available at, http://www.fpp.co.uk/Legal/Penguin/transcripts/day011.htm.

7 Van Pelt, *The Case*, 3ff., 24ff., and 458ff.

8 One of the main such proponents was a Paris-based bookshop and publishing house called La Vieille Taupe, which became renowned in the 1980s for publishing anti-Semitic and Holocaust-denial literature.

9 Eyal Weizman, *The Least of All Possible Evils: Humanitarianism from Arendt to Gaza* (London: Verso, 2012), 38.

10 Robert Faurisson, "A Challenge to David Irving," Institute for Historical Review, http://www.ihr.org/jhr/v05/v05p289_Faurisson.html, last accessed December 2013.

11 This occurred on April 25, 1983; *Stern*'s largest competitor, the *Bild Zeitung*, smuggled Irving into *Stern*'s press conference to announce the discovery. See van Pelt, *The Case*, 21.

12 Irving also presented a dubious laboratory report penned by Fred Leuchter, a former US penal system execution specialist, that claimed that the chemical composition of randomly chiseled-out and pulverized building remains he stole from a gas chamber did not have the cyanide contents he would have expected to find in a US-operated execution gas chamber. See the film by Errol Morris, *Mr. Death: The Rise and Fall of Fred A. Leuchter, Jr.* (USA, 2000), 91 min.

13 Dino A. Brugioni and Robert G. Poirer, "The Holocaust Revisited: A Retrospective Analysis of the Auschwitz-Birkenau Extermination Complex," February 1979, http://www.globalsecurity.org/intell/library/imint/holocaust.html. The authors analyze reconnaissance images shot in the spring and summer of 1944, specifically on April 4, May 31, June 26, August 25, and September 13. Irving was referring to the following study: John C. Ball, "Air Photo Evidence," http://www.whale.to/b/ball.html. See van Pelt, *The Case*, 56.

14 Van Pelt, *The Case*, 84 and 353.

15 This might be similar to what Alfred North Whitehead called "nonsensuous perception," with which matter has a direct, nonsensuous sense of duration in form. A. N. Whitehead, *Adventures of Ideas* (New York: Macmillan, 1933), 233–34.

16 See also Debórah Dwork and Robert Jan van Pelt, *Auschwitz, 1270 to the Present: A History* (New York: W. W. Norton & Company, 2002); Robert Jan van Pelt, *Architectural Principles in the Age of Historicism* (New Haven, CT: Yale University Press, 1993).

17 Nabil Ahmed's essay in this volume makes this point in relation to the way Victorian domestic environments became toxic with arsenic.

18 Thanks to Adrian Lahoud for his advice.

19 *Scientific Integrity and Public Trust: The Science behind Federal Policies and Mandates: Case Study 1-Stratospheric Ozone: Myths and Realities; Hearing before the Subcommittee of Energy and Environment of the Committee on Science; U.S. House of Representatives* (Washington, DC: US Government Printing Office, 1996), https://openlibrary.org/books/OL573428M/Scientific_integrity_and_public_trust.

20 Seth Denizen, "Three Holes in the Geological Present," in *Architecture in the Anthropocene: Encounters among Design, Deep Time, Science and Philosophy*, ed. Etienne Turpin (Ann Arbor, MI: Open Humanities Press, 2013), 33.

21 Jonathan Shanklin, "Reflections on the Ozone Hole," *Nature* 465 (May 2010): 34–35. Quoted in Denizen, "Three Holes," 34.

22 Trial Transcript, Day 10, at 145 (Jan. 26, 2000), Irving, 2000 WL 362478, available at http://www.fpp.co.uk/Legal/Penguin/transcripts/day010.htm.

23 Thanks to Susan Schuppli for her advice.

24 The operative concept in regulating this temporal inversion is that of "imminence," which means "instant, overwhelming, leaving no choice and no moment for deliberation." But the temporality of imminence becomes elastic, gradually pushed back by a series of qualifying formulations such as "risk of imminent harm," "threat imminent of violent attack," "continuing and imminent threat." Imminence, as Jameel Jaffer from the ACLU puts it, "is no longer a concept that implies the coming of a specific event—instead […] it is now more equivalent to menace: amorphous and undefined." Jameel Jaffer, "The Justice Department's White Paper on Targeted Killing," *ACLU Blog of Rights*, February 2013, https://www.aclu.org/blog/national-security/justice-departments-white-paper-targeted-killing, last accessed August 30, 2013.

25 John Brennan has put it this way: "We're not carrying out these actions to retaliate for past transgressions. We are not a court, we're not trying to determine guilt or innocence, and then carry out a strike in retaliation." John Brennan, *The Efficacy and Ethics of U.S. Counterterrorism Strategy* (The Wilson Centre, April 30, 2012), http://www.wilsoncenter.org/event/the-efficacy-and-ethics-us-counterterrorism-strategy.

26 The Federally Administered Tribal Areas are officially a "Prohibited Area" which nonresidents require special permission to enter. A complete list of Prohibited Areas can be found in Ministry of Foreign Affairs (Pakistan), "Protocol (II) Section, Description of 'Open' and 'Prohibited Areas' (Annexure I)," January 6, 2011, http://www.pakresponse.info/Portals/0/Policy/List%20of%20Updated%20Open%20and%20Prohibited%20Areas%20in%20Pakistan%20-%20%206%20January%202011.pdf.

27 American security think tank RAND describes their work

on ungoverned territories as an "analytical *terra incognita*." Rand Corporation (Angel Rabasa, Steven Boraz, Peter Chalk, Kim Cragin, Theodore W. Karasik, Jennifer D. P. Moroney, Kevin A. O'Brien, and John E. Peters), *Ungoverned Territories: Understanding and Reducing Terrorism Risks* (Rand Corporation, 2007), http://www.rand.org/content/dam/rand/pubs/monographs/2007/RAND_MG561.pdf.

28 Telephone conversation with Lars Bromley (Principal Analyst and Research Advisor, Human Rights and Security at the UN Institute for Training and Research UNITAR and Operational Satellite Applications Programme UNOSAT), January 28, 2013.

29 See for example the US 1998 Land Remote Sensing Policy Act, http://geo.arc.nasa.gov/sge/landsat/15USCch82.html.

30 In one-meter resolution a typical house would take up about twelve pixels. This poses a serious problem for satellite investigations of Israeli attacks in Gaza, given that a bomb-damaged building would not look much different from a building that is still intact. On the politics surrounding the Turkish satellite, see William Fenton, *Why Google Earth Pixelates Israel*, http://www.pcmag.com/article2/0,2817,2386907,00.asp. On the Kyl-Bingaman Amendment, which amounts to a "Prohibition on Collection and release of Detailed Satellite Imagery Relating to Israel," see http://www.nesdis.noaa.gov/CRSRA/files/Imager%20Restriction%20over%20Israel.pdf; and Stefan Geens, "Whither high-resolution satellite imagery of Israel?," Ogle Earth, June 15, 2011, http://ogleearth.com/2011/06/whither-high-resolution-satellite-imagery-of-israel/, both last accessed September 26, 2013.

31 Heather Linebaugh, "I worked on the US drone program. The public should know what really goes on," *Guardian*, December 29, 2013.

32 State agencies may make use of the Glomar response only when they are dealing with information that is "specifically authorized under criteria established by an executive order to be kept secret in the interest of national defense or foreign policy." Public Law 89-487, JULY 4, 1966, (e) (1), 251, http://www.gpo.gov/fdsys/pkg/STATUTE-80/pdf/STATUTE-80-Pg250.pdf, last accessed January 2014.

33 The Freedom of Information Act (FOIA) was signed into law on July 4, 1966, and took effect a year later. It means that any person has the right, enforceable in a court of law, to request and receive access to records from any federal agency, so long as those records are not subject to exemption from release, for example because of national security concerns. The Glomar response usually quotes relevant exceptions to Freedom of Information Acts as "Exemptions One, Three and Five, 5 U.S.C. § 552(b)(1), (3) and (5)."

34 Following the principles of forensis we have undertaken this investigation for various types of forum: there was of course no existing court with jurisdiction over this matter. The US is not a signatory of the Rome Statute and is thus not subject to rulings by the International Criminal Court (ICC). We have provided evidential reports in the following contexts: legal action brought by Pakistani lawyer Shahzad Akhbar in the UK Court of Appeal, regarding UK involvement in the form of providing intelligence on targets to the US; an international investigation by the UN Special Rapporteur on Counter Terrorism and Human Rights (presented at a side event of the UN General Assembly in New York); and journalistic investigations with the Bureau of Investigative Journalism.

35 Frances Yates, *The Art of Memory* (London: Pimlico, 1992).

36 Jacques Roubaud, "Mnenomic Hand," presentation at "Memory Marathon," The Serpentine Gallery, October 12–14, 2012, http://vimeo.com/61611210.

37 Rachel Maddow, "Victims of secretive US drone strikes gain voice in Pakistani lawyer," MSNBC, June 29, 2012, http://video.msnbc.msn.com/rachel-maddow/48022434#48022434.

38 This account is inspired by reading Georges Didi-Huberman, *Images in Spite of All: Four Photographs from Auschwitz*, trans. Shane B. Lillis (Chicago: University of Chicago Press, 2012).

39 Michel Foucault, *Fearless Speech*, trans. Joseph Pearson (New York: Semiotext(e), 2001), 15–16; and Michel Foucault, *The Courage of Truth*, trans. Graham Burchell (New York: Palgrave Macmillan, 2011).

Uneasy Listening

Susan Schuppli



Fig. 1. Photo: Win McNamee/Getty Images, June 22, 2010.

These drones hover over our heads constantly and one can always hear the buzzing, mosquito-like sound they make.

The constant noise from drones has driven many villagers to insanity. When I hear a loud noise now, I am very frightened that a drone strike is happening and I live in this constant fear.

— Survivors of a drone strike in Datta Khel, FATA Pakistan, March 17, 2011[1]

The origin of the term "drone," as used to describe unmanned aerial vehicles (UAVs), refers not to the buzzing insect-like sound emitted by their whirring propellers while airborne, as is commonly assumed, but rather to their mimetic resemblance to the male honeybee, a stingless insect possessing dark tail striping. During World War II, radio-controlled aircraft were used as air targets for training anti-aircraft gun crews as well as for collecting data on scientific missions. These early pilotless planes were painted with black markings along their fuselage, hence their visual designation as drones.

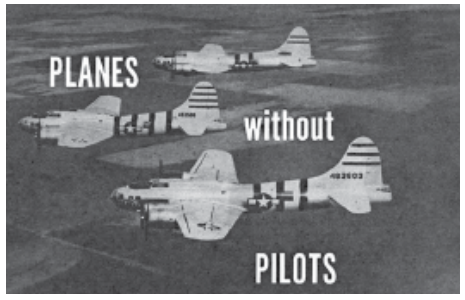


Fig. 2. "Planes without Pilots." Three radio-controlled B-17G-90-DL Flying Fortress drone aircraft in flight, probably out of Eglin Field, Florida, United States, August 6, 1946. The image caption reads: "They've [drones] been clay pigeons in gunnery practice, bombed Jap and German targets, and brought back data from the heart of Bikini's cloud. Uncle Sam's radio-controlled planes have missions in mind never remotely guessed at by Jules Verne." Source: *Air Trails* (February 1952). Collection of Bob Harmon.

The widespread misinterpretation of the contemporary drone's etymological origins as derivative of the high-pitched noise of a bee in flight is today still further removed from the creature's scientific classification within the *Apoidea* family of the *Insecta* class; a change in function that the image caption to the right also prophetically invokes. While the drone bee is a stingless flying organism whose main role is to assist in species reproduction, contemporary remote-controlled drones have become increasingly lethal and thus are surely no longer conceptually descendant from the harmless *Apoidea* line, but rather from the predatory species of the *Reduviid* family—that of assassin bugs.

As US strategies around the War on Terror shifted from the use of secret prisons and detention camps to targeted assassination under the Obama administration in 2009, Predator and Reaper drones have come to saturate the airspace over the Federally Administered Tribal Areas (FATA) of Northwest Pakistan.[2] These armed drones troll the topographies of FATA in search of targets whose names are provided by the weekly Kill List (or what Obama rebranded a "disposition matrix" in 2011) compiled on infamous "Terror Tuesdays" at the White House.[3] Their ubiquitous presence, signaled by high-frequency emissions, has become a permanent feature of the skies along the Afghan border. Although various organizations, most notably the Bureau of Investigative Journalism, based in the UK, try to maintain comprehensive datasets of reported casualties (fatalities and injuries) from drone strikes in Pakistan, these numbers do not begin to represent the injurious nature of what it means to live under the constant sonic menace of drones.

In the absence of data documenting the actual numbers of drone missions flown over Pakistan it is useful to extrapolate from similar data collected in Afghanistan to get a sense of the general ratio between sorties and strikes; this calculation indicates that for every thirty armed drone sorties flown only one actual strike results. If the ratio of sorties to strikes in FATA is roughly equivalent, the number of drone sorties conducted over FATA during the Obama years from January 2009 to June 2013 may have already reached around 9,500.[4] This staggering figure is further underscored by the fact that these flights are not short missions that traverse sovereign Pakistani airspace in search of targets and then head directly back to their Kandahar airbase in southern Afghanistan. On the contrary, these are extended sorties that track moving vehicles, loiter over villages and towns, and target adversaries for up to two days at a time without returning to refuel. The current generation of armed Reaper drones carry nearly two tons of fuel in addition to an equal payload of equipment, allowing them to stay airborne for around forty-two hours, or fourteen hours when fully loaded. This puts the figure of Obama-era drone hours flown over FATA, a geographical region of 27,220 km^2, at between 133,000 and 399,000 hours, if flight patterns are somewhat analogous to those in Afghanistan. Plans are currently underway to increase these capacities dramatically, so that in the future non-hydrocarbon-reliant drones may well be able to scour inaccessible regions of the globe for months on end without refueling.[5] The density of armed drone surveillance is also much higher in the towns of Miranshah and Mir Ali, where virtually around-the-clock drone surveillance is being reported. An altogether different dimension of the War on Terror and its impacts upon civilian life on the ground would emerge if flight logs documenting the hours that drones spend cruising the skies of FATA were made public. A survivor of a drone strike interviewed by Forensic Architecture recalled the near-continuous presence of drones in Mir Ali: "I have actually heard drones fly day and night and during the day have also seen them. At night, they were very loud, a kind of roar, as they flew much lower than during the day. Sometimes there were breaks of one hour, but then they came back."[6]



Fig. 3. Assassin bug. Source: Fir0002/Flagstaffotos/ Creative Commons.



Fig. 4. MQ-9 Reaper in flight. Photo: U.S. Air Force photo/Staff Sgt. Brian Ferguson/ USAF Photographic Archives, 2007.

Although extremely difficult to confirm definitively in many areas of the world where they occur (most notably in Pakistan, Afghanistan, Yemen, Gaza, and Somalia), statistics reporting deaths caused by drone strikes do enable a certain degree of quantitative insight—even when exact numbers are at times inconsistent between accounts.[7] For example, it was reported that upwards of forty people were killed in a drone strike on a Tribal Jirga held March 17, 2011, in the village of Datta Khel, North Waziristan. While the estimated figure ranged from forty-two to fifty-three killed and fourteen injured, there is no doubt that a large number of people died from the Hellfire missiles fired by a drone that day.[8] However, far greater numbers of people are psychologically affected by the relentless coverage of US drone surveillance in this area, a military presence that is primarily experienced as a sonic threat in which invisible sound frequencies are converted into states of anxiety, depression, and fear. This daily lived terror—the fear of an imminent deadly attack by a remote-controlled killing machine that one cannot so much see as hear—is difficult to measure, making it extremely challenging to represent in graphs and statistics; whereas a body that is killed or injured is unequivocally real. "They are like a mosquito. Even when you don't see them, you can hear them, you know they are there."[9] The absence of a comprehensive analysis of drone sonics within the public record is notable, especially given its chronic, albeit not directly fatal, impact upon civilian populations in regions such as FATA. The slow

violence of this facet of drone surveillance and its related lethal operations raises a significant challenge to statisticians who are today increasingly faced with the task of accounting for the collateral effects of conflict as they bear not only upon issues of food production, water supply, and treatment, and other aspects of infrastructure damage linked to mortality, but also upon vulnerabilities related to mental health. "The sound alone gives us psychological grief," said Kaleemullah Mehsud, a man in his thirties from Waziristan, who spoke to Agence France-Presse in Peshawar.[10]

I began this discussion with a brief clarification that the use of the term "drone" came about as the result of a visual schema rather than by acoustic filiation, as is most often presumed.[11] However, this etymological confusion involves a reordering of vision and sound that is, I argue, folded into the very political reorganization of drone warfare taking place today, with its attendant claims regarding the minimal impact of unmanned aerial violence upon civilian life. Drone vision is arguably precise, but drone sonics are vague and diffused, producing a difference in both degree and kind of injury. While the targeting accuracy of Predator and Reaper drones is conjoined to their ability to send almost instantaneous information back to operators who observe terrestrial life in FATA on screens sometimes thousands of kilometers away, their sonic impact is dispersed across village populations, and ranges in volume from debilitating to benign levels, depending upon the aerial proximity of the drone and the varying acoustic properties and contours of the ground, which affect the manner in which sound waves are absorbed and bounced around.[12] The high-pitched frequencies of a drone sortie register independently of an actual decision to strike, creating a blanket of continuous noise whose harm reorganizes the corporeal field of perception. When a strike does occur, the deafening blast and kinetic impact of a Hellfire missile has been known to cause permanent hearing damage and loss. In the words of one witness: "I also suffer from a hearing problem because the sound when the missile landed was so loud. … I will never forget the sound the missile made when it was fired on the building where we were meeting. It was a very loud and severe sound."[13] The objective of drone surveillance is directed towards a vertical event—a laser-guided missile strike—whereas the by-product of such drone vision manifests itself as a horizontal distribution of acoustic emissions at varying intensities of amplification, resulting in psychological distress, more so than physical injury.

Omnipresent drone surveillance in towns such as Miranshah and Mir Ali has created a background stratum of buzzing sound, which is now a permanent feature of these environments. When a Hellfire missile attack suddenly emerges out of this atmospheric "drone," it temporarily reorganizes both sound and vision, as the impact is converted into a penetrating acoustic singularity and the visual field redistributed through the violent disarticulation of bodies and buildings that begin to merge with ground. From the drone operator's point of view, this reorganization is made all the more chillingly explicit when the target—a human body—slowly "bleeds out on screen." After an attack, the thermal image of the drone operator's televisual interface fuses figure and ground in an indistinguishable monochromatic field of pixels, as hot blood cools to the temperature of the terrain, thus transforming discrete visual data into a kind of amorphous background noise. "The guy that was running forward, he's missing his right leg. And I watch this guy bleed out and, I mean, the blood is hot. As the man died his body grew cold, and his thermal image changed until he became the same color as the ground. I can see every little pixel, if I just close my eyes."[14] The planar field of drone vision captured by surveillance sensors is thus converted, at the transition between life and death, into a diffused horizontal data-stream reminiscent, in that moment, of the spatial dispersion of acoustic data.

Primarily at stake in this discussion is an examination of the sonic dimension of such remote-controlled warfare, which has received only scant mention in comparison to the many contemporary theorizations of the lethal vision of drone technology. This deficit persists in spite of the fact that accounts of the sonic menace of drone sorties feature as a consistent component of witness testimony. It is perhaps ironic that current acoustic research into reducing the noise footprint of unmanned aerial vehicles, in order to increase their covert capacities as they engage in low altitude surveillance and military missions, might well contribute to an overall reduction in noise generation by drones. This is not to say that their impact upon civilian life will necessarily be diminished, but, rather, that the role of sound as source of anxiety and fear may lessen.[15] Controlling the acoustic signature of a drone has become part of a growing specialist field of aeroacoustics that tries to identify, measure, and classify the acoustic signal propagation characteristics of propeller aircraft in real time using digital-signal-processing hardware and advanced computational algorithms.[16] Efforts to control and reduce the sound emissions generated by engine exhaust and spinning propellers has primarily been directed towards increasing the stealth capacities of drones, although it is also intended to prevent accidents. In the increasingly congested airspace over the Afghan/Pakistan border region, collisions with other aircraft have been inevitable, in spite of advanced detection systems. In August 2012 a drone collided with a C-130 cargo plane, forcing an emergency landing.[17] Silencing a UAV's acoustic signature would safeguard against its own operational noise being fed back into its acoustic sensors, thus enhancing its ability to differentiate between externally generated sounds and itself. Currently, drones use infrared and radar sensors to avoid detection. Improving the acoustic sensor arrays of UAVs would aid in situational awareness and "perimeter defense" against other small low-flying aircraft and anti-aircraft missiles.

Drones are engineered into highly integrated technological systems, which makes it extremely difficult to separate and classify the various noise-producing components that comprise their sonic signature. Atmospheric and meteorological conditions can also actively modify the sonic signature of a UAV. As sound waves radiate outwards from the drone they

interact with natural phenomena in the air, producing new "mixed" frequencies and further complicate the task of assigning a definitive acoustic signature to a given drone model, since the identification and classification of sound is done by detection devices/microphones external to the machine. Because a significant aspect of a drone's surveillance operations is to monitor ground noise using its on-board sensors, reducing a UAV's acoustic identity would help to ensure that its own sounds don't interfere with the task of monitoring sounds originating from the ground. As research and development in aeroacoustics progresses to silence the drone, will a reduction in noise lessen the anxiety and fear that populations in FATA now experience living under drones, or will the prospect of an omnipresent and lethal payload that one can neither see nor hear induce an even greater degree of fear and trauma?

The relative disregard paid to the damaging effects of living under the soundscape of drone surveillance is understandable given the limited resources and restricted access of human rights investigators and legal practitioners into a region such as FATA who rightly focus on the lethal outcomes of actual drone strikes. However, one significant attempt to address this neglect is represented by the coauthored 2012 Stanford & NYU report, "Living Under Drones: Death, Injury, and Trauma to Civilians from US Drone Practices in Pakistan," which collected numerous firsthand accounts of the debilitating effects of living with the constant sound of drones buzzing overhead, from the impact on mental health to the effect on social community activities.

> One man described the reaction to the sound of the drones as "a wave of terror" coming over the community. "Children, grown-up people, women, they are terrified. … They scream in terror." Interviewees described the experience of living under constant surveillance as harrowing. In the words of one interviewee: "God knows whether they'll strike us again or not. But they're always surveying us, they're always over us, and you never know when they're going to strike and attack."[18]

Though they narrate a distressing tale of life under drones, these observations are anecdotal and have yet to make their way into the legal analysis of US drone strike practices in Pakistan. Until a comprehensive study is undertaken to chart this acoustic phenomenon it is unlikely that the implications of chronic drone sonics will be integrated into the legal framework of International Humanitarian Law (IHL) as it bears upon the principles of distinction, proportionality, and precautions. Acoustics are undoubtedly part of the arsenal of military operations and have been used for centuries to obtain advantage in warfare. Applying the principles of IHL to drone surveillance in FATA would necessitate applying all feasible measures to limit the harm done to civilians, and prohibiting such operations where the harm is excessive in relation to the military advantage that the operation could be expected to achieve. Lawyers at Reprieve, a legal rights organization in the United Kingdom that advocates on behalf of drone strike victims, have informed me that work is slowly being undertaken to map the increased use of antidepressants in FATA. This information will be helpful in registering the psychological dimension of drone warfare, even if direct causal links between drone emissions and depression will be difficult to establish, and thus argue legally.

For a period of five weeks following the abduction of Corporal Gilad Shalit on June 26, 2006, Israeli Air Force jets flew repeated low-altitude sorties over the Gaza Strip at night, generating a series of intimidating sonic booms. When questioned as to the use of sonic booms to generate an atmosphere of fear and anxiety, Prime Minister Ehud Olmert replied that "thousands of residents in southern Israel live in fear and discomfort, so I gave instructions that nobody will sleep at night in the meantime in Gaza."[19] According to lawyers at B'Tselem, the Israeli Information Center for Human Rights in the Occupied Territories:

> The use of sonic booms flagrantly breaches a number of provisions of International Humanitarian Law. The most significant provision is the prohibition on collective punishment. Article 33 of the Fourth Geneva Convention, which is intended to protect civilians in time of war, categorically states that "Collective penalties and likewise all measures of intimidation or of terrorism are prohibited." The Article also states that, "Reprisals against protected persons and their property are prohibited." Air Force supersonic sorties also breach the principle of distinction, a central pillar of humanitarian law, which forbids the warring sides to direct their attacks against civilians.[20]

In response to these nightly operations, Physicians for Human Rights and the Gaza Community Mental Health Programme filed a petition in the Israeli High Court, claiming that deploying sonic booms as an intimidation tactic was in violation of IHL and therefore constituted an illegal act. Their petition ultimately turned on the question of whether sonic booms constituted an attack as defined in the IHL rules governing the conduct of hostilities, with military lawyers arguing that the petitioners' claims were unfounded since sonic booms do not constitute an "attack," and that, consequently, their use was not accountable within the framework of IHL governing the conduct of hostilities. "As mentioned, the prohibitions and limitations of the laws of warfare, in classified operations refer to 'Attack'. What is meant by the term 'attack' refers to acts of violence involving weapons used for or against another target." Establishing the illegality of sonic booms as an instrument of collective punishment required a redefinition of sound as a weaponized technology, a reclassification that did not convince the court, which dismissed the case in October 2008, as effectively being theoretical because the Israeli military had abandoned the practice of generating sonic

booms over Gaza by July 2006. Moreover, the defense argued that "supersonic booms do not cause 'unnecessary suffering' of enemy fighters," and that the petitioners' claims as to the illegality of sonic booms were based on the assumption that their use in Gaza was intentionally directed against its civilian population for the express purposes of intimidation and collective punishment. "This premise regarding the purpose of making supersonic booms is erroneous. And therefore any legal argument based on it is wrong."[21] An earlier legal reference to sonic booms can indeed be found in a Nicaraguan case put before the International Court of Justice (IJC): Military and Paramilitary Activities in and against Nicaragua.[22] In this case the ICJ did not find that the American use of sonic booms constituted a violation of the prohibition on the use of force against another state. Israeli military lawyers relied upon this ruling to defend their own use of sonic booms over Gaza. Yet both the rejection of sound as constituting a form of assault, and the assertion that sonic booms are harmless, were flagrantly contradicted in the initial public statement made by the prime minister.

This case raises a series of very pertinent questions that may also come to play a significant role in the legal claims being brought by drone strike survivors on behalf of victims and their families in Pakistan. (1) How are we to understand the legal difference between the use of sound as an instrument of policing and control, versus sound that is used as a weapon? (2) If sound waves, due to their radiating nature, are unable to differentiate between a target (militant) and a community of civilians, does the argument around intentionality still hold legally when the continued deployment of a given weapon has known effects that supersede the technology's intended use? (3) At what point is a sound-event that is the by-product of a specific military technology deemed to be sufficiently harmful to count as collateral damage? (4) If these side effects are known, does continued use of the technology constitute a form of legal liability? (5) Does the constant sonic presence of drone sorties (irrespective of strikes) violate the IHL principles of distinction, proportionality, and precautions, or might it even be considered a form of collective punishment as defined by Article 33 of the Fourth Geneva Convention, even if intent to punish a civilian population would arguably be difficult to prove in relation to drone deployment in Pakistan? While sonic warfare has a long history, legal arguments will need to be made that the sound effects (psychological and physical) of drone warfare cannot be dismissed as an incidental feature of drone propellers and engine noise, but are well known to health care professionals and are being systematically documented.[23]

It is worth noting that aircraft noise already has a quasi-legal status, and has been argued to be an agent of warfare even though the legal petition (HCJ 10265/05 *Physicians for Human Rights v. The Minister of Defense*) that brought forward the claim against sonic booms in Gaza was ultimately dismissed by the Court.[24] Municipalities with airports are already subject to by-laws that regulate the flight corridors of low-flying aircraft to minimize sound pollution. This entails controlling the effective perceived noise decibels (EPNdBs) resulting from air traffic as well as the aerodynamic noise produced by airplane propulsion systems. Legal requests have also been made to the European Court of Human Rights to ban the use of the "Mosquito," an anti-loitering device, which emits painful high-frequency pulses audible only to children and youths. (The technical term for repetitive drone surveillance over one area is also called "loitering.") The UN Committee on the Rights of the Child has "called on all governments to reconsider the Mosquito devices, insofar as they may violate the rights of children." While the Home Office and the EU commission rejected this appeal on the grounds that there was "insufficient information to establish guidelines for safe exposure to high frequencies," the Mosquito was not endorsed by the Association of Police Officers (UK), who argued that, equally, there is no evidence to suggest that short-term exposure to its emissions has no health implications.[25] Whether local constabularies choose to use the Mosquito is, however, up to them.[26] Uncertainties and negative evidence as to what constitutes safe exposure times and acceptable sound levels before injury is inflicted shape this debate. Thus recommendations and regulations governing the use and extent of sound-producing technologies are already legally entangled, even if the use of such sonic instruments is not necessarily enforceable under law.

> "Depression is really high in Waziristan," said Doctor Muktar ul-Haq, head of the psychiatry department at the government-run Lady Reading Hospital in Peshawar, the largest city in the northwest. "There is uncertainty generally in Pakistan but particularly in this area. They are always apprehensive about the drones, about their lives," he said. While drone attacks do bring patients "episodically" for treatment, he says, residents in Waziristan complain of living in constant fear of drones that patrol in the skies above and the buzzing sound they say they emit.[27]

The high-resolution optical sensors carried by drones, which, in principle, permit laser-guided, pinpoint accuracy, underscore military and political claims that the use of armed drones dramatically lowers civilian casualties, in comparison to conventional weapons such as cluster bombs—or even, according to some, such as John Brennan in 2011, eliminates civilian casualties altogether, transforming UAVs in effect into "moral predators."[28] However, the acoustic seepage from drone sorties is far from contained, and thus radically expands their zone of impact upon the human ecologies of FATA, with varying consequences for individual mental health as well as for the social dynamics of communities. "Drones have been circling over Manzar Khel for two or three years now. They are all my children can think about and they cannot concentrate on their studies or play carefree like children should."[29] The sonic bleed of a circling drone that one cannot

necessarily see but hears is a constant reminder that a deadly strike may come at any time, quite literally out of the blue. Unremitting drone surveillance has created a widespread culture of fearful apprehension, to the extent that the sound of loitering drones triggers mental and bodily responses—indicative of post-traumatic stress disorder—in advance of a drone strike having actually taken place. "Anxiety is best conceptualized as a future-oriented cognitive-affective-somatic state, the prominent feature being a sense of uncontrollability focused on possible future threat, danger, or other upcoming, potentially negative events."[30]

A drone strike that lurks in the future, but whose effects are experienced in the present, finds its disconcerting inversion in the US policy of targeted killing, which is designed to eliminate potential terrorist threats before they become actualized at some future date. Jeremy Scahill, in his documentary film *Dirty Wars* (2013) goes so far as to suggest that the assassination of the teenage son of radicalized cleric Anwar al-Awlaki in Yemen in 2011 (both father and son were born in the United States) was carried out not because of the terrorist the boy was, but rather because of the terrorist he might one day become.[31] When questioned about the drone strike that killed sixteen-year-old Abdulrahman al-Awlaki, Robert Gibbs, former White House Press Secretary and senior adviser to President Obama's re-election campaign, replied that the boy should have had "a more responsible father." The spatial dispersion of drone sonics brings the future into the present as a felt effect, whereas drone vision is directed towards staving off a future event through targeted assassination. Together they conjoin to produce a state of continuous violence for civilian life under drones, one that categorically overturns President Obama's most recent assertion that drone warfare is "a war waged proportionally, in last resort, and in self-defence."[32]

Postscript

During a CNBC interview in 2009, a determined fly kept buzzing around the President. "Get out of here," warned Obama in irritation, yet the insect brazenly persisted. When it finally landed on his forearm, he struck, killing it instantly. "That was pretty impressive wasn't it? I got the sucker."[33]



Fig. 5. Photo: Win McNamee/ Getty Images, June 22, 2010. Detail.

1 "17.03.2011 Jirga Drone Strike," in *Witness Declarations*, ed. Usama Khilji (Islamabad: Reprieve and Foundation for Fundamental Rights, 2012).

2 President Obama signed three executive orders on January 22, 2009, directing the CIA to shut what remained of its network of secret torture prisons, and ordered the closing of the Guantánamo detention camp within a year.

3 "You know, due process to most of us is a court of law, it's a trial by a jury. And right now, their process is him [Obama] looking at some flash cards and a power point presentation on 'Terror Tuesdays' in the White House. For a lot of us, that's not really due process." Senator Rand Paul on Obama's May 23, 2013, foreign policy address at the National Defense University, Washington DC, in which he addressed the legal use of drones.

4 Chris Woods, Project Leader of "Covert Drone Wars" at the Bureau of Investigative Journalism (BIJ) provided me with this estimate. The figures for drone strikes in Afghanistan, representing a ratio of approximately 30:1, can be found on the BIJ website in Chris Woods, "Revealed: US and Britain launched 1,200 drone strikes in recent wars," December 4, 2012, http://www.thebureauinvestigates.com/blog/2012/12/04/revealed-us-and-britain-launched-1200-drone-strikes-in-recent-wars/. Using the same ratio to estimate the number of sorties in FATA over recent years, we arrive at the following figures:
2009: 53 strikes = ca. 1,500 sorties
2010: 128 strikes = ca. 3,800 sorties
2011: 75 strikes = ca. 2,250 sorties
2012: 48 strikes = ca. 1,500 sorties
2013 (up to June): 14 strikes = ca. 420 sorties

5 "The blueprints for the new drones, which have been developed by Sandia National Laboratories—the US government's principal nuclear research and development agency—and defence contractor Northrop Grumman, were designed to increase flying time 'from days to months.' The highly sensitive research into what is termed 'ultra-persistence technologies' set out to solve three problems associated with drones: insufficient 'hang time' over a potential target; lack of power for running sophisticated surveillance and weapons systems; and lack of communications capacity. The Sandia-Northrop Grumman team looked at numerous different power systems for large- and medium-sized drones before settling on a nuclear solution. Northrop Grumman is known to have patented a drone equipped with a helium-cooled nuclear reactor as long ago as 1986, and has previously worked on nuclear projects with the US air force research laboratory. Designs for nuclear-powered aircraft are known to go back as far as the 1950s." Nick Fielding, "US draws up plans for nuclear drones," *Guardian*, April 2, 2012.

6 Survivor of a drone strike in Mir Ali, FATA Pakistan (anon.), "4.10.2010 Mir Ali Drone Strike," in *Witness Declaration,* ed. Andreas Schüller (Berlin: ECCHR, 2013), 1.

7 Given the near-complete absence of communications technologies in FATA, survivors of drones strikes may testify only long after the fact, when interviewed by lawyers or journalists outside of the region. Female deaths also often go unreported due to tribal customs that shy away from publicly naming deceased wives and sisters.

8 The Bureau, "Obama Pakistan 2011 strikes," Bureau of Investigative Journalism, August 10, 2011, http://www.thebureauinvestigates.com/2011/08/10/obama-2011-strikes/.

9 Interview with Mohammad Kausar (anonymized name), in Islamabad, Pakistan, February 26, 2012. James Cavallaro, Stephan Sonnenberg, and Sarah Knuckey, *Living Under Drones: Death, Injury and Trauma to Civilians from US Drone Practices in Pakistan* (Stanford, CA: International Human Rights and Conflict Resolution Clinic, Stanford Law School; New York: NYU School of Law, Global Justice Clinic, 2012), 84.

10 Guillaume Lavallee, "Drones take toll on mental health," *China Daily,* April 8, 2013.

11 It is by no means a conceptual vagary that the drone maintains a filial link with the *Insecta* class of organisms, as a new generation of Micro Air Vehicles (MAVs) based on the morphologies of insects are being developed, whose sensors will enable them to find, track, and target adversaries while operating in even less perceptible/detectable ways than the current generation of armed drones. See "Lethal Buzz: US Air Force Developing Insect-size Drones," *Russia Today*, February 20, 2013, http://rt.com/news/air-force-tiny-drones-190/.

12 Data is gathered by the drone's various sensors (including electro-optical and infrared cameras as well as synthetic aperture radar) and is relayed back to an operator in Nevada through a system of secure data links with only a 1.2 second delay in transmission. 5,000–25,000 feet is the altitude ceiling of a typical US Predator drone.

13 "17.03.2011 Jirga Drone Strike."

14 Nick Wing, "Brandon Bryant, Former Drone Operator, Recalls What It's Like to Watch Target 'Bleed Out' on Screen," *Huffington Post*, June 6, 2013.

15 See Georgia Research Tech Institute, "The Silent Treatment: Aeroacoustics Research on UAVs Could Lead to Stealthier Surveillance," http://www.gtri.gatech.edu/casestudy/silent-treatment-aeroacoustics-research-uavs, accessed July 9, 2013.

16 See M. Gurubasavaraj, S. Ravi Sekar, and S. Sadasivan, "Acoustic Signature of an Unmanned Air Vehicle - Exploitation for Aircraft Localisation and Parameter Estimation," *Aeronautical Development Establishment Bangalore*, vol. 51, no. 3 (2001): 279–83. See also P. Marmaroli, X. Falourd, and H. Lissek, "A UAV motor denoising technique to improve localization of surrounding noisy aircrafts: proof of concept for anti-collision systems" (Lausanne: Ecole Polytechnique Fédérale, 2012). See also William L. Wilshire and David Chesnut, "Joint Acoustic Propagation Experiment (JAPE-91)," workshop proceedings sponsored by NASA and the University of Mississippi, Oxford, held in Hampton, Virgina, April 28, 1993.

17 For a discussion of the technical failures of drone technology see Medea Benjamin, *Drone Warfare: Killing by Remote Control* (London: Verso, 2013), 23–24.

18 *Living Under Drones*, 81.

19 B'Tselem, "The Sonic Booms in the Sky over Gaza," January 1, 2013, http://www.btselem.org/gaza_strip/super sonic_booms.

20 Ibid.

21 The details of the defense are as follows: "(1) The use of sonic booms by the IDF has an intended military purpose that is operationally significant, which is disrupting the capabilities of terrorists, deterrence and reducing the opportunities to continue to harm the State of Israel and its citizens, among others, by launching rockets, creating sense of confusion, Disinformation, danger and surveillance. Making supersonic booms is designed to achieve a purpose that is legal and permitted (principle of military necessity); (2) The use of sonic booms is not directed towards targeting civilians but against legitimate targets—those who engage in terrorism against Israel and its citizens. Consciousness and psychological effects, expressed feelings of anxiety and fear among the civilian population, as those caused during the execution of sonic booms (and this has not been proven), are considered minor and incidental results for which the booms are made, and legitimate under the law of war. This is typical of the effects of the many means and realities of combat (the principle of distinction); (3) Even if there is damage caused to the civilian population and property (and even this has not been proven), this is incidental, very minor, which is entirely disproportionate to the military advantage that outperforms these booms (principle of proportionality); (4) supersonic booms do not cause 'unnecessary suffering' of enemy fighters (the principle of humanity)." Response submitted to the Israeli High Court of Justice by the State in HCJ 10265/05 *Physicians for Human Rights v. the Secretary of Defense*. Original in Hebrew.

22 Nicaragua v. United States of America, ICJ Rep. 1986, http://www.icj-cij.org/docket/files/70/6503.pdf.

23 See Steve Goodman, *Sonic Warfare: Sound, Affect, and the Ecology of Fear. Technologies of Lived Abstraction* (Cambridge, MA: MIT Press, 2010).

24 Thank you to Eitan Diamond, Legal Adviser to the Delegation of the International Committee of the Red Cross, for bringing this legal petition to my attention.

25 Amelia Hill, "Mosquito Youth Dispersal Alarms Face Ban," *Guardian*, June 24, 2010.

26 For example, "London 2012: Army to use 'sonic weapon' on Thames during Olympics," *Guardian,* May 12, 2012: "The Ministry of Defence has confirmed that a device that can be used as a 'sonic weapon' will be deployed in London during the Olympics. The American-built, long-range acoustic device (LRAD), which has been used by the US army to control crowds in Iraq, can emit an ear-piercing beam of sound. A MoD spokesman said the device, which can also be used as a loudspeaker, was among a 'broad range of assets' being used by the armed forces to provide security during the Games."

27 Lavallee, "Drones take toll on mental health."

28 Jack Serle and Chris Woods, "Secret US documents show Brennan's 'no civilian drone deaths' claim was false," Bureau of Investigative Journalism, April 11, 2013, http://www.thebureauinvestigates.com/blog/2013/04/11/secret-us-documents-show-brennans-no-civilian-drone-deaths-claim-was-false/. See also Bradley Jay Strawser, "Moral Predators: The Duty to Employ Uninhabited Aerial Vehicles," *Journal of Military Ethics* 9, no. 4 (2010): 342–68.

29 Witness to a drone strike in Datta Khel, FATA Pakistan, March 17, 2011.

30 D. H. Barlow, B. F. Chorpita, and J. Turovsky, "Fear, Panic, Anxiety, and Disorders of Emotion," *Nebraska Symp. Motiv*. 43 (1996), cited in Phyllis Chua et al., "A Functional Anatomy of Anticipatory Anxiety," *NeuroImage* 9 (1999): 563–71, at 563.

31 Rick Rowley, dir., *Dirty Wars* (USA, 2013), documentary, 87 min.

32 "Barack Obama defends 'just war' using drones," BBC, May 24, 2013, http://www.bbc.co.uk/news/world-us-canada-22638533.

33 "Barack Obama swats fly mid-interview," BBC, June 17, 2009, http://news.bbc.co.uk/1/hi/8104495.stm.

A Secret in Plain Sight

Chris Woods

Despite the US drone targeted killing project having killed upwards of 3,000 people in strikes across three continents, details remain highly classified. In an effort to address this information vacuum, civic society (in the form of academics, journalists, lawyers, and activists) has sought to gather empirical evidence from the field in highly challenging circumstances. Such findings have helped further our understanding of this novel method of warfare. Yet instead of supporting or critiquing such efforts, the United States has actively sought to undermine research by employing the architecture of secrecy itself.

On a May night in 2012, the small town of Shabam in Arabia's Yemen was without electricity, lit only by a waning moon. Suddenly and without warning daylight briefly came, followed by the crashing sound of an explosion. Alarmed residents rushed out of their homes to find the remains of a burnt-out vehicle just beyond the town's limits, three charred corpses still inside.

Despite bitter fighting between US-backed government troops and Islamists to the south, Hadramout province had remained mostly at peace following Yemen's chaotic Arab Spring uprising. In other parts of the world the spontaneous nighttime destruction of a car and its occupants might have provoked mystery. Yet in Shabam that night, many already knew the answer. America's "secret" drone war had finally come to town.

They knew because for more than a year, US-armed drones had been attacking targets across Yemen, with strikes confirmed to the media by (always anonymous) officials. They knew because hundreds of alleged militants—and dozens of civilians—had already died. They knew because for some days now, drones had been seen over Hadramout trying to spot al Qaeda militants fleeing the fighting. And they knew because in the hours prior to the Shabam strike, Yemeni micromedia sites had reported on a convoy of "militant vehicles" heading to Hadramout. Shortly after the attack, lawyer Haykal Bafana's family telephoned him to describe what had happened. Minutes later Bafana was tweeting details to the world.[1] As a Yemeni friend once rhetorically asked me after an intense bout of US bombing: "Why does America say these attacks are secret? Here everybody knows about them. Everybody!"

That night in Shabam three named men died in a drone attack, all allegedly linked to al Qaeda in the Arabian Peninsula. Yemen's government posted their identities on a website, though referred obliquely to their deaths as taking place in an "air strike." As the country's new president

would later tell Washington reporters, the US "helped with their drones because the Yemeni Air Force cannot carry out missions at night."[2] Could such an event really be considered a secret? That is the fiction the US believes we should acquiesce to.

A decade earlier, Yemen had provided the live firing range for a novel US tactic: the targeted killing—or assassination—of terrorist suspects beyond the battlefield using Predator drones. Secretly funded and developed by the Central Intelligence Agency (CIA) for a decade, armed drones had been deployed for the first time shortly after September 11, 2001, in Afghanistan, and their use in conventional conflicts continues to change the way war itself is fought. Yet the US—and later Israel—soon realized that these novel weapons were also uniquely suited to assassination. Able to loiter persistently and beyond sight above a target, they allowed decision-makers to observe events, in real time, thousands of miles away. It became possible to act upon life and death decisions instantly, a power which George W. Bush and Barack Obama have eagerly embraced.

Predator. The delivery platform itself is shockingly low tech: a clumsy, remotely piloted aircraft with a maximum (propeller-driven) speed of 135 miles per hour. Yet on its bulbous snout sit military-grade surveillance technologies which are the envy of most nations, while beneath its skinny wings are two Hellfire missiles, each weighing less than a twelve-year-old child. Each is able to hit a target with unprecedented precision while being watched in real time by generals and presidents half a world away. Back in November 2002 six men died in just such a strike, including an American citizen. Another had been linked to the deadly bombing of a US warship. In the words of a government minister at the time, the US had "gotten rid of somebody dangerous." All were suspects in terror cases. None had been charged with any offense.

Four hundred drone strikes later, more than three thousand people have been killed beyond the battlefield by Predator and its more muscular sibling Reaper. This is the largest US targeted killing project since Vietnam; part of a broader assassination program aimed at destroying al Qaeda and its allies, along with Islamist insurgent groups threatening US interests and those of its own allies. It is also one of the most critiqued campaigns of Washington's Global War on Terror: the subject of countless lawsuits, academic studies, books, films, documentaries, and news features. The president of the United States himself has taken to the airwaves and to the web to discuss the project. The head of the CIA and numerous other officials, past and present, have offered their thoughts on the legality and ethics of drone targeted killings. Every strike, be it in Pakistan, Yemen, or Somalia, is widely reported on.

Yet this campaign does not exist. Or rather, it might or might not exist. To claim otherwise is simply fanciful speculation, according to US officials. Write to the CIA and it will tell you it can "neither confirm nor deny the existence or nonexistence" of any drone targeted killing project. Others play

along. In January 2012, President Barack Obama became the first US official in a decade publicly to acknowledge the targeted killing project:

> A lot of these strikes have been in the FATA [Federally Administered Tribal Area], and going after al Qaeda suspects […] drones have not caused a huge number of civilian casualties, for the most part they have been very precise precision strikes against al Qaeda and their affiliates. And we are very careful in how it's been applied.[3]

A year later, the American Civil Liberties Union was attempting to prise loose the secret paperwork on which US claims of drone strike legality are based. It cited Obama's speech and those of other government officials, insisting that it was absurd that officials could still employ the "existence or nonexistence" formula to block access. "Not so!" said the Department of Justice:

> Plaintiffs speculate that the President must have been speaking about CIA involvement in drone strikes. They base this inference upon the President's reference to drone strikes in the Federally Administered Tribal Areas of Pakistan, and cite media reports stating that the Department of Defense does not conduct drone strikes in Pakistan. It is precisely this sort of unbridled speculation that is insufficient to support a claim of official disclosure.[4]

And when Obama appeared on a chat show to say that, with the killing of US citizen Anwar al Awlaki, "it was important that working with the [Yemenis], we were able to remove him from the field," what was the response? Here's the Department of Justice again:

> President Obama's statements did not identify what role the United States played in the events that led to Aulaki's death, and thus could not constitute an official acknowledgment that the US government was responsible.[5]

US government denials of involvement in the drone targeted killing program have an absurdist air to them. There are facts relating to this program which the United States doubtless wishes to keep secret for genuine reasons of national security. Yet the present reality is that *all* elements of the "covert" drone war remain top secret, part of a system designed to protect US officials and ministers from public scrutiny.

In this world, officials are able to proclaim "truths" whilst denying access to evidence upon which they base their claims. US federal judge Colleen McMahon has described an "Alice-in-Wonderland world" in which "I can find no way around the thicket of laws and precedents that effectively allow the Executive Branch of our government to proclaim as perfectly lawful certain actions that seem on their face incompatible with our Constitution and laws, while keeping the reasons for their conclusion a secret."[6]

Another federal judge, Rosemary Collyer, was disturbed by government claims that US courts could have no say on the asserted legality of the targeted killing program:

> Your argument is that the court has no role in this—none, none none. I find that a little disconcerting. The scope of your argument concerns me. It gobbles up all the air in the room. … The most important part of the United States is that it is a nation of laws.[7]

Despite repeated assertions to the contrary, it is not yet clear whether US law (never mind international law) considers targeted killings to be legal. The eleven government documents in which the legality of assassinating US citizens is claimed, for example, remain highly classified. Even most members of Congress are barred from reading them. As former CIA Director General Michael Hayden has noted: "Democracies do not make war on the basis of legal memos locked in a D.O.J. [Department of Justice] safe."[8]

The consequences of this game of faux secrecy being played out in US courtrooms are profound when it comes to assessing the impact of US covert drone strikes abroad. All information remains highly classified—even when bombings go disastrously wrong—leaving intelligence officials and politicians free to exploit this public information vacuum for their own ends.

Predators and Reapers gather vast amounts of information prior to, during, and after each bombing. Images will be collected in high-definition video, in synthetic aperture radar, and in infrared. These might be supplemented with phone and e-mail taps, with human intelligence from the ground, and with intelligence assistance from friendly agencies. Has there ever been more information routinely gathered on a target marked for death?

Where errors are made, any forensic investigation might expect to access that rich data resource. There are strong precedents. On February 21, 2010, Predator operators provided the intelligence which led to a lethal US helicopter strike in Afghanistan's Oruzgan province. Some twenty-three civilians died. NATO ordered a major inquiry which resulted in a 2,124-page report, much of it later declassified. The images obtained by the Predator were pored over, along with aerial and follow-up ground photographs. The real-time chat logs of the Predator crew and supporting analysts were also examined. It emerged that the Predator's operators had somehow failed to spot the women who were present, despite three hours of surveillance. They had also decided that obvious children were "adolescents." The report's conclusion was damning:

> The Predator crew's bias towards kinetic operations skewed their reports. The Predator crew emphasized information suggesting the vehicles were hostile, while downplaying or ignoring information to the contrary.[9]

In the following year two US marines died in Afghanistan, in the first known drone "friendly fire" incident. The subsequent confidential report —based on a detailed analysis of video, audio, and text feeds—found that the identities of the two soldiers were never clearly understood by observers prior to their killing. Described at times as "fuzzy blobs," one analyst thought for a while that they were farm animals. Yet still they were killed. While the 381-page report proclaimed that the deaths were due to "miscommunications," with no one "culpably negligent or derelict in their duties," it raised fundamental questions regarding the proclaimed high quality of drone imaging.[10]

This, then, is the world of conventional drone strikes, one in which the US military holds itself accountable for mistakes. The data-rich environment of Predator and Reaper provides the bedrock for most investigations.

Contrast this with events just over the border in Pakistan where the paramilitary CIA carries out all drone strikes (mostly against the same Afghan insurgent targets). Here there are no inquiries. There is no transparency. And there is no known accountability. Here drone strikes may or may not exist. This has led to an inverted world in which the main sources for credible casualty data are journalists, lawyers, and public monitoring organizations. Deprived of the terabytes of data held by the CIA and others, researchers must instead scrabble for evidence where they can find it. Rather than supporting or positively critiquing those efforts, the US intelligence community instead cynically attacks and undermines the credibility of public research wherever possible.

One of the most notorious US "covert" drone strikes took place on the village of Datta Khel on March 17, 2011, killing up to forty-two people. Despite early claims that only militants had been targeted, survivors insisted that casualties were mainly civilian. The men, mostly tribal elders and local police, had gathered for the second day of an officially sanctioned *jirga*—or tribal meeting—to resolve a dispute. As Pakistan's regional military commander at the time (and later Islamabad's military attaché to Washington) has noted:

> We in the Pakistan military knew about the meeting, we'd got the request ten days earlier. It was held in broad daylight, people were sitting out in Nomada bus depot when the missile strikes came. Maybe there were one or two Taliban at that Jirga—they have their people attending—but does that justify a drone strike which kills 42 mostly innocent people?[11]

In Afghanistan, the US military would likely have ordered a major investigation. Yet by late 2013, the US had not held any known inquiry into the devastating events of Datta Khel. Instead the CIA has consistently denied killing any civilians, with one official telling the *New York Times* on the day of the attack that "these people weren't gathering for a bake sale. They

were terrorists."[12] Months later, chief US counterterrorism official (and now CIA Director) John Brennan would even boast that for "almost a year" no civilian had died in US drone strikes in Pakistan. Yet the US refuses to provide empirical evidence to support this assertion.

In contrast, numerous field investigations into the Datta Khel bombing have reported high civilian casualties. Legal charity Reprieve has filed lawsuits in British and Pakistani courts based on multiple survivor affidavits.[13] The law schools of Stanford and New York Universities gathered eyewitness testimony.[14] The Bureau of Investigative Journalism has named twenty-four of the civilians killed following its own fieldwork.[15] Forensic Architecture has worked hard to build a detailed visual understanding of the attack, using satellite imagery and computer graphics. And international news agency the Associated Press, in one of the most detailed field investigations into drone strikes, discovered the names of thirty-eight civilians and four Taliban killed at Datta Khel. Yet as that report noted:

> US officials who were shown the AP's findings rejected the accounts of any civilian casualties but declined to be quoted by name or make their own information public.[16]

Indeed, far from encouraging accountability, the faux-secret world of covert drone strikes has enabled US intelligence officials—almost always anonymously—to undermine researched claims of civilian drone deaths in Pakistan and elsewhere. The Bureau of Investigative Journalism's work has been described by officials as "wildly inaccurate" and accused of aiding al Qaeda.[17] Reprieve's chief lawyer in Pakistan has been described as "put[ting] targets on the backs of Americans serving in Pakistan and Afghanistan."[18]

Leaks from former National Security Agency analyst Edward Snowden indicate that such attacks are most likely the result of a policy decision. A classified document lists "propaganda"—alongside air defense systems and surface-to-air missiles—as representing a core threat to the future of the US targeted killing project. So-called adversary propaganda themes might include the dissemination of information relating to reported civilian casualties and complaints by other nations that their sovereignty has been violated.[19] Within the United States, the strongest legal challenges to the covert drone war have focused on the assassination of US citizens. Yet for the US intelligence community such objections are mere propaganda:

> Attacks against American and European persons who have become violent extremists are often criticized by propagandists, arguing that lethal action against these individuals deprives them of due process.[20]

That glib dismissal of "due process" obscures a hard fact. The US Constitution's Fifth Amendment clearly asserts that no citizen shall "be deprived of life, liberty, or property, without due process of law." This secret drone war, it appears, lies beyond the reach of the Constitution itself.

In a sense the CIA has it right: the covert drone campaign exists. It has evolved from an occasional and highly secretive assassination program under George W. Bush to a publicly acknowledged plank of US foreign policy under Barack Obama, which kills hundreds every year.[21] It does not exist. We are denied the most basic empirical evidence, with civic society obliged to address the ensuing vacuum. Strikes are rarely confirmed. Civilian deaths are refuted. Claims of legality are locked away.

This is a secret in plain sight.

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Persistent Exception: Pakistani Law and the Drone War

Jacob Burns

On July 9, 2013, the Supreme Court of Pakistan returned a petition filed by lawyer Saeed Khursheed Ahmed, advising him to "approach the proper forum for redressal of your grievance."[1] The petition had asked that the government of Pakistan be forced by the court to disclose whether it had an agreement in place with the United States that allowed the CIA to carry out drone strikes on Pakistani soil. The Supreme Court's reply was open about the fact that drone strikes were taking place within the borders of Pakistan: it was not an attempt at secrecy that motivated the petition's dismissal; rather, it was a jurisdictional matter that prevented the Supreme Court from taking on the case. The dismissal stated that "the drone attacks are being made in the Federally Administered Tribal Areas (FATA) wherein […] under Article 247 (7) of the constitution, neither the Supreme Court nor a high court shall exercise any jurisdiction."[2] How is it that an act that is frequently denounced by the government as a "violation of sovereignty,"[3] seems paradoxically to happen in a zone where the state's institutions have no say?

The answer can be found in the area's long use as a productive place for state sovereignty, first by British India, then by Pakistan. The conditions necessary for the enactment of this utility were the set of laws that marked the region and its people as different. Although the Frontier Crimes Regulation (FCR, enacted in the wake of the 1848 British annexation of the Sikh state in the region) were couched in the language of respecting tribal peoples' autonomy and supposedly changeless societies, the system of regulation—as opposed to direct rule—means that FATA has long been used for political purposes by both British Indian and Pakistani governments, and this often through the manipulation or disregard of its people. As we shall see, this has continued from the days of the "Great Game" of the British, through the Jihad against the Soviets, and now affects the occurrence and investigation of drone strikes. These very local conditions are now key for any analysis of the "global" War on Terror's effects in the region.

The histories and processes that have rendered the apex court of Pakistan's judiciary unable to rule on what goes on in FATA are also those that have rendered the Tribal Areas a politically productive zone of exception. These same political and legal factors that have created the exception now simultaneously create the necessary conditions for drone strikes while hampering their investigation. Although the drone war is often, and in some cases rightly, analyzed as part of a newly, and truly, globalized method of warfare, there is much about the particular local context of Pakistan that requires astute understanding if the regional and global connections are to be convincingly made by those attempting to understand the effects of what is actually new in this conflict. Much of what is perceived to be inherent to the areas—the violence and radical Islam often put forward to justify the strikes—find their genesis in the deployment of FATA by outside forces, in ways mostly detrimental to the residents.

It is these powerful outside interests, as much as any quirks of geography or society, that lie behind the difficulty of reporting detailed and reliable information about the strikes from within the region itself. Forensic Architecture's project of "looking again" at the spatial and structural targets of the drones in FATA recovered much important information from previously existing press reports.[4] By methodically counting each reference to the types and locations of buildings hit, as well as details such as whether bodies had been pulled from the rubble, we gained an understanding of what had been reported as hit, and how this had changed over time. However, while this project collated data in such a way that new understanding was gained, it was still based on reports from a region from which it is difficult both to export data and to gain access. Here then is the crucial point for investigating drone strikes in FATA: the possibility of there being information of such quality that could serve as the basis for future redress for victims is only realizable by a transformation that would mean that there could be the possibility of redress at all. That is, it is linked with the transformation of those conditions that create the legal and political exception itself, and deny the courts of Pakistan jurisdiction over FATA. The situation of exception is both that which serves as a condition for the occurrence of drone strikes and that which helps to enfold them in secrecy. Therefore, it is my proposal that one way to develop an investigation of drone strikes, and to overcome such an investigation's inherent limits, is to start to incorporate within it a call for change in local conditions.

Colonial Decisions: The Frontier Crimes Regulation

It is the legal and political decisions of the colonial authorities in British India that still impose upon the Federally Administered Tribal Areas their status as a zone of exception. The decision to exempt the areas from the formal justice system of India and instead place them under the draconian system of the FCR was made because of the difficulties of administering such a mountainous area. Yet these administrative difficulties proved, counterintuitively, to lead in some ways to an advantage for the British at the level of geopolitics. The excuse of "ungovernability" played a large part in making it possible for the area to act as a buffer zone between India, independent Afghanistan, and beyond it the Russian sphere of influence.[5]

Whilst the FCR underwent a number of revisions up until 1901, from then onwards it has remained largely unaltered, with only one set of changes having been made to the text—but not to the substance of the laws—in 2011, fifty-four years after Pakistan's gaining independence from Britain.[6] The regulation is often termed a "black law," and a selection of its provisions for collective punishment gives some idea of its injustice. Article 21 allows for the seizure of the persons or property of any tribe whose member has been deemed to be acting in a "hostile, subversive or offensive manner towards the State or to any person residing within the settled areas of Pakistan."[7] The hierarchy of citizenship inherent in the wording is plain. Article 32 allows for the removal of villages for the undefined purposes of military expediency. Article 50 prohibits any Appellate authority from setting aside the findings of the—notoriously corrupt—councils of elders without "material irregularity or defect in the proceedings."[8] It goes on.

These laws find their legal ground in Article 247 of the Constitution of Pakistan, despite seeming to be in conflict with some of the Fundamental Freedoms enshrined in that same document. It is here that Parliament is debarred from legislating for the area (Clause 2); that the President is vested with all power of regulation (Clause 5); and that the Supreme and High Courts are declared to have no jurisdiction in the areas (Clause 7).[9]

That this thicket of legislation survives, encircling the Tribal Areas and denying their citizens the rights of their countrymen (and women) who live within the "settled areas" of Pakistan, is not entirely a historical accident. The laws are not just odd colonial relics, inadvertently left on the books: they have been retained because the zone of exception that these laws create has proved politically and militarily useful for the government of post-independence Pakistan, as it did for the British before them.

FATA During the Afghan Jihad

Zones of exception are not a mode of withdrawal, but, paradoxically, a potent strategy for intervening in politics.[10] This can be plainly seen in the use of the Tribal Areas as a staging area for the Afghan Jihad against the Soviets. As Afghanistan destabilized, and international financial and material support for the Mujahideen fighting the Soviets became a reality, the status of FATA as a zone of exception proved once again its geopolitical worth to Pakistan and its allies. Primarily, it provided a geographical area whose separation from the formal political structures of Pakistan, and the histories of violence that had both motivated and been promoted by that separation, enabled the proliferation of non-state armed groups. Now the transborder trade and raiding routes linking different Pashtun tribes became the conduits along which the resources of a crusade travelled: whether it was a crusade against Communism, or for Islam, depended on who you were.

The Tribal Areas were not separate from the wider networks that supplied the Jihad, but rather their visible part. The logistics chain of the mujahideen was controlled by Pakistan's ISI (Inter Services Intelligence)[11] and, despite being subject to massive corruption—the CIA later estimated that twenty per cent of all their funding was skimmed off the top,[12] and that only fifty out of every hundred guns were reaching their intended recipients in the Afghan mujahideen[13]—the material and funding moved along it still represented a huge amount of support to the forces fighting the Soviets. This did not go unnoticed by Moscow, who made frequent protestations to the Pakistanis about the use of their territory,[14] and Soviet and Afghan forces violated the border with Pakistan over five thousand times between 1980 and 1989, causing 2,362 casualties.[15]

The Tribal Areas were here again pressed into service as a buffer that both projected and absorbed force, a distinct zone where tribal and non-state proxies could be deployed, and their relationships with the state obfuscated. The area's exceptional status helped to create an illusion of distance between government, ISI, and mujahideen, allowing the Pakistani authorities at least a pretense of plausible deniability, while also drawing attention away from the main infrastructure of the supply effort in Karachi, Rawalpindi and Peshawar. This continued the British policy of "masterly inactivity," whose beguilement lies in clandestinely enforcing the "masterly" while promoting the image of "inactivity." Political and economic profits were being made by those in the center, at the cost of great social change[16]—and eventually violence—in the Tribal Areas themselves.[17]

FATA Now: Opaque Networks

The global blowback from this enthusiastic sponsorship of the Afghan Jihad is well documented, as it helped to put in place the transnational terror networks responsible for the 2001 attacks on America and other atrocities. In the last ten years, however, there has been local blowback as well, with the outsourced violence commissioned by the Pakistani state and intelligence services apparently breaking from the agendas of its instigators, while those agendas have simultaneously both multiplied and become increasingly opaque. FATA has been at the heart of this boom in violence, and its people have been subjected to many of its worst effects: as well as extrajudicial killing by drone, there have been devastating Pakistani military operations and the sadistic rule of terror enacted by the Taliban. Once again, the region has found itself at the center of an international intrigue, in which the history of social manipulation and geography combines to produce a zone perfect for the use of interested parties—only this time, the agendas of some of the non-state actors and parts of the Taliban that Pakistan had previously sponsored no longer match that of the Pakistani government.[18]

Despite the alliance of Pakistan with the US in the War on Terror, and the deployment of troops to Khyber in an attempt to round up those fighters slipping over the border from the battle at Tora Bora in 2001, the ISI was apparently concerned and independent enough to ensure the safe passage of at least some of the fighters crossing from Afghanistan.[19] With its border left unguarded, and the locals initially happy to accept the money that they could make from accommodating and supplying the fighters, South Waziristan quickly flourished into an epicenter of international militancy.[20] When the Pakistani military was finally forced into mounting an offensive in South Waziristan, it was partly because of American cajoling and promises of aid,[21] and partly because attempts on Musharraf's life had been traced back to the region. The operation met with opposition that surprised with its ferocity, and the casualties taken in exchange for the attainment of such a meager outcome—whispered reports of the wounding of Tahir Yaldashev, the leader of the Islamic Movement of Uzbekistan[22]—were politically unsustainable. A peace deal was soon negotiated with Nek Mohammad, a prominent militant leader from Waziristan, but it was widely seen as a capitulation on the part of the Pakistani military, ceding territory and control to the militants in a huge swath of Waziristan. The peace deal quickly failed, and in its wake the Taliban began assassinating both the tribal elders who had been responsible for raising pro-government *lashkars* (posses) that had sought for foreign fighters *and* those elders who had helped set up the peace negotiations.[23] On the opposite side, a different program of assassinations was given the green light: Nek Mohammed became one of the victims of the first drone strike on Pakistani soil on June 17, 2004.

What had been a zone whose sovereignty had been suspended in a productive tension by and for the Pakistani state now seems to have had that balance upset. Violence has spiraled out of control, penetrating and permeating both the tribal and settled areas to a horrific extent. However, the exceptionalism of FATA has not ceased to be productive: it has allowed them to serve as the perfect stage for the development of the US drone program. In the early years, when the Pakistani government was happy to cooperate with the US, the region's enforced remoteness and the potential it offered for outsourcing violence allowed them to repeat the strategy of denial that had characterized the years of the Afghan Jihad. Early casualties of the drones were said to have died in "bomb-making accidents": the remote and secretive nature of FATA that had been produced over long years was once again both motivating factor and cover for covert operations.

Drone Strikes in FATA: The Importance of the Ground

It would be a mistake, therefore, to read drone strikes as events in which the ground is somehow unimportant. The networks that characterize the use of these Unmanned Aerial Systems are indeed global, encompassing as they do the pilots in America, ground crews in Pakistan and/or Afghanistan, and the complicated linkages of satellite communications that connect them with the aircraft and with those who are directing the strikes. Certainly, there is the potential there for the technology to strike targets in much of the world. However, as with all technological fetishizations, the fantasy image of the global war overstates itself dramatically, and in so doing ignores the very particular local conditions necessary for the prosecution of covert American operations.

It is the zone of "sovereignty in suspense"—both in the sense of suspense as removal and tension—that drone strikes rely on. The exception of the Tribal Areas from the main geographic body of Pakistan is precisely that which has allowed the Pakistani government, at least in the early years of the campaign, to consent in private to the strikes while initially denying and then protesting them in public. The produced geography of FATA as separate zone, without the institutions of modern civil society and without a modern media infrastructure, made possible the execution of a campaign which has been the focus of serious concerns, nationally and internationally. The exception of FATA is the enabling characteristic of the drone campaign. It would be unthinkable for the drones to strike with the frequency with which they have in another area of Pakistan,[24] and indeed it has been reported that an American request to carry out strikes in the vicinity of Quetta, a region with as long a history of violence—and with long running ties with American foes across the border in Afghanistan—was refused by the Pakistani government.[25]

The stakes in the maintenance of this zone are evidenced by the body of the journalist Hayatullah Khan, dumped in the bazaar of Miran Shah, North Waziristan, six months after he had been kidnapped from his car by five unidentified gunmen. Khan had taken pictures at the scene of an apparent "bomb making accident" that had killed Hamza Rabia, an al-Qaeda member. In those pictures, distributed widely by the European Pressphoto Agency, the manufacturing information of a US hellfire missile was plainly visible, embarrassing the Pakistani government, and setting off widespread protests against the American incursion. While the government's involvement in Khan's death is unproven, much of the circumstantial evidence points towards it—including, not least, the journalist's own conviction.[26]

This violence of secrecy—practised not only by the government in the region, but also by the Taliban—necessitates, for the most part, remote sensing in the reporting of what happens in FATA. Of course, many people still live there, and movement is not entirely restricted, but most journalists are now dependent on information provided by local sources as opposed to what they can see themselves. Another source of information is found in the form of statements, mostly anonymous, from military and intelligence officials, as well as from members of militant groups. Not only does the possibility of inaccuracies and lies increase at each stage of remove in the journalistic process, but the distance steadily elides the figures of those who

make their lives in FATA, with reports that name people rare, and accounts that flesh out characters rarer still. This elision is indeed common to all the methods of "looking in" that groups like Forensic Architecture use in attempting to investigate the injustices taking place in the Tribal Areas, whether these take the form of a reinvestigation of press reports, or the use of satellite imagery. The only means of vision from the outside that presents the figure of the individual in FATA in any clarity is the most secret view of all—that of the camera of the drone.

This disparity in resolution—the gap between what we see and what the CIA sees—is exemplified by one element of Forensic Architecture's spatial and structural targets project. Along with the Bureau of Investigative Journalism's Jack Serle, we attempted to mark on previously unlabeled Google Maps' satellite imagery the locations of many small villages reportedly hit by drone strikes. One of our main sources in this effort has been a CIA map of Waziristan, published in 2007—just as the drone program was getting ready to move up a gear.[27] Hence our view shares part of the perspective of the agency responsible for the strikes. This map, released through the Library of Congress, is likely one of the tools used by the CIA in planning and carrying out drone strikes in Waziristan. It gives us a view of one potential element used in the preparation of the campaign, yet we share their line of sight only up to the time of the strike itself. From that point on we are at a disadvantage when we try to investigate the strike, as we lack their video of the event and the even more detailed, classified cartography that went into its execution.

This circumscription of view is also the circumscription of the possibility of investigation and of jurisdiction, and therefore forms the limit which the various attempts at uncovering abuses must constantly run up against. This limit, however, does not necessitate the abandonment of such attempts, but instead represents two radical potentials.

The first is that of revelation: if the CIA is certain in its assertions that the number of civilian casualties is far below the figures that have been reported elsewhere, then the implication is that these claims are based on their access to privileged alternative sources of evidence, the most obvious being their recordings of the strikes. As the investigative journalist Chris Woods has stated, "all of that evidence [for civilian casualties] is publicly presented and transparently sourced. The onus is now on the CIA to release its own casualty data to justify what would presently appear to be unrealistic claims."[28] The release of such information would better open the claims of legality made by the US government for the CIA's targeted killing program, and likely provide the basis for redress where such claims were found wanting.

The second possibility is that of a transformation of the ground. While it would be naïve to imagine a normalization of the legal status of FATA as a kind of panacea, wiping out in a stroke the long accruing and complex problems that afflict the area, it would be an important step. To return to where this essay began, we could say that *the possibility of the Supreme Court ruling on events that take place in the Tribal Areas would simultaneously be the impossibility of FATA existing as a distinct zone*. To remove this exceptionalism would remove precisely that quality which has been so important in making possible the drones' campaign, as well as the other examples of the deployment of FATA for political ends.

As my work on Forensic Architecture's investigation has progressed it has made clear to me the degree to which our limited access to events happening on the ground in FATA is symptomatic of a larger set of political and legal conditions that organize the ground of FATA itself. This uncovering of a whole set of local concerns has changed my view of what the scope of an investigation into drone strikes could—and perhaps should—be developed to include. It should be emphasized that the work necessary to outline a fulfillment of either radical potential discussed above—revelation or transformation—is at a very preliminary stage and faces immense difficulties given the powerful vested interests that continue to shape the conflicts in FATA and Pakistan more generally. However, with FATA's exception being so crucial in enabling the drone campaign—as well as much of the other violence that blights the region—to outline ways in which the effects of this structural injustice might be counteracted seems to me to be a way in which an interest in the strikes, with all its particularities, might be parlayed into work that could have stakes in wider—and much needed—changes for the people of FATA.

1 Malik Asad, "Drone attacks: SC refuses to admit petition," *Dawn.com*, July 16, 2013, http://dawn.com/news/1029561.
2 Ibid.
3 See, for example, Ministry of Foreign Affairs, Government of Pakistan, "Pakistan strongly condemns US drone attack in North Waziristan," April 15, 2013, http://www.mofa.gov.pk/pr-details.php?prID=522.
4 See the Forensic Architecture investigation, "Case: Drone Strikes" in this volume.
5 Thomas H. Johnson and M. Chris Mason, "No Sign until the Burst of Fire: Understanding the Pakistan-Afghanistan Frontier," *International Security* vol. 32, no. 4 (Spring 2008), 41–77, at 52.
6 "Frontier Crimes Regulation (FCR) 1901, As Amended in 2011 (English, including summary of reforms)," available at http://www.slideshare.net/fatanews/frontier-crimes-regulation-1901-amended-2011-english-16663284, accessed September 2013.
7 Ibid., 30.
8 Ibid., 42.
9 Here also, in Clause 4, is the justification for the more recent—and in some cases even more egregious—"Actions (in Aid of Civil Power) 2011," which was enacted in response to the ongoing conflict within FATA, and has seen widespread arbitrary detentions. See Amnesty International, "*The Hands of Cruelty": Abuses by Armed Forces and Taliban in Pakistan's Tribal Areas* (London: Amnesty International, 2012), available at http://www.amnesty.org/en/library/asset/ASA33/019/2012/en/a38b1e69-afee-4e73-bcf2-1405fa0c71fc/asa330192012en.pdf.
10 With thanks to Eyal Weizman for this insight.
11 John K. Cooley, *Unholy Wars: Afghanistan, America and International Terrorism*, 2nd ed. (London: Pluto 2000), 55.
12 David Lyon, *Butcher and Bolt* (London: Hutchinson, 2008), 198.
13 Cooley, *Unholy Wars*, 56.

14 A. Z. Hilali, *U.S.-Pakistani Relationship: Soviet Invasion of Afghanistan* (Aldershot: Ashgate, 2005), 110–11.

15 Ian Talbot, *Pakistan: A Modern History* (London: Palgrave MacMillan, 2005), 268 note 95.

16 One example of this can be seen in the Jihad's provision of independent incomes to the Mullahs. These were the men in charge of the madrasas that had come to occupy such an important place in the infrastructure of militancy—disseminating ideologies and attracting recruits, for example. Traditional tribal structures were already under pressure because of the influx of remittances from sons sent to work in the Gulf post-1973: this sudden and transformative new source of wealth also meant that, for the first time in history, this class of religious leaders as a whole were not dependent on the tribal elders (Maliks) for their living. Their freedom from a system of patronage meant that they were able to enforce their own political agendas for the first time, and, unsurprisingly, these agendas largely took their cues from the Deobandi movement primarily promoted by the Zia regime; these strict interpretations of Sharia have come increasingly to predominate in the Tribal Areas since this period. See Kimberly Marten, "Misunderstanding Pakistan's Federally Administered Tribal Area?" *International Security,* vol. 33, no. 3 (Winter 2008/09): 180–89, at 182–83.

17 Matt Waldman, "The Sun in the Sky: The Relationship Between Pakistan's ISI and Afghan Insurgents," *Crisis States Discussion Papers, 18* (London: LSE Development Studies Institute, 2010), 3, http://www.aljazeera.com/mritems/Documents/2010/6/13/20106138531279734lse-isi-taliban.pdf.

18 Johnson & Mason, "No Sign," 70.

19 Afrasiab Khattak, interviewed in "Return of the Taliban," Martin Smith for PBS Frontline, (Transcript), October 3, 2006, http://www.pbs.org/wgbh/pages/frontline/taliban/etc/script.html.

20 Eliza Griswold, "In the Hiding Zone," *The New Yorker*, July 26, 2004.

21 J. Malcolm Garcia, "Frontier Justice," *Mother Jones*, September 2004, http://www.motherjones.com/photoessays/2004/09/frontier-justice/01.

22 Ismail Khan, "Militants agree to set free hostages: Uzbek warlord hurt while fleeing," *Dawn*, March 27, 2004, http://archives.dawn.com/2004/03/28/top2.htm.

23 These *lashkars* had also destroyed the properties in which foreign fighters had been living, in an echo of the architectural violence legitimated by the FCR.

24 The first strike ever outside of the Tribal Regions occurred on November 21, 2013, with the targeting of a madrassa in Hangu, in Khyber Pakhtunkhwa province. The strike's location, within the settled areas of Pakistan, allowed the Police to file a First Information Report (FIR) regarding the strike for the first time in the drone campaign's nine-year history and therefore bring the event into a judicial process.

25 Greg Miller, "U.S. seeks more drone strikes to slow insurgents," *Washington Post*, November 20, 2010.

26 A few weeks earlier, following threats from a military intelligence Major, he had handed over his last will and testament to his tribe, telling them, "[i]f I am kidnapped or get killed, the government agencies will be responsible." Bob Dietz, "The Last Story," *Committee to Protect Journalists*, September 20, 2006, http://cpj.org/reports/2006/09/khan.php.

27 "Pakistan, Central Waziristan," *United States Central Intelligence Agency,* 2007, http://www.loc.gov/item/2009578101.

28 Interview with the author, London, October 17, 2013.

Case: Drone Strikes



Fig. 1. Findings of Forensic Architecture presented by Ben Emmerson, United Nations Special Rapporteur on Counter Terrorism and Human Rights, as part of the interim report to the UN. The UN Headquarters, New York City, October 25, 2013.

Unmanned Aerial Violence: Covert Drone Strikes in Pakistan, Yemen, and Gaza, 2008–present

Introduction

Although armed drones have been used in Afghanistan from the start of the US campaign in October 2001,[1] the first known targeted assassination by the US outside a theater of war took place in Yemen on November 3, 2002. Since June 2004 the main focus of the drone campaign has been in the frontier regions of Pakistan. The first Israeli drone strikes in Gaza also started around about the same time in 2004, while in Somalia drone strikes began in 2007.

The areas most imperiled by drone warfare are generally outside of the effective control of states but are still subject to the worst of their violence. Waziristan, part of a region of Pakistan known as the Federally Administered Tribal Areas (FATA), is also effectively under a media blackout due to a siege that forbids the entry and exit of nonresidents including journalists, and the taking of images or bringing out of recording devices. The targeted areas of Yemen and Somalia are likewise difficult for nonresidents to enter. Consequently, few images of the damage caused by drones and even fewer eyewitness accounts and survivors' testimonies are available outside of these regions. News reporting has also been uneven and sometimes contradictory. This has meant that some aspects of drone warfare have been more present within public discourse than others. One of the most under-researched aspects of drone warfare has been the spatial; that is, the territorial, urban, and architectural dimension of these campaigns.



Fig. 2. Countries subject to drone strikes since 2002. Visualization: Forensic Architecture and SITU Research.

Forensic Architecture has investigated several issues relating to the spatial mapping of drone warfare; for example, the geographical patterns of strikes in relationship to the kind of settlements (towns or villages) targeted and types of buildings targeted. Our aim was to explore what potential connections there might be between these spatial patterns and the numbers of casualties, especially civilian casualties. The investigation has, to date, primarily consisted in mapping, modeling, and visually animating the data in order to explore this question. Our research and analysis were divided between two primary scales of drone warfare respectively; that is, on the one hand, studying the spatial and temporal patterns of drone strikes on the territorial level, and, on the other, a very detailed architectural examination of a few specific strikes in Pakistan, Gaza, and Yemen.

The Geo-Platform

The first part of our investigation focused upon the production, together with the Bureau of Investigative Journalism (BIJ), of an interactive online platform that plots information regarding the geographical and temporal distribution of drone strikes, the number of people reported killed, and the kinds of targets reported hit. The first stage of the platform, which dealt with strikes in Pakistan from 2004 onwards, was launched in early 2014. It will be expanded to include information on strikes in Yemen, Gaza, and Somalia later in the year. This work was undertaken by trawling through the BIJ's archive of thousands of news reports that detailed strikes in both the global and local media. By looking again at this information—it had already been examined several times by BIJ staff in order to generate a number of their own reports and statistics—we found new data, specifically spatial, that had slipped through the cracks because it was not recorded by the prevailing categories used to classify strikes.[2]

As filters, we developed several new spatial categories. Targets were divided into domestic homes; public, religious, and commercial buildings; as well as outdoor gatherings (meetings, *jirgas*, funerals), markets, and vehicles. In each category we also tried to note the nature and extent of the structural damage, as well as the number of missiles fired, the time of the strike, and whether people had been reported as being pulled out from the rubble.[3] All this information about targets was cross-referenced with information regarding the number of casualties. The locations were largely identified and plotted on the geo-platform using a CIA map of Waziristan, declassified in 2007. This map is important not only because it is still the most detailed one publicly available, but also because it records one of the ways the perpetrators look at the territory.

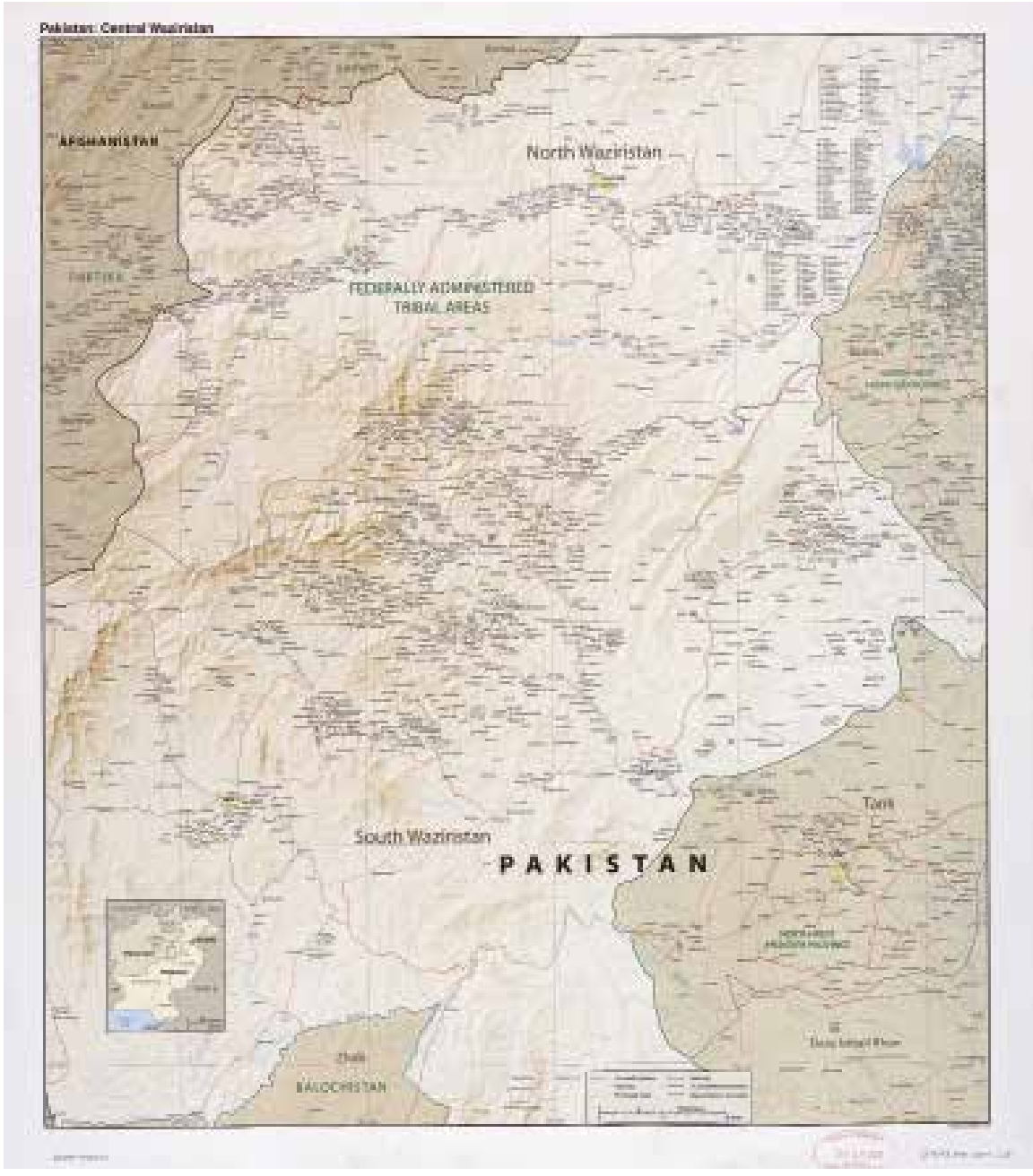


Fig. 3. Map of Central Waziristan. US Central Intelligence Agency, 2007. Source: Library of Congress.

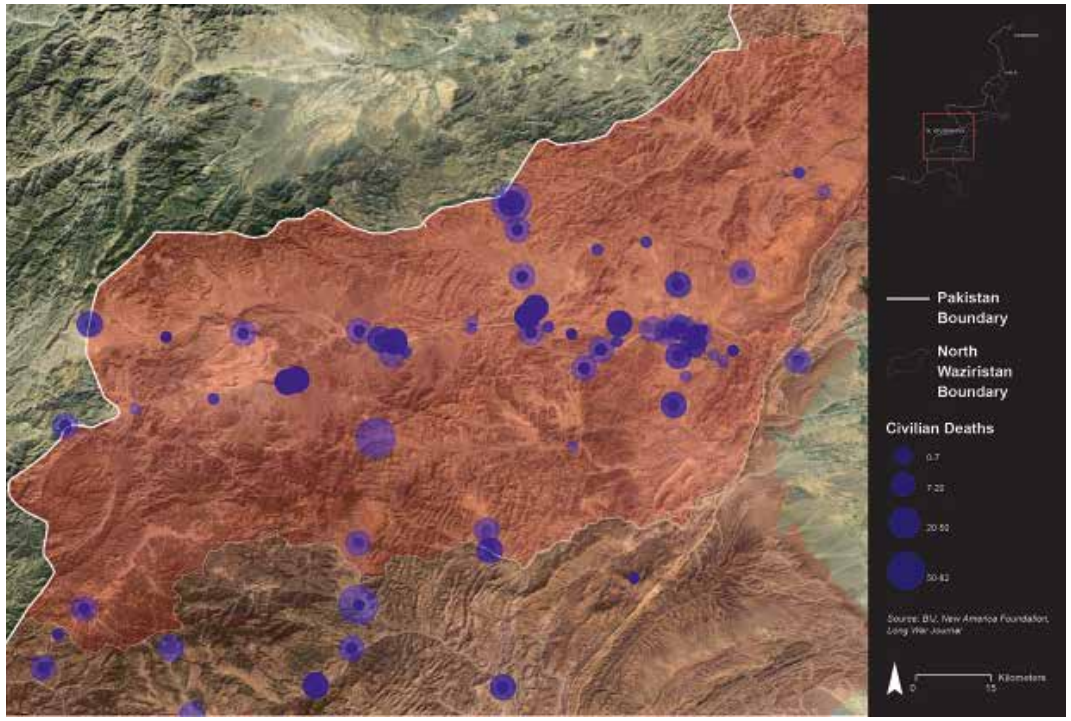


Fig. 4. Civilian deaths from drone strikes in North and South Waziristan. Visualization: Forensic Architecture and SITU Research.

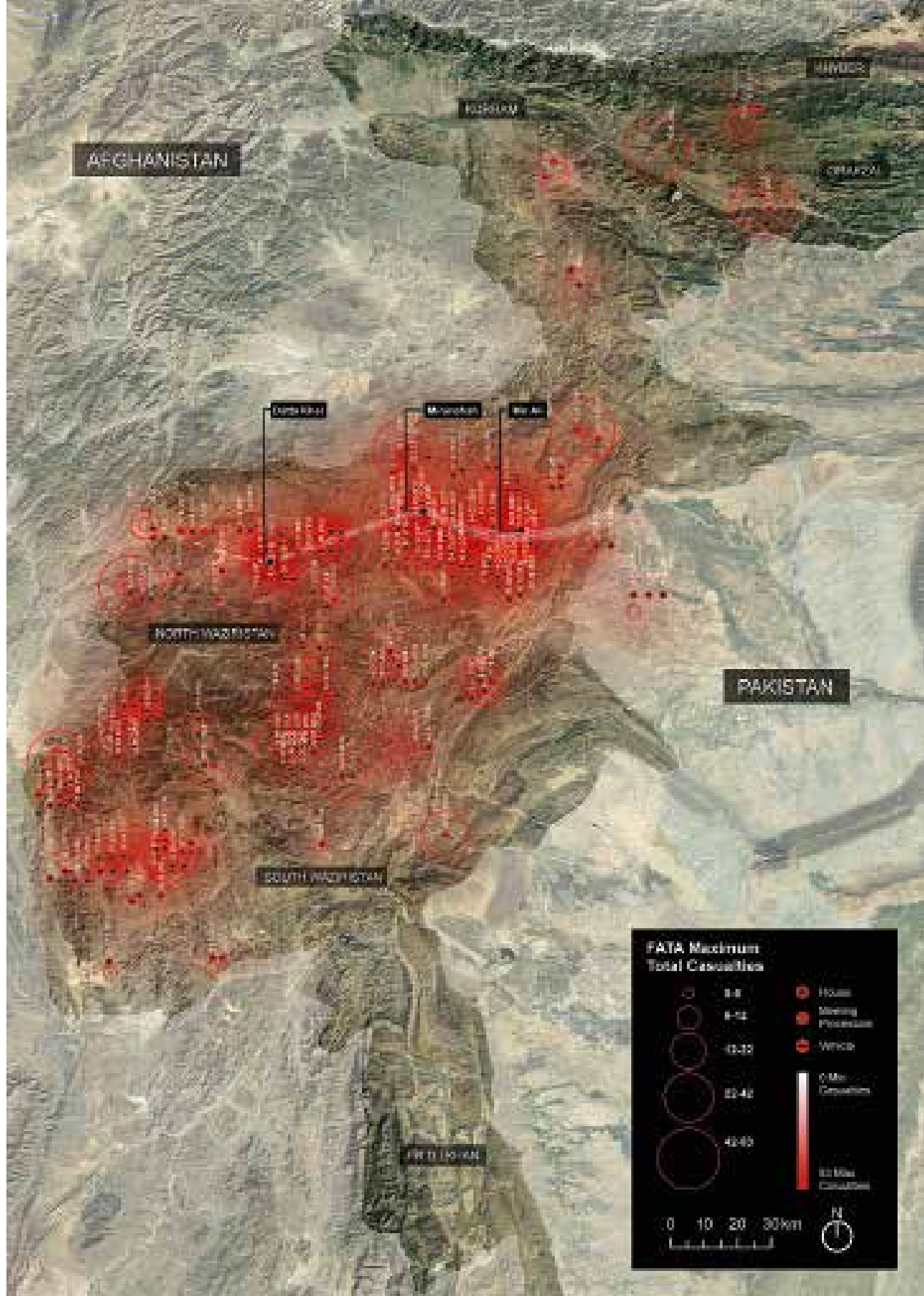


Fig. 5. (right) Target types and casualty numbers from drone strikes in FATA, Pakistan, 2004–2013. Mir Ali, Miranshah and Datta Khel, the locations of strikes investigated in this report are marked on the image. Visualization: Forensic Architecture and SITU Research.

Many of the areas targeted did not conform to the popular conception of FATA as a harsh and sparsely populated zone, as is often the image that is disseminated within Western media with the repeated used of phrases such as "remote tribal region along the Afghan border." In Pakistan between June 2004 and July 2013, 183 of the total 371 strikes hit targets in the Tochi Valley, North Waziristan. This stretch of land runs along the Tochi river, connecting three major towns—Datta Khel, Miranshah, and Mir Ali (which were the sites of our detailed architectural analyses)—and is thickly populated with villages and their fields along its course.

That nearly half of all drone strikes in Pakistan have taken place in the Tochi Valley refutes the widely held notion that the areas under fire are somehow isolated and separated from the spaces of everyday life of Pakistanis.

Forensic Architecture discovered that most drone strikes took place on houses, and it is consequently in houses that most people died. From June 2004 to December 2013 between 234 and 357 houses were reported to have been hit, of which 129 to 167 were reported as having been destroyed. This means that 60–80 % of all drone strikes in Pakistan have hit houses, generating between 1,614 and 2,939 fatalities.[4]

Case Study Analyses

Forensic Architecture undertook detailed case study analyses of five specific drone strikes. These have been created from the perspectives of survivors and on-site witnesses, as well as those that visited the aftermath of the strikes. The aim was to describe, in as detailed a manner as possible, the effects of these strikes on the ground, on architecture, and on the people within them.[5] Each of our investigations is paradigmatic of a different way of working with scarce data. In each case we cross-referenced the different types of data available to us, including satellite imagery, local and international media reports, witness statements, and on-the-ground images when and if we could obtain them. Through these analyses we were able to demonstrate that, despite all inhibiting circumstances, investigating specific drone strikes is in fact possible. Crucially, by using a different methodology in each case study and demonstrating how these innovative ways of analysis may be carried out even when confronted with limited information and research materials, our work may help other investigators working on drone warfare.

The first case study examined two strikes in Datta Khel (March 16–17, 2011) and consisted of the digital reconstruction of an attack in which forty-three people were killed while participating in a traditional arbitration forum known as a *jirga*. The investigation proceeded by cross-referencing spatial and visual information, in particular a careful reading of satellite images, with witness testimonies obtained by Pakistani lawyer Shahzad Akbar. The second case study examined a strike on a residential building in the town of Mir Ali (October 4, 2010) and involved the live construction of a digital model; an architectural aide-mémoire that enabled a survivor to recollect the traumatic event several years later. The third investigation analyzed a strike in Miranshah (March 31, 2012), and involved the detailed frame-by-frame analysis of rare video footage shot in the aftermath of the attack. We subjected this video to intense forensic video analysis, using architectural methods to extract vital spatial information that allowed us to model the strike and shed new light on the event. In the fourth case study we reconstructed the timeline of a drone strike that took place in Gaza during the early hours of January 9, 2009. Specifically, the 180 seconds between a drone-fired nonexplosive missile used as a warning shot and the destruction of the house and the killing of six civilians in it minutes later by a gravity bomb, most likely launched from an Israeli fighter jet. This analysis brought a temporal dimension to our repertoire of spatial methodologies.

Stakeholders

We provided this analysis to different groups seeking accountability for drone strikes, or involved in pursuing legal processes against states using or aiding drone warfare. The research was used in a multiplicity of forums: it was provided to Shahzad Akbar of the Foundation for Fundamental Rights in Pakistan who is litigating the Datta Khel strike on behalf of the family of one of the victims; it also constitutes part of an international investigation by Ben Emmerson, the UN Special Rapporteur on Counter Terrorism and Human Rights (UN SRCT) on drone warfare in Pakistan, Afghanistan, Yemen, Somalia, and Palestine, and was presented as part of his interim report to the UN General Assembly in New York on October 25, 2013. Other groups with whom we worked closely in developing the research, as well as disseminating it, include B'Tselem (Israel/Palestine) and the Bureau of Investigative Journalism (UK). Our work also features in various television documentaries on drone warfare, such as *Töten per Joystick*, a German production, as well as on Al Jazeera.



On-Site Research and Evidence Gathering for Case Study No. 5
Jaar and al Wade'a, Abyan Province, Yemen, 2011

One World Research

Public Interest Research and Investigations

To: Forensic Architecture
From: One World Research
Date: September 30, 2013
Re: Yemen Drone Strike Documentation Work

Report of Photographer/Videographer Anis Mansour of Work Undertaken to Document Two Drone Strikes in Yemen

Anis Mansour was recommended to carry out the documentation work by Yemeni journalist Nasser Arrabyee, who referred to him as the expert on drone strikes that he and other journalists rely on for information.

Instructions were drafted in Arabic and before the trip was made the instructions were discussed with Mr. Mansour with an interpreter on the phone.

On Monday, 9 September, Anis and two colleagues travelled from Aden, Yemen to Abyan Province. The trip was 250 kms each way (around a 4 hour drive) but they were able to do the trip in one day.

Anis and his crew travelled to Jaar, Abyan province first where they photographed and filmed footage of the remaining rubble of Mr. Nuweir Al-Arshani's house, which was targeted in a drone attack in May 2012. Anis was able to interview several people at this site.

He also documented the rubble of Captain Mohamed al Naqib's house, which was destroyed in an American missile attack approximately 10 days before Al-Arshani's house was hit. Captain Mohamed's house was approximately 250 metres from Al Arshani's house. Captain Mohamed was also interviewed and described the attack on his house.

In total, 6 people were interviewed at the site of Al-Arshani's house, however of these 3 spoke in a local dialect which was very difficult to understand and translate.

Anis was able to interview other individuals at various locations in Abyan province who also provided descriptions of drone strikes they have witnessed, though in some cases interviewees were more interested in speaking about personal matters than describing the attacks.

Anis was also instructed to document the police station in Al Wade'a, Abyan—he explained before making the trip that there is no remaining rubble at this site and that a new building has been built on the old site. He was asked to film there regardless. However, he was unable to document this site as his car was stopped by the security forces at a road checkpoint as they were entering Al Wade'a. They were told by the security forces that they were not allowed to film in Al Wade'a, and were warned that there is a strong Al Qaeda presence in the area surrounding the town.

In terms of additional difficulties they faced, Anis explained that they had to avoid the military in the area. There was military presence along the whole journey, and apparently they "generally have a hard time with the military in that part of the country." For this reason, they tried to be as far as possible for them to avoid any troubles. They were stopped at several checkpoints and had to state their business.

www.oneworldresearch.com

Forensic Architecture commissioned One World Research Services to work with their on-the-ground investigators in Yemen to document the aftermath of two drone strikes and interview witnesses. Under the direction of local journalist Nasser Arrabyee, Anis Mansour travelled from Aden to al Wade'a district, Abyan province, via Jaar, to film and photograph the strikes which occurred on July 14, 2011, and May 15, 2012.













(Left) As Anis Mansour travelled to the sites of the two drone strikes, he documented the damaged ruins from the War on Terror scattered throughout the Yemeni landscape. He also stopped to interview ear- and eyewitnesses, who described the fearful effects of living under drone surveillance and ongoing attacks. Forensic Architecture undertook this investigation and fieldwork as part of its research for the UN Special Rapporteur on Counter Terrorism and Human Rights.










(Above) Anis Mansour interviewed witnesses to a drone strike which destroyed Mr. Nuweir Al Arshani's house and killed fifteen civilians on May 15, 2012, in the city of Jaar. Residents recounted the events of that day, including a reported second strike that targeted rescue workers. This type of strike, known as a double-tap, was also noted in the investigations produced by Amnesty International and the Swiss human rights organization Alkarama.



Satellite image, May 5, 2011. Without specific coordinates for this strike, Forensic Architecture scoured a large portion of al Wade'a district using Google Earth, identifying several potential sites prior to acquiring before and after satellite images. According to munitions expert Chris Cobb-Smith, whom we commissioned to interpret the after image, which clearly indicates the building in ruin, the two lighter spots in the dusty courtyard are likely the result of an airburst bomb. These bombs detonate a few meters above the surface to maximize blast force. He noted that the level of destruction was likely due to bombs of at least 500 pounds each. Although they can be dropped from the larger Reaper drone, these bombs are also common ordnance deployed by manned jets.



(Above) Satellite image, July 21, 2011.

(Below) Collage of the destroyed police station composed from individual video frames extracted from footage provided to Forensic Architecture. The image corroborates the findings in the satellite image, where two light-colored circular areas are clearly visible. Cobb-Smith contends that the external compound walls collapsed outwards, likely due to the detonation having taken place inside. The corner walls and stairwell remain, as this is where the building structure would have been stronger.



July 14, 2011. In al Wade'a, Abyan province, up to fifty were killed, including up to thirty civilians, in a targeted strike on a police station, according to local officials, the Yemen Interior Ministry, CNN, and other media sources.

An eyewitness told Al Jazeera that while 6 bodies of killed gunmen were pulled from the ruins of the police station, the death toll could "climb with ongoing rescue operations." The *New York Times* claimed the strike killed 8 militants, while witnesses told CNN that "at least 30 civilians" were among the dead. According to CNN, the US government denied that a US drone was involved in the attack. However, Yemeni officials told the Associated Press that the strike must have been carried out by an American plane "because Yemeni planes aren't equipped for night-time strikes." Journalist Nasser Arrabyee reported that "some 20 al Qaeda fighters were killed … including leaders Hadi Mohammed Ali and Abu Bilal."
(Bureau of Investigative Journalism)



Case Study No. 1: "The Assembly of Evidence"
Datta Khel, North Waziristan, March 16–17, 2011



On the morning of March 16, 2011, a jirga was convened at Datta Khel in North Waziristan, to debate the ownership of a local chromite mine. A jirga is a traditional community gathering that meets to resolve disputes. Reportedly at issue was the method of payment of Rs8.8 million ($100,000) for the mining rights.

This particular meeting took place in an open field in the vicinity of the Nomada bus station, in Datta Khel's bazaar. The jirga lasted two days. It consisted of two large adjacent circles of men seated on the ground. These discussion circles were positioned 3.6 meters apart according to one of the witnesses.

On the first day of the meeting, a US drone struck in the vicinity of Datta Khel, killing 4 to 5 people. Very little is known about this strike.

At approximately 10:45 on the morning of the second day, missiles fired from a US drone struck one of the two jirga circles. Upwards of 43 civilians were immediately killed.

The convening of the jirga had been authorized by the Pakistani military 10 days previously and was thus an officially sanctioned meeting. Members of the local tribal police were also present.

Surely the drones loitering over the tiny area of Datta Khel for two days must have observed the jirga in action. If so, why was a large community gathering targeted on the second day?



Our first obstacle in trying to visualize the strike began with trying to find the location itself, as there are two towns named Datta Khel, located 70 kilometers apart.

JACK SERLE (Bureau of Investigative Journalism): I've just been playing about with the coordinates Reprieve use and we use, and have found there are two towns called Datta Khel, about 45 miles apart. Reprieve's coordinates map to one west to southwest of Miranshah. The other, ours, is northeast, quite close to Mir Ali.



In an effort to solve this mystery, we contacted many different people and organizations, and used the source material that they provided to us: Reprieve, the Bureau of Investigative Journalism, our Islamabad-based researcher, and a retired Pakistani brigadier general, Mahmood Shah, who conclusively confirmed the location for us.



Our second obstacle involved trying to pinpoint the location of the drone strike itself. This was particularly difficult to verify due to the lack of photographic documentation, limited access to survivors, conflicting press reports, and the fact that the strike occurred in an open area, leaving minimal impact damage that can be revealed through satellite image analysis.



We proceeded by identifying key structures mentioned in witness statements. These statements were cross-referenced with other information and compared with before and after satellite imagery.



Using satellite images acquired from January 23, 2011 [left] and April 5, 2011 [right] we were able to identify changes that had taken place in the environment of Datta Khel.

In the images we can see an open area capable of accommodating 40 to 50 people, bounded by perimeter structures. This area is consistent with eyewitness reports.

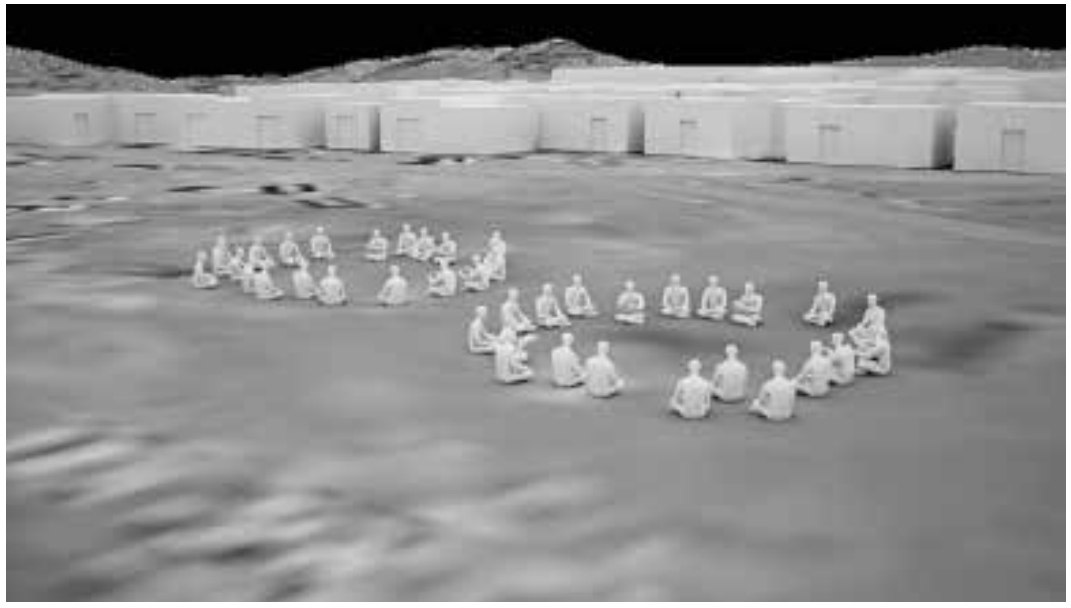
WITNESS 7: As is local tradition, the jirga was held in a large open space near the Datta Khel bazaar.

Detailed examination of the after image indicates subtle surface disturbance and discoloration in the area determined to be the location of the strike. This is consistent with several eyewitness declarations reporting they saw flames and fire all around.



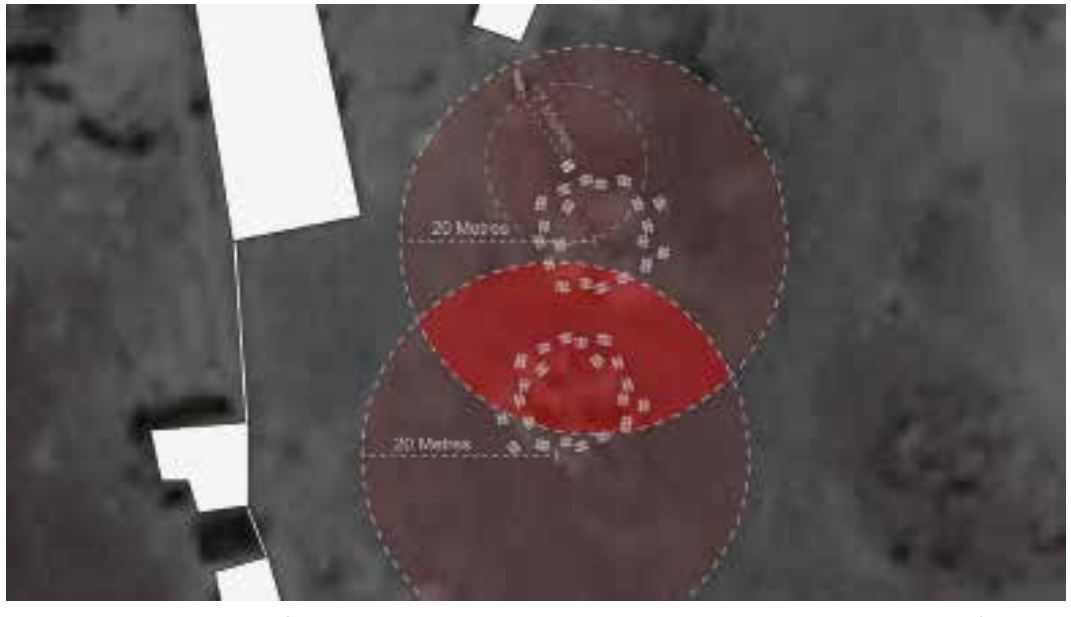
Further examination indicates the presence of two possible impact craters approximately 3.6 meters apart, another spatial feature that supports witness declarations.

WITNESS 5: I visited the place where Din Mohammed was killed by a drone missile ten days after the strike. There was nothing left but a massive crater at the site where the jirga was convened.



The blast radius of a hellfire missile is anywhere up to 20 meters. As the jirga was being held in an open area, there would have been little to absorb the explosion's force. This is borne out by a survivor's description of being violently thrown through the air.

WITNESS 5: On March 17, 2011, in Datta Khel, at about 10:45 in the morning, I was participating in a jirga. […] We were in the middle of our discussion when the missile hit and I was thrown about 7 meters from where I was sitting. I was knocked unconscious.



Another witness—who arrived after the strike—describes the aftermath of such munitions being used on a group of people.

WITNESS 3: When I reached that place, the situation was really very bad. There were still people lying around injured. The tribal elders who had been killed in the strike could not be identified because there were body parts strewn about. The smell was awful.

This diagram provides a detailed understanding of the potential explosive force of the multiple Hellfire missiles that struck the jirga. As indicated, the force would have also been intensified in the areas of overlap between the two points of impact from the missiles. This would have dramatically increased their capacity for killing and maiming jirga attendees.

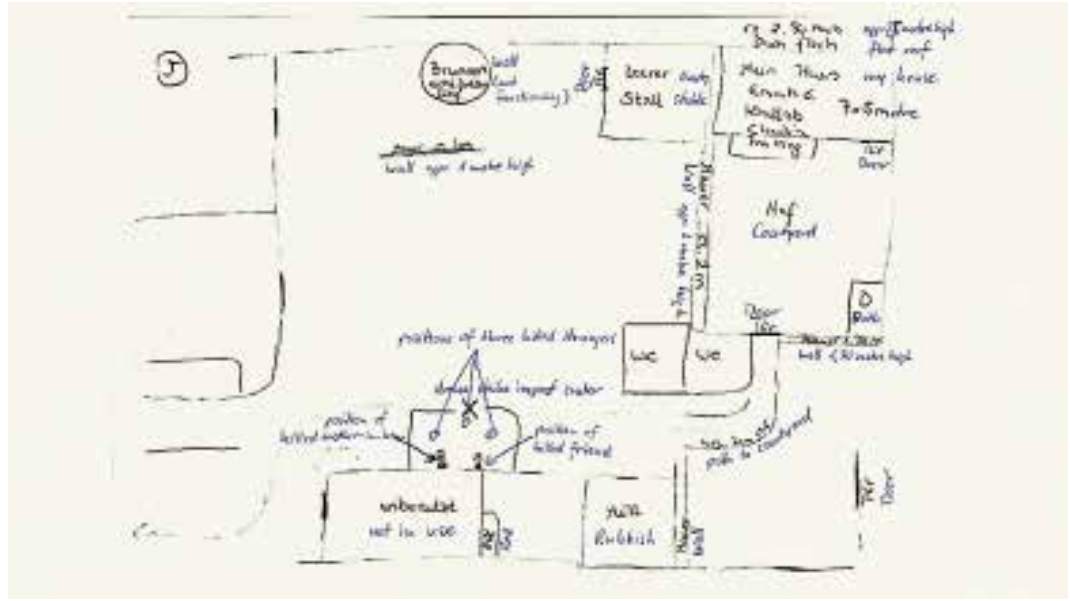


WITNESS 2: As we approached Datta Khel and the location of the jirga, I saw fires burning everywhere. Though fires were burning all around, by the time we arrived all of the bodies—at least that which could be salvaged of the bodies—had been taken away.
WITNESS 3: What I saw when I got off at the bus station near Datta Khel bazaar was a horrible sight to see. I immediately saw flames in and around the station. Women and children at the station were saying that there had been a drone strike and the fires spread after the strike. […] The fires burned in Datta Khel for two days straight.

"Among the civilians killed were Malik Daud, Gul Akbar, Mohammad Sheen, Lewanai, Mir Zaman, Din Mohammad, Malik Tareen, Noor Ali, Zare Jan, Sadiq, Mustaqeem, Khangai, Gulnaware and Faenda Khan. Also among the dead were Dindar Khan, Umark Khan, Wali Khan, Sadar and Bakhtar, all from the Khassadar force."
(Bureau of Investigative Journalism)

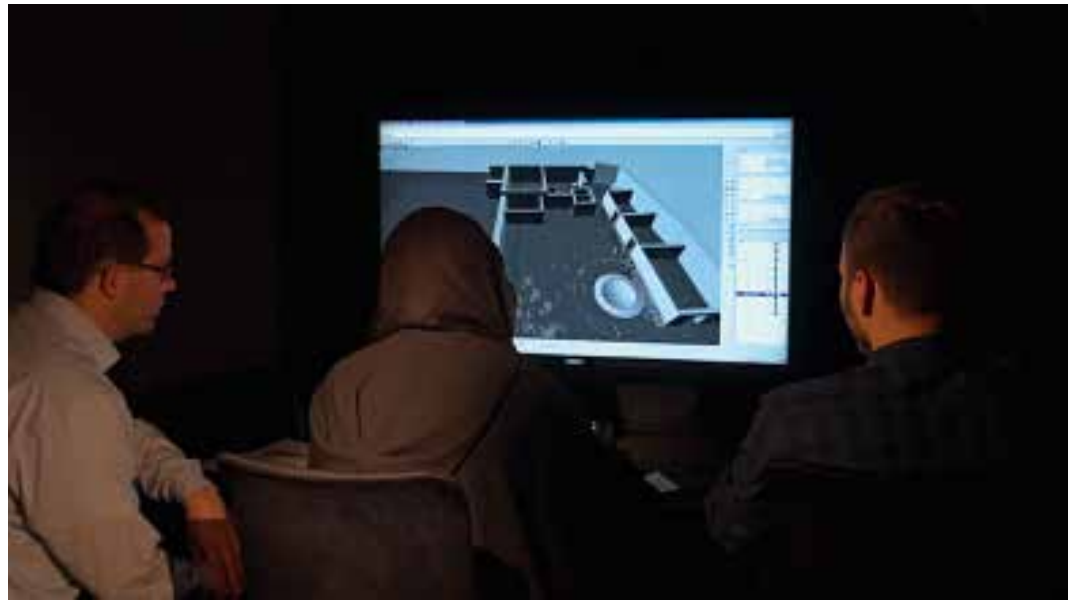
Unlike most drone strikes that had occurred up to this point, the attack on the jirga was roundly condemned by Pakistan's President, Prime Minister and the Head of the Army. Twenty-seven days later, American drone strikes resumed with an attack in South Waziristan. The CIA continues to deny that any civilians were killed in the attack of March 17, 2011.

Case Study No. 2: "The Architecture of Memory"
Mir Ali, North Waziristan, October 4, 2010

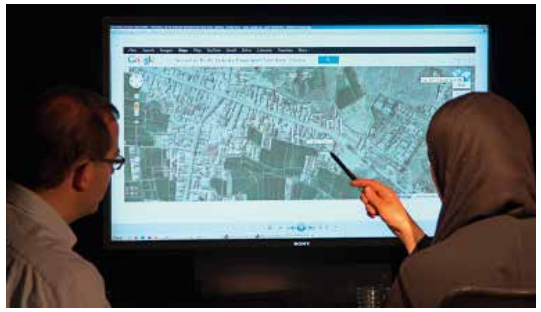


On October 4, 2010, a US drone struck a home in the town of Mir Ali, North Waziristan, in Pakistan, killing five people. One of the surviving witnesses to this attack is a German woman, who lived in the house [marked in the image above] at the time with her two-year-old boy and her husband.

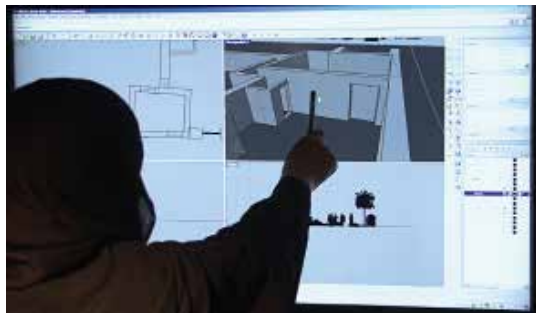
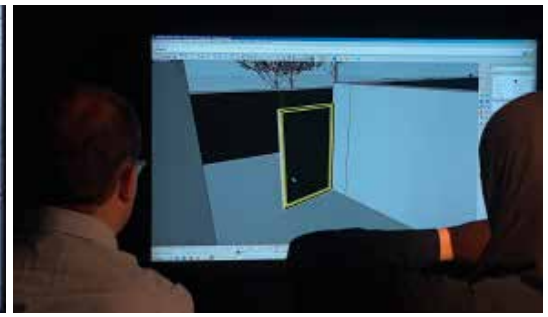
Together with Forensic Architecture, this witness built a digital model of her home, which no longer exists. During a day-long process of computer modeling, the witness slowly reconstructed every architectural element of her house. Placed virtually within the space and time of the attack, the witness was able to recollect and recount the events around the strike. The image shows a preparatory sketch.



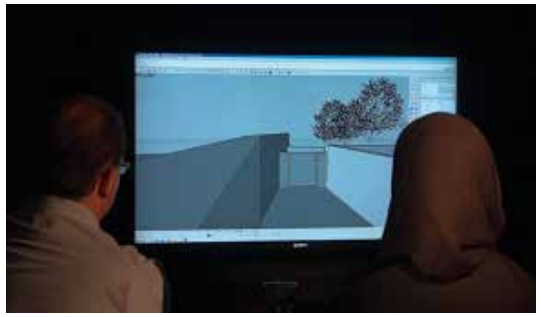
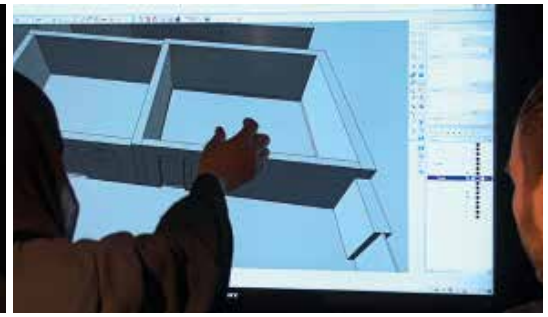
Our meeting took place in Düsseldorf, Germany, on May 21, 2013. The witness sat with her lawyer [left] and Forensic Architecture's model maker [right]. The woman—who prefers to remain anonymous—is hoping to communicate the realities of life under drones, and the experience of surviving a strike in which she also lost her brother-in-law.



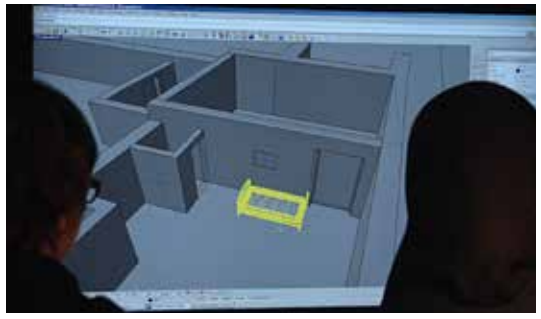

WITNESS: It was a small village with mosques and many other buildings. I know that the hospital was around here, and that the mosque was very close as well. I always remembered the plan of the house since I lived there for quite a while.

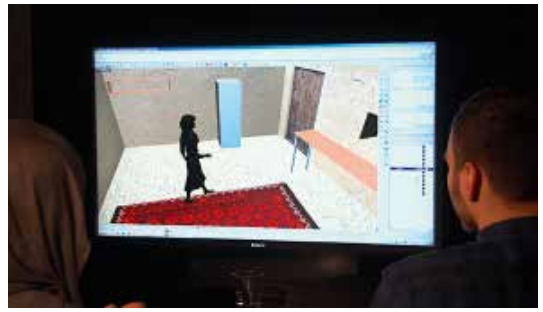
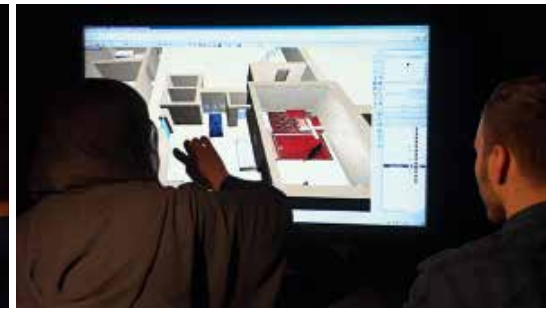
WITNESS: Here was a big heavy iron door like on the other side. Correct. I would widen it a bit more. Yes, it is okay like this. Stop. I now remember.

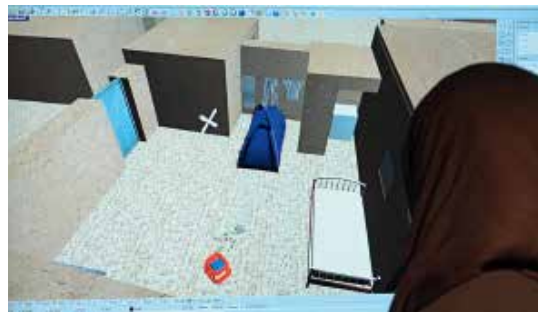
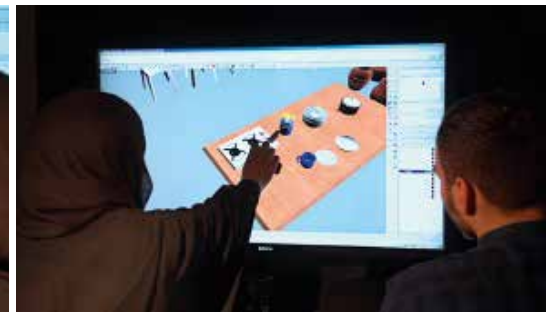
WITNESS: The door was over here and the window on this side. Can I see it from above?
LAWYER: Does this visualization help to remember what happened two and half years ago?
WITNESS: It helps me a lot. Without the plan I could have not remembered it like that.



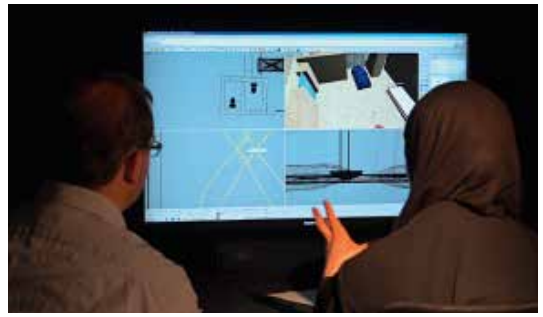
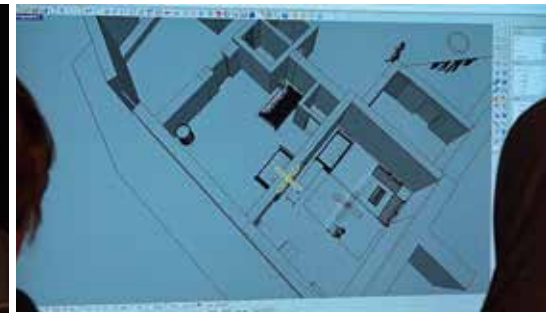

FORENSIC ARCHITECTURE: Those are different objects.
WITNESS: I would take the bed. Yes, we had it in the courtyard. I would move it closer to the door … yes, like that.

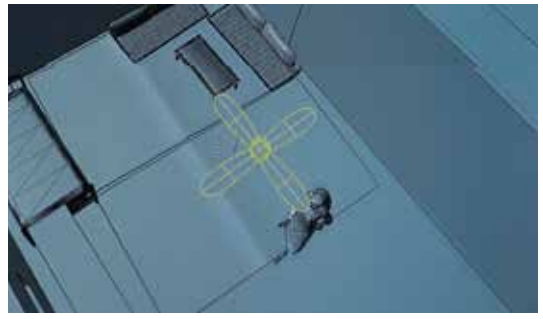
WITNESS: Inside we had two different types of carpets. We had mattresses on the ground and a wooden table in the middle. The big courtyard also had a carpet where we sometimes sat and played with the children.

WITNESS: On the day two German men were killed one of them had slept in a tent in our courtyard, but it was very small for him and his wife. We also had Lego. For cooking we used—I don't know the name—a gas cooker.

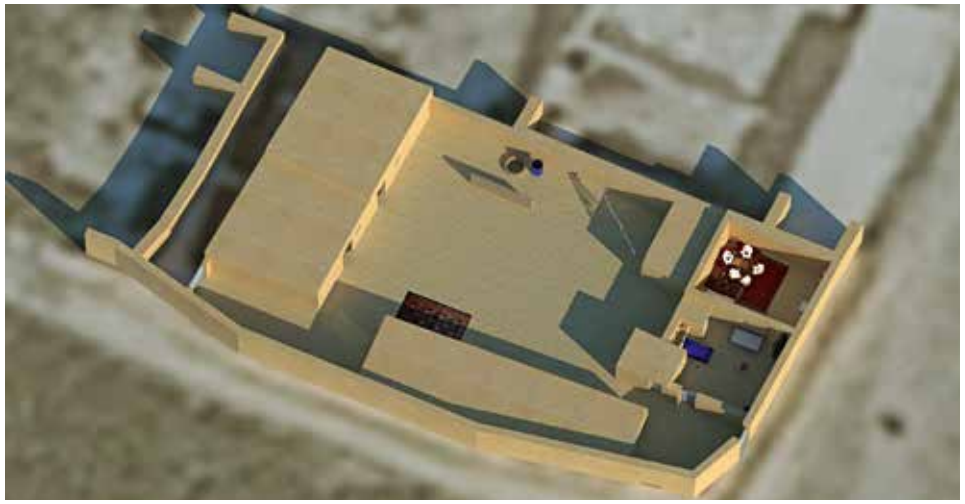



WITNESS: And a fan is still missing. Yes in the courtyard, at this position here.
LAWYER: A standing ventilator?

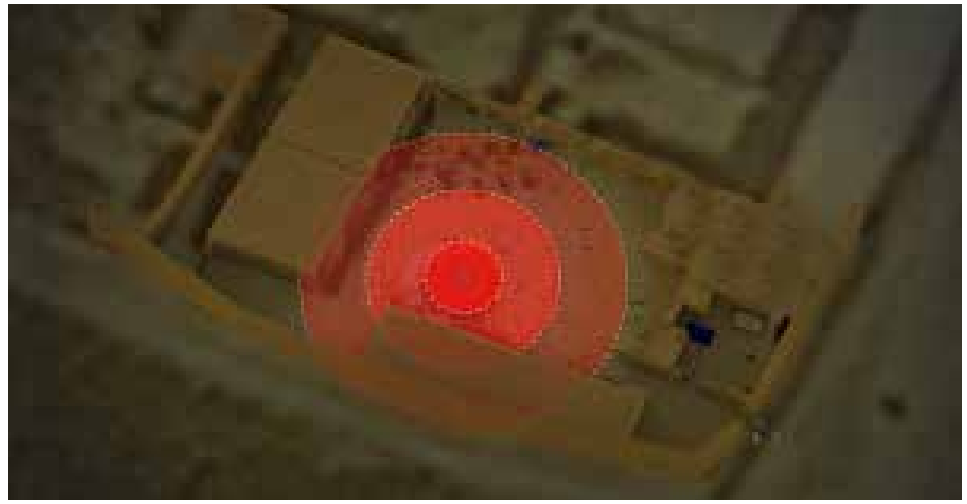


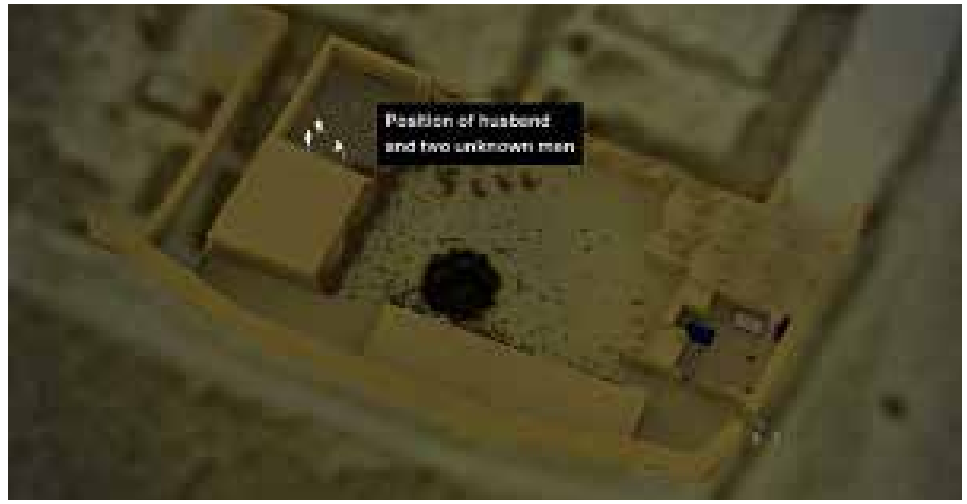

WITNESS: Yes, standing and with a round shape.
How do you call this … a walker … for my son?











WITNESS: You could always hear the noise of the drones very close at night and during the day further away.
LAWYER: In the night before the event could you hear them as well?
WITNESS: Yes, I could always hear them.
LAWYER: And then on October 4, what happened in the afternoon?
WITNESS: We all had breakfast together, then the men went shopping. They came back and then my friend and I started cooking. She cooked outside. I think I cooked inside on the worktop and sometimes I sat on the bed to read.

The men arrived around 6:00pm as the sun was setting. At this point the guests arrived as well. My son was still with the men while they were eating. Afterwards my husband brought him to me and said that we should take him and feed him. Then we started to eat.

WITNESS: We were eating, my son and my friend and I. And then it happened.

While we were eating we heard a very loud bang. The house shook, and lots of earth fell on us from the roof. First we looked at the ceiling because of the falling sand, then we got up and she [my friend] went outside first with me following. She slowly felt her way. Everything was covered with thick smoke.
LAWYER: When you met your husband, what did he tell you?
WITNESS: I asked about my brother-in-law and he told me that he is dead.
LAWYER: Where was he at the time of the strike?
WITNESS: Afterwards he told me he had been in the shelter to the right with two other men.



WITNESS: There was rubble in front of the houses.
A bit less. Yes, like that.
MODEL MAKER: And the slivers of metal?

WITNESS: Yes, they were like that and very small.
MODEL MAKER: So rather like that?
WITNESS: Yes, exactly.



LAWYER: When did you return to the house for the first time?
WITNESS: After the funeral. We went to the site afterwards to have a look again. But I know that other people had cleaned up the space a little bit. We went in and advanced slowly.

LAWYER: What did you see there?
WITNESS: At first a big black hole where the rocket hit. Basically the men were sitting here and ate, and they were attacked right here. On the inside it was completely black and the rim had stripes because the rocket burst. Lots was burned, pieces of cloth and metal from the rocket.



LAWYER: And where were they?
WITNESS: Everywhere. I can't tell exactly, everywhere there were bits, similar to the pieces of flesh of the three men, which were scattered everywhere. My husband found a hand at some point. I found burned pieces of flesh and hair in the fan. We collected these for the funeral and then I went to my house to get my belongings.



LAWYER: Did you return afterwards or never again?
WITNESS: No, never.

Among the five people killed in the drone attack of October 4, 2010, were Bünjamin Erdogan, Shahab Dashti, and three unidentified men. The house [shown here in a satellite image taken on March 13, 2011] was left deserted and has gradually crumbled away.



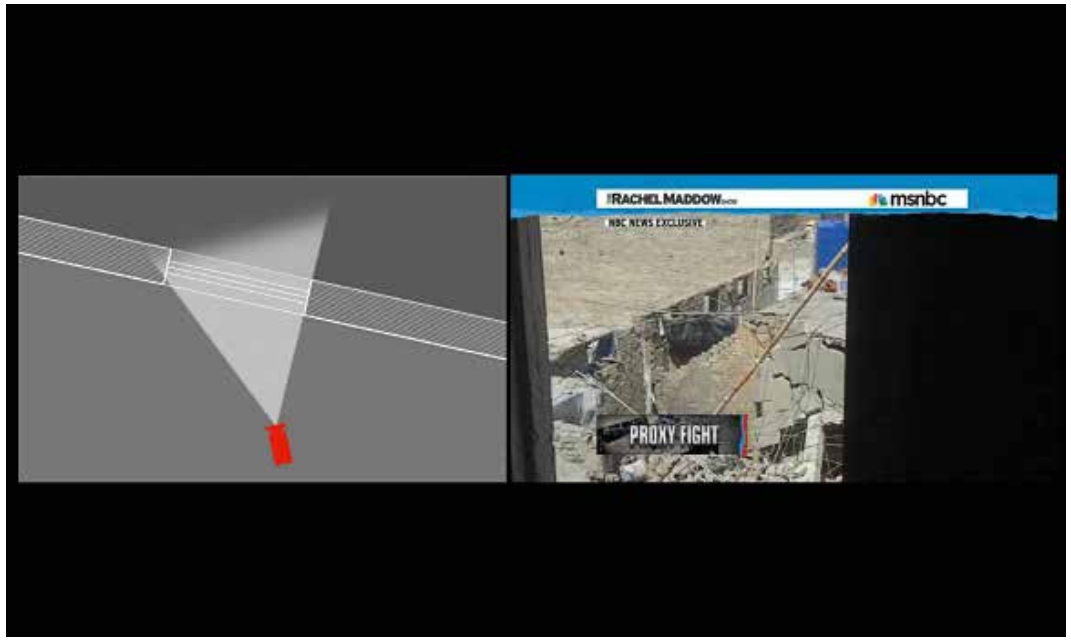
Case Study No. 3: "Decoding Video Testimony"
Miranshah, North Waziristan, March 30, 2012



This case analyzed video testimony smuggled out of North Waziristan, in order to reconstruct the space of the strike and interrogate the event. The video was originally aired by Rachel Maddow on MSNBC on June 22, 2012.



This footage revealed a great deal beyond what appeared to be chaotic images of rubble and ruin. In particular, it also shed light on the conditions involved in documenting such violent events in Waziristan.



The ruin appears very close; the videographer was not able to capture its full extent in a single frame. Careful to avoid the open space of the window, the videographer filmed from a certain depth within the room, moving backwards and forwards, left and right. His caution suggests that it might be dangerous to be seen filming the aftermath of a drone attack in Miranshah. This is precious evidence obtained under perilous circumstances.



The first stage in understanding what this footage could reveal was to locate the building within the city. The direction of the shadow helped to orient the structure. We determined that the videographer was standing level with the destroyed roof and must therefore have been in a building that was higher than the one that was targeted.

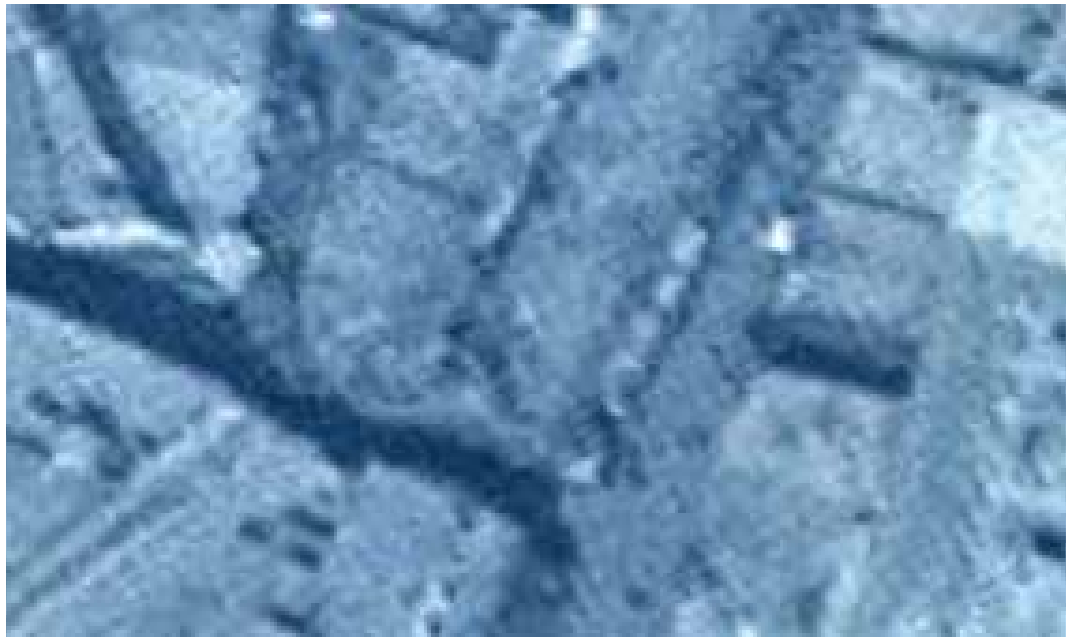
Using a collage pieced together from individual frames extracted from the footage, we eventually found the building within a satellite image of Miranshah, with the morphology of the streets as a guide.



Next we undertook a detailed comparison between the satellite image and the news footage. On the left side of the building we noticed a series of beams that fanned out in a radial pattern, and found the same radiating beams at the newly identified location on the satellite image.



In addition, both images depicted a tower to the left side of the building near the bend in the road. We could also make out a higher structure on the other side of the street from the tower. These spatial indicators allowed us to identify and match the location to the destroyed buildings depicted in the news footage.



We then turned our attention to the satellite image taken the day after the drone strike [March 31, 2012]. Each pixel represents about a 50 x 50 cm square of terrain, which is the resolution that publicly available satellite images are degraded to in order to preserve the visual advantage of militaries and state agencies.



The destruction was thus captured at the threshold of visibility in the image. Might this cluster of pixels represent a destroyed roof, cluttered objects, or the entry hole of a missile?



Upon a detailed examination of all available satellite imagery as well as a bird's-eye view, we sketched out the probable contours of the building.



By analyzing the length of the shadows cast from buildings in the image we were able to determine the different volumes of the structure, as the length of a shadow is relative to a structure's height. Using this information, we built a computer model of the building both before and after the strike.



Animating the shadows cast on different days and at different times enabled us to compare our model with the shadows visible in the satellite and video images, to corroborate its volumes as well as to determine the approximate time—3 p.m.—that the video was shot.



The MSNBC video footage also depicted other locations. In particular, it also showed the destruction of a still unidentified empty room.

Returning to the satellite image of June 2012, we identified 4 to 6 awnings on the right side of the building. Given the location of the awnings we were able to assume the location of the shop units outside the structure. One of these shops might be the empty room depicted in the video footage.

In order to build a model of the interior room targeted in the attack we needed to deduce its proportions from an analysis of the video footage. A large hole is revealed at its center. It is similar to the entry holes of drone-fired missiles.

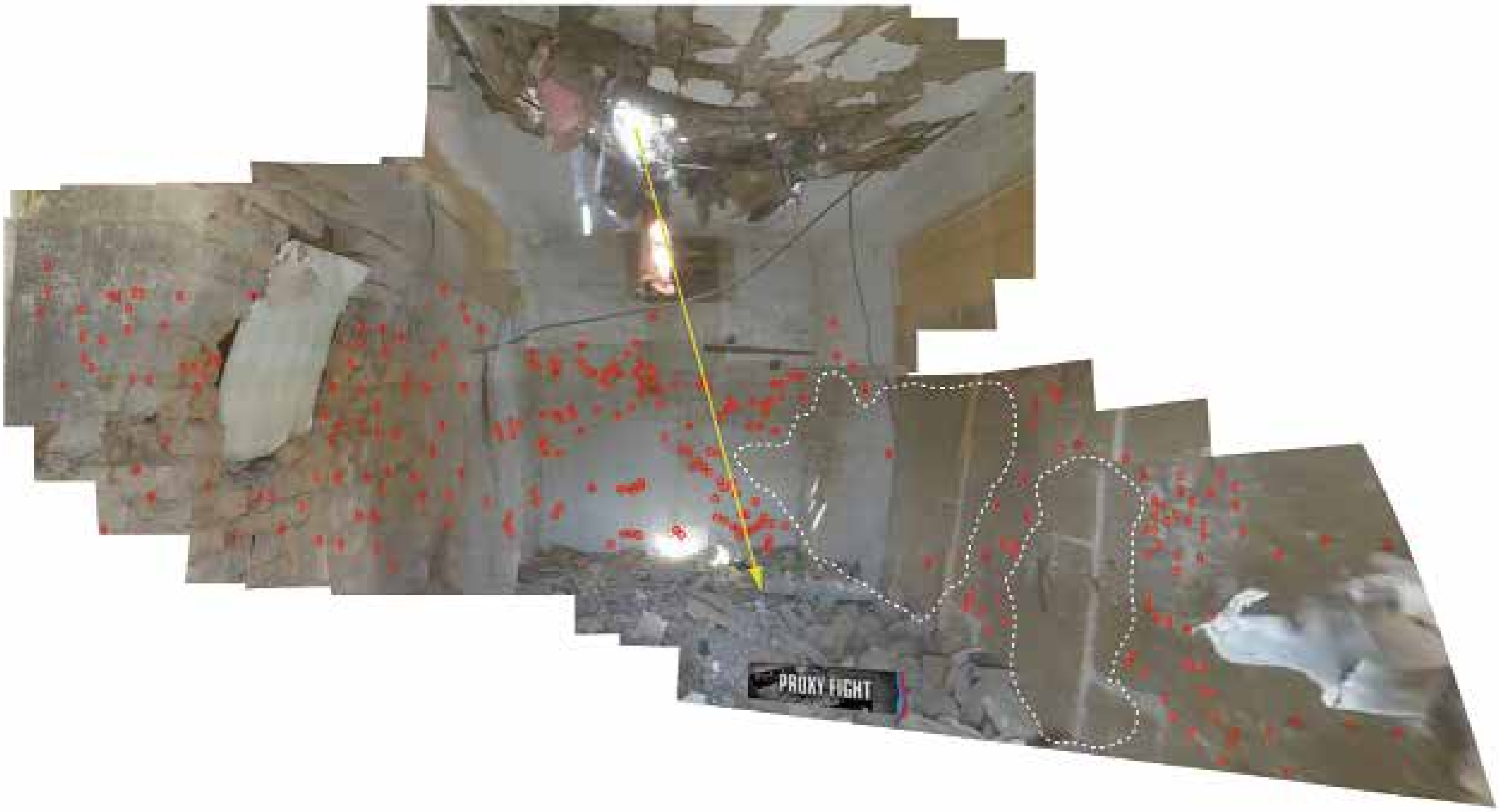


Smaller cracks generated by the impact are also visible in the ceiling. Each of these holes is smaller than the 50 cm square, which is the size of a single pixel from the satellite images we obtained. The violation is thus below the detectability of a publicly available satellite image. Might the hole in the ceiling be hidden somewhere within the pile of rubble?

Using the entry hole of the missile, and the light that streams through it as a compass, we found the orientation of the room, and calibrated the model to the time when the interior video was shot.



Inside the room, we could see a man holding what seemed to be a fragment of ammunition. Taking a closer look at this object, we compared it to missile fragments bearing serial numbers collected in the office of Pakistani lawyer Shahzad Akbar. Each missile breaks differently after impact. Features similar to those in the identifiable samples are noted.



Behind the missile fragment we noticed a trace on the wall. The room was full of such traces. They seem to be fragmentation patterns from the explosive head of the ammunition. The missile is designed to penetrate through a ceiling, and detonate when inside a room, spraying hundreds of steel fragments and killing everybody in proximity. Each fragment was studied and mapped.

Where the distribution of fragments is in lower density, it is likely that something absorbed them. Although we could not be certain, it is possible that the absence of the fragments indicated the places where people died.



Case Study No. 4: "Warnings That Kill"
Beit Lahiya, Gaza, January 9, 2009



In the early hours of January 9, 2009, an antitank missile was fired at the Salha family home in Beit Lahiya, Northern Gaza. Its hollow charge penetrated the roof, entered one of the rooms, and impacted the floor leaving a small hole. Three minutes later a bomb struck and destroyed the house. Six people were killed, all women and children.

This strike exemplifies a new strategy adopted by the Israeli military referred to as "knock on the roof." It is one of several methods used to alert residents of an imminent attack. Israel makes much of the fact that it tries to warn civilians of impending bombings. Warnings take the form of telephone calls or text messages, informing the inhabitants of the imminent destruction of their home. They can also take the form of leaflets dropped from airplanes; warning shots; or the firing of a nonexplosive missile.











When receiving such warnings, the inhabitants of a house need to make a choice—they can either leave the house and risk their lives in the streets, or remain in the house. If they remain, their status changes in the eyes of Israeli military lawyers. According to their interpretation of the law, if a warning has been issued and not heeded, the victim might no longer be considered as a "noncombatant" but rather as a voluntary "human shield." Their killing is thus considered to be "justified collateral damage."

Warnings could save a life, but the Israeli military has also used this tactic to legally justify the application of overwhelming military force in built-up areas.

[Leaflet translation]

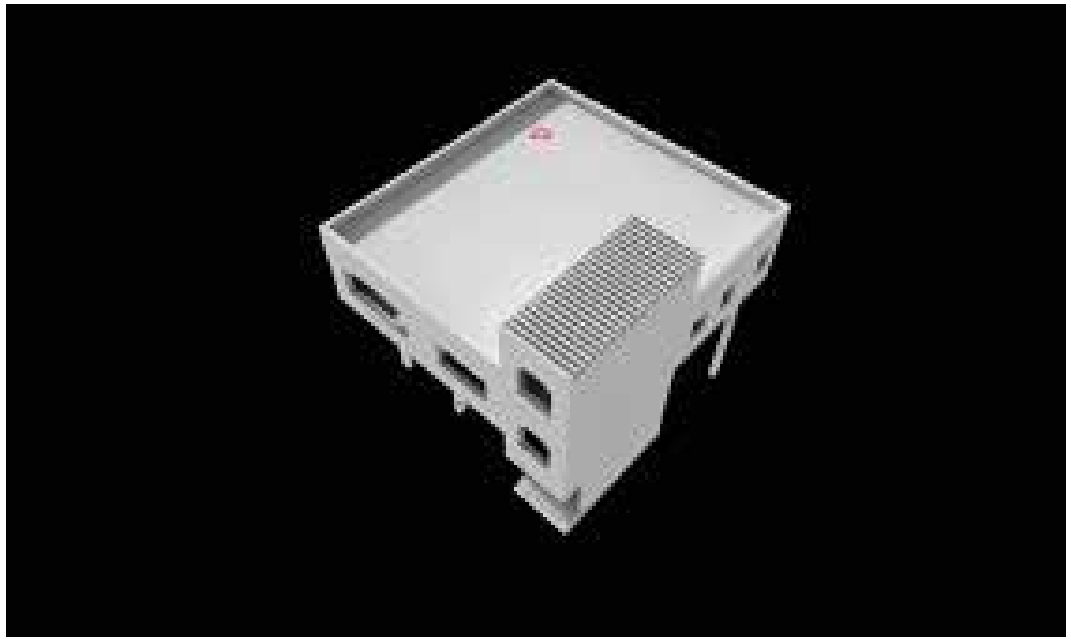
An important statement for Gaza population
For your own safety, be responsible about your own destiny.
Avoid being near Hamas members and their locations.
This will endanger your life. Yet again Hamas is leading the region into a military escalation and a slaughtering.
The IDF is determined to protect the population of the Israeli state, whenever it is needed. This statement is valid until the region is back to normal.
Commander of the IDF





On August 28, 2013, Forensic Architecture interviewed two of the surviving members of the Salha family in Gaza by live satellite link from the Al Jazeera English studios in London.

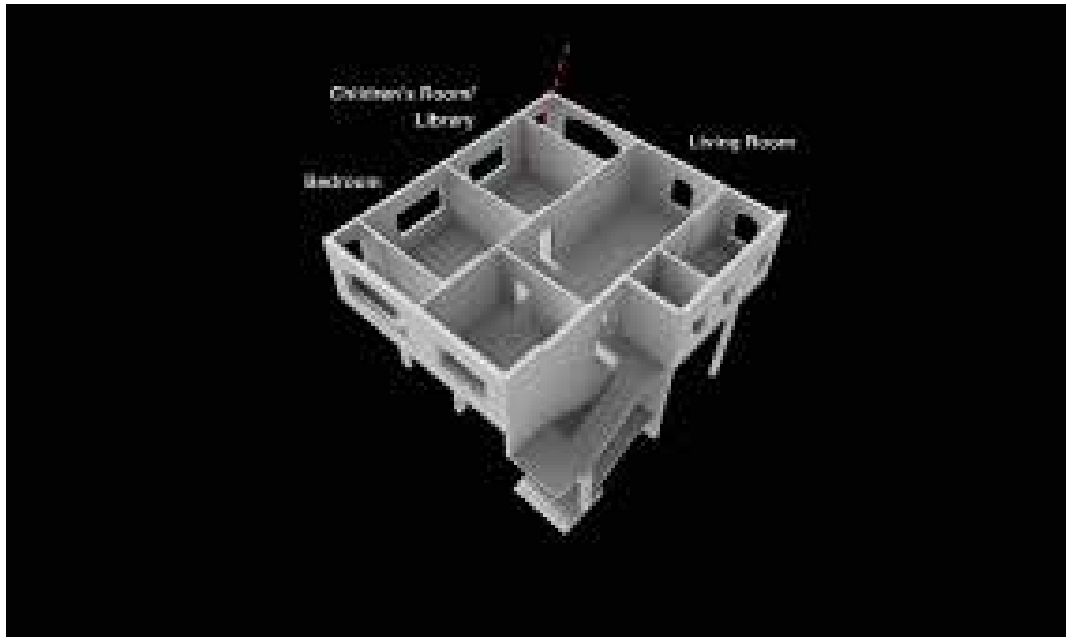
Fayez Salha and Noor Salha, his son, have been attempting to bring their story to public attention and obtain redress for their loss. With the family's help, we built a detailed model of their home.



FAYEZ SALHA: It was Thursday and I went to my night job as a security guard at one of the agency schools. I went in the evening, at sunset.

This is a living room, 4 by 4 by 4 meters, this is a bedroom, this is the children's room. This is the living room where it's possible to sleep in.

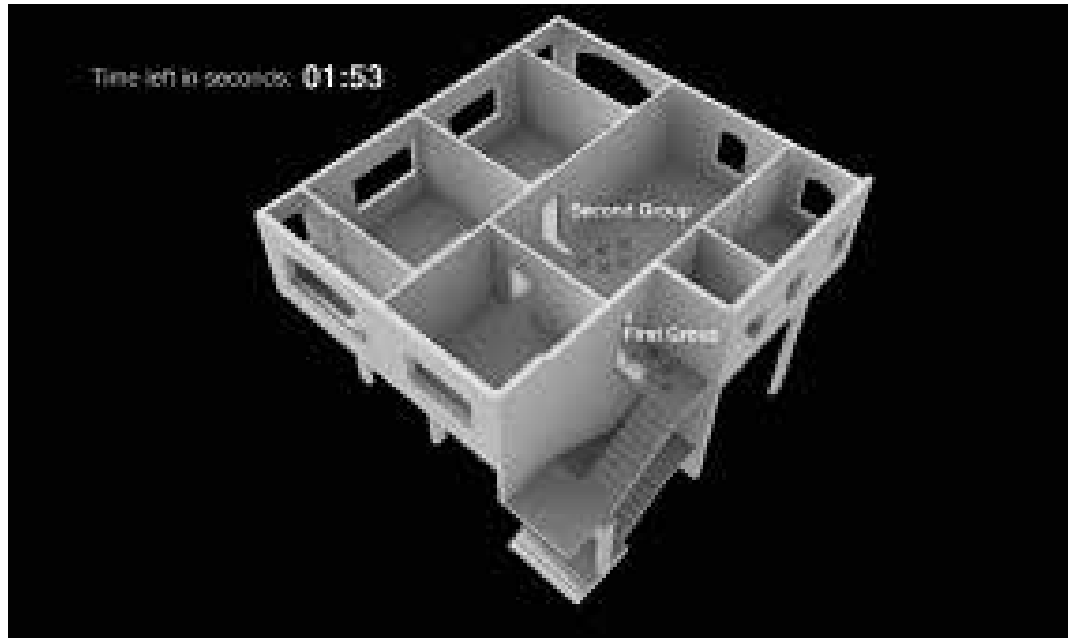
The family were all sleeping despite the fact that Gaza was under attack. At 3:00am a warning missile was fired at the building. Rather than only shaking the building, it penetrated through the roof and entered one of the rooms. Noor realized that the noise had not come from outside when he saw smoke coming from the library.



NOOR SALHA: There was the sound of a loud explosion, and then we exited the house. Of course, these were moments of fear.

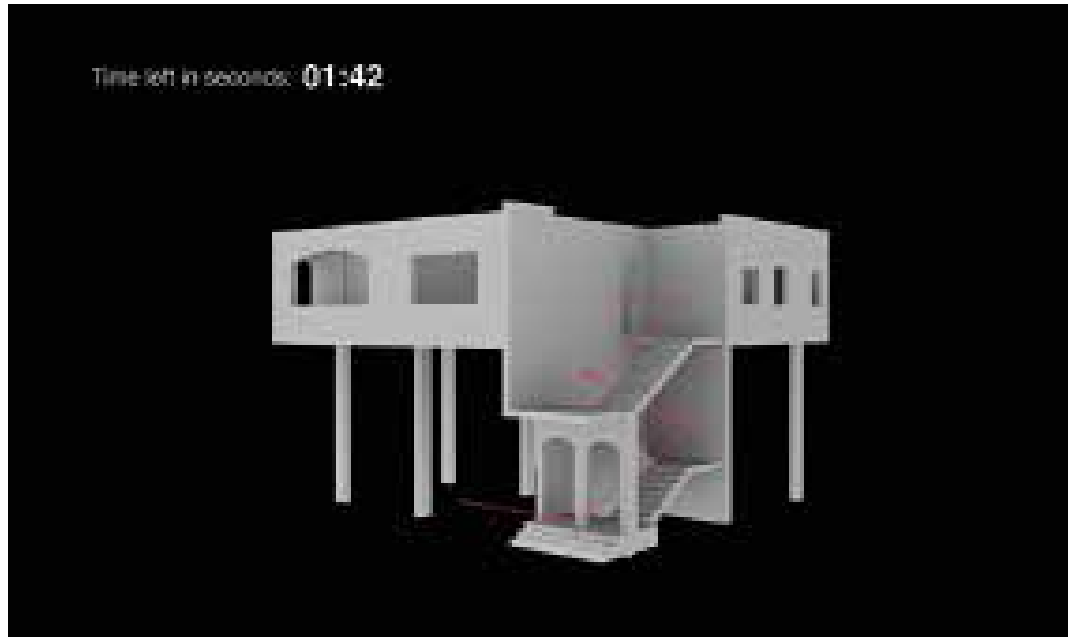
FORENSIC ARCHITECTURE: So, the family was familiar with this kind of strike being used as a tactic?

FAYEZ SALHA: No, not at all, there was no warning whatsoever, no message or phone call of any sort. And you can check that by consulting with the existing telephone network companies.



NOOR SALHA: No actually, this is almost the first time we saw this. Of course I realized this was a warning strike after the missile fell.

While the father understood the meaning of the warning strike, it was not clear to the rest of the family that, from the moment of impact, their status as civilians had changed and that they needed to make some crucial decisions. The family did not know that the warning strike left them with barely three minutes to leave the house before it was to be bombed and destroyed.



FAYEZ SALHA: She [Noor's mother] called me on the telephone and told me that the house had been hit, so I told them to get out of the house and head towards the closest school. I wasn't present in the house, but from the first phone call until I tried to call them again it was a very, very short period, maybe one minute. It is very likely that it was one minute.

The family gathered by the stairs, ready to leave, but, according to Noor, his mother wanted the family to separate into two groups. The reason for exiting in two groups was the family's fear that larger groups moving at night might be seen as suspicious by the Israelis and targeted. Noor left the house with four of his relatives, but his mother stayed behind.







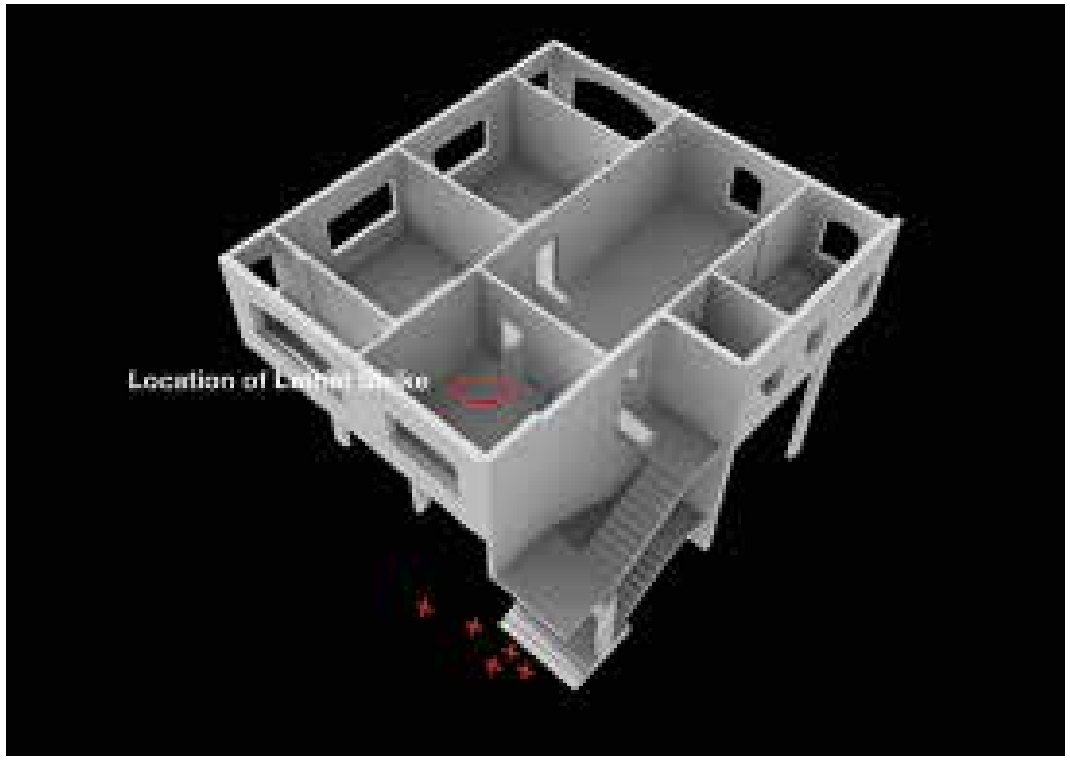




NOOR SALHA: After the missile fell, me and the people with me went this way until we went out through the stairs. After that I headed towards the west, then I headed north.
FORENSIC ARCHITECTURE: What is very critical in this investigation is really to know the timeline. Can you estimate the time that had passed between the strikes and where everybody was during each stage of the evacuation process?

NOOR SALHA: The time between the first and the second strike was approximately 180 seconds.

The mother and two children were outside the house. The mother was called Randa, and the two children Baha' Edin and Rola.

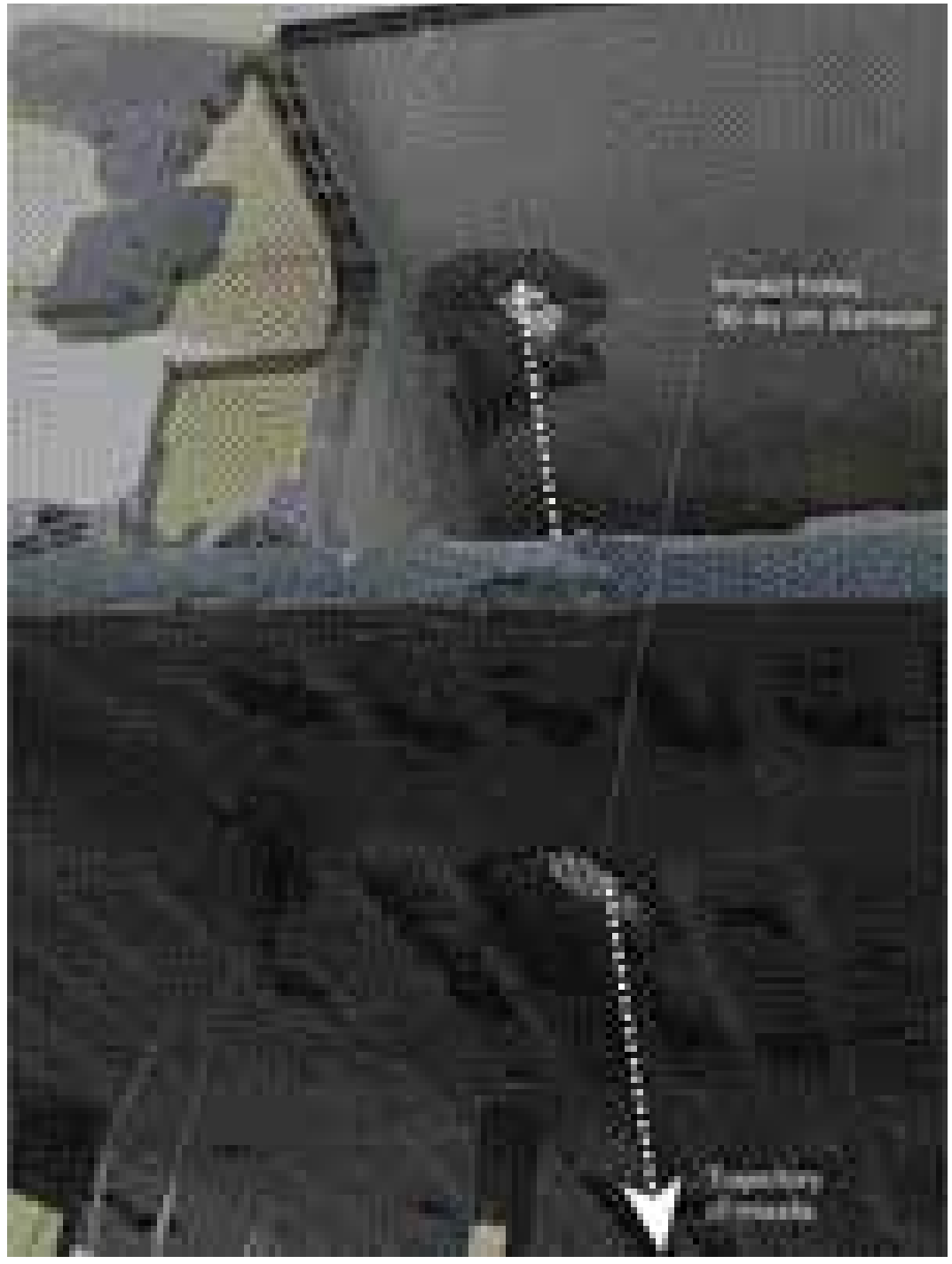


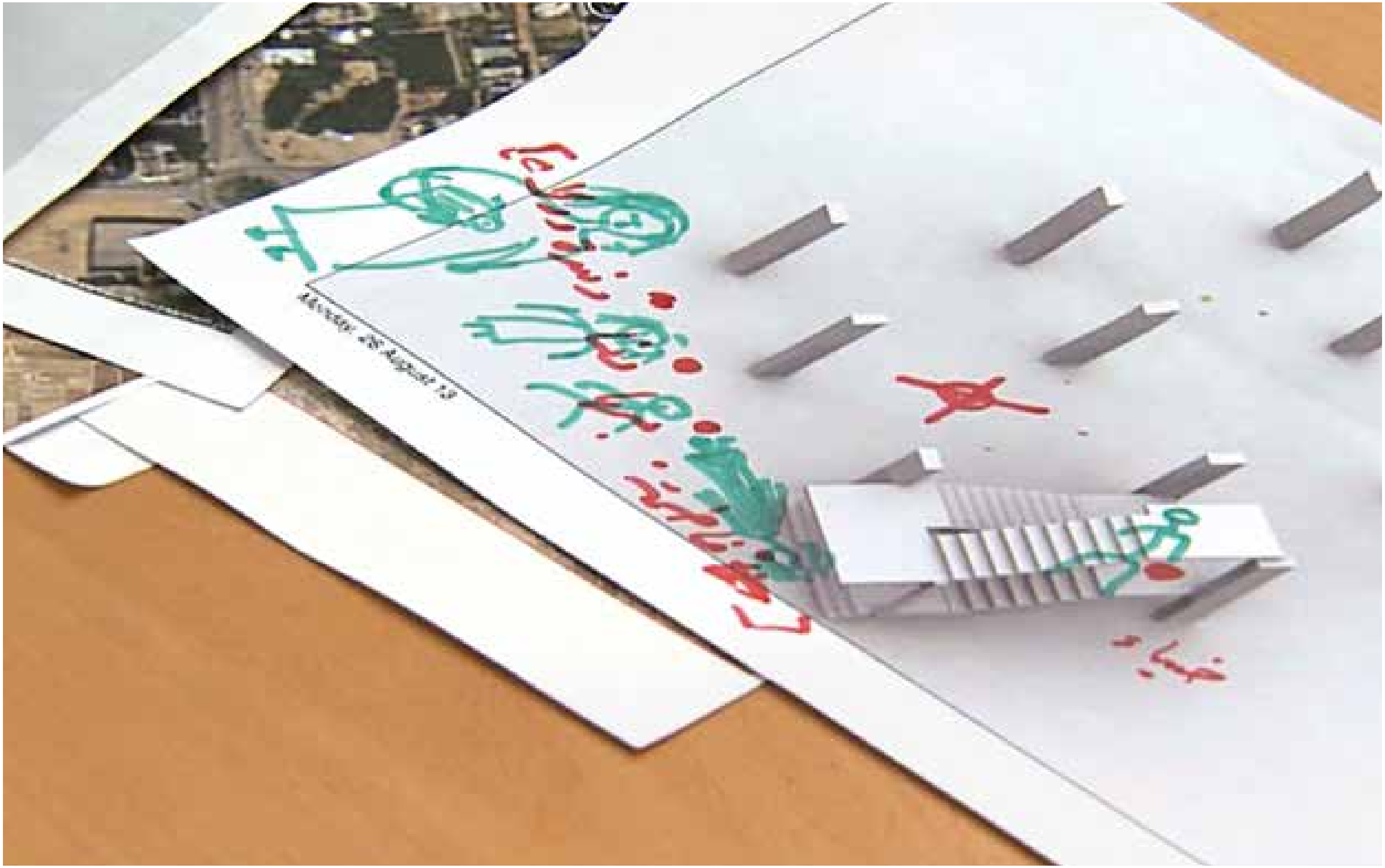
NOOR SALHA: First of all, there were indeed two groups, at the request of the Zionists who insisted there be no more than five or six people grouped together in the street at one time. After the first strike I went down and out of the house with whomever was with me. There were four people with me, and I was the fifth.

The Israeli army asked all the inhabitants of the Beit Lahiya and Atatra to evacuate and head elsewhere, so the people were heading in large numbers to the Jibaliya camp.

When the first group was 50 meters away from the building, the second group was only getting organized to leave the house. They had just reached the bottom of the stairs when the bomb struck the building.

NOOR SALHA: The sound of the second strike was very loud and strong, to the point that it shook the buildings next to the target.





Two women, Randa and Fatma, and four children, Diya', Rana, Baha', and Rola, were killed.

The Salha family petitioned the Israeli Court for justice, but their case was dismissed. The court ruled that the state is not liable for consequences resulting from an act of war. No one was charged with the destruction of the Salha family and their home.

1 In Afghanistan, the al Qaeda military chief Mohammed Atef al-Masri was killed in a drone strike in Kabul on November 14, 2001. Mark Hosenball, "The Opening Shot," *Newsweek*, November 17, 2002. Abu Zubaydah records in his recently released diaries that someone marked the house with an electronic chip—an early example of a tactic that would come to be used widely in FATA. Jason Leopold, "Zubaydah diaries shed new light on Twin Towers and links to bin Laden," Al Jazeera America, November 12, 2013.

2 For example, Chris Woods noticed that, in the original reporting, it was stated that rescuers were being targeted, yet these reports were not being commented upon. This led to a further investigation (and revelatory new reports) by the Bureau. See Chris Woods and Christina Lamb, "CIA Tactics in Pakistan include targeting rescuers and funerals," Bureau of Investigative Journalism, February 4, 2012, http://www.thebureauinvestigates.com/.

3 Information, especially in regard to the locations of strikes, came from different sources and was often inaccurate and contradictory. Journalists are reliant upon their sources and information can reach them third- or fourth-hand. Because our results are based on figures, which could vary from one report to another, we followed BIJ in using ranges (which were sometimes as broad as one to five houses hit in a specific strike). For example, of the 220 strikes that were reported to have hit at least one house in the period covered from 2004 to August 1, 2013, 148 reported certain information regarding the structural damage that the missile had caused, while 128 strikes cited a homeowner's name.

4 Because of the strict separation between women and men from different families in Pashtun culture, we believe that the number of women civilians reported killed in houses may be significantly lower than the true number, thus affecting the overall statistics.

5 The videos can be viewed at http://www.forensic-architecture.org/investigations/drone-strike-visualisations/.

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Unless otherwise stated, all images are by Forensic Architecture.

pp. 420–21: Forensic Architecture and One World Research.
pp. 422–23, 428–29, 434, 441–42, 445–46: Satellite images by DigitalGlobe.
pp. 424–432, 444–454: Forensic Architecture and SITU Research.
p. 425: Portal de Peshawar, http://www.pukhtoogle.com.
pp. 426–27: Satellite images by Google Earth.
p. 433: Anjum Naveed/AP Photo.
pp. 443–44: MSNBC.
p. 451 (bottom): Edmund Clark.
p. 456: Al Mezan.
p. 457 (top): Amir Cohen/Reuters.
p. 457 (bottom): Israeli Defense Forces.
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Panorama of Destruction: The Story behind the Aerial View of Homs

Emily Dische-Becker and Hisham Ashkar

> It may be that the quality of photographic transparency, once presumed dead, has simply shifted from the picture to the picture maker. In such a practice, subjectivity and truthfulness are no longer at odds, and the acknowledgement of point of view is itself a precondition of photographic honesty.
> — Marcia E. Vetrocq[1]

On July 28, 2013, following an eighteen-month siege by regime forces and weeks of intense clashes, the al-Khalidiya neighborhood of Homs, which had



Fig. 1. The aerial image that went around the world.

been under the control of opposition fighters, was recaptured by the Syrian army. Syria's third largest city, Homs had largely fallen off the international media's radar since the early spring of 2012, when rebels lost a months-long battle for control of the Baba Amr neighborhood.[2] Since July 2012, after opposition forces launched a campaign to capture Aleppo, foreign journalists entering Syria through Turkey have largely been converging on the northern city, as well as opposition controlled areas in Idlib province.

On July 27, after regime media announced that they had "secured" al-Khalidiya, aerial images surfaced which for the first time evinced the colossal scale of destruction.

Throughout the siege, local photographers and photography collectives such as Lens of a Young Homsi have been uploading thousands of street level images from Homs, revealing entire blocks reduced to rubble. And a few days before al-Khalidiya fell to regime forces, images circulated on social media sites showing the eleventh-century Khalid ibn al-Walid mosque billowing smoke and exhibiting extensive damage.

But the aerial images, taken from an estimated height of 120 meters[3] and capturing an area spanning at least 0.6 square kilometers, put those individual snapshots into perspective: as far as the eye can see, entire swaths of the city have been laid to waste. Dusty unpaved avenues, shell pocked crumbling structures, not a soul in sight.

The aerial shots were picked up by international news media and credited to AFP/Getty Images.[4] But nowhere was any mention made of how and by whom these images were obtained.

Did the regime take these photos and circulate them? Do opposition forces have airborne surveillance capabilities, commercial or otherwise? And which area are we in fact seeing?

The Trajectory of Circulation

Some aerial views purporting to show al-Khalidiya appear to have first been published on July 27 on the Facebook page of the local Bab al-Sbaa media center, and later that day, again on Facebook, by al-Khalidiya Local Coordination Committee, using the logo of Bab al-Sbaa media center.[5]



Figs. 2–4. Aerial images published by Bab al-Sbaa media center on Facebook, July 27, 2013. The captions accompanying the images read "Pictures taken from a downed drone."

Two days later, on July 29, different aerial shots of the same area were circulated by the opposition Shaam News Network (SNN) as part of a series of aerial images. Some are captured from a lower altitude and reveal the shadow of a drone on the ground (see fig. 18), as well as a number of men who appear to be looking up (and one man who seems to be operating the drone; see fig. 19). The SNN caption states that the images specifically depict al-Khalidiya—the neighborhood that had just fallen to Assad forces.



Figs. 5–10. Aerial images published by Shaam News Network on July 29, 2013. http://www.shaam.org/.

Three of these images from SNN, which is headquartered in the US,[6] were picked up by AFP/Getty, watermarked, and subsequently republished by international media outlets.



Figs. 11–13. Aerial images published by AFP/Getty Images on July 29, 2013. www.afp.com.

Credits: Origin Obscured

Most western media, including the *Daily Mail, Libération*, and *The Independent*, attributed the photo only to AFP/Getty; others, such as NBC News, gave no credit at all.[7]

For its part, AFP stated specifically that "mandatory credit be given to AFP/HO/Shaam" and that AFP is "using pictures from alternative sources as it was not authorised to cover this event, therefore it is not responsible for any digital alterations to the picture's editorial content, date and location, which cannot be independently verified." The caption reads:

> SYRIA, HOMS : A handout image released by the Syrian opposition's Shaam News Network on July 29, 2013, shows an aerial view of destruction in the al-Khalidiyah neighbourhood of the central Syrian city of Homs. Government forces bolstered by Lebanese Shiite militiamen were poised to retake the largest rebel-held district of Syria's third city Homs, a watchdog and state media said.[8]

In its caption, AFP did not include SNN's claim that the images were taken from a downed regime drone. In fact, AFP appears to have cropped the original shots without mention (as the digital alterations—cropping—do not appear in the images published by SNN, thus removing the two loops in the upper corners of the original shots).

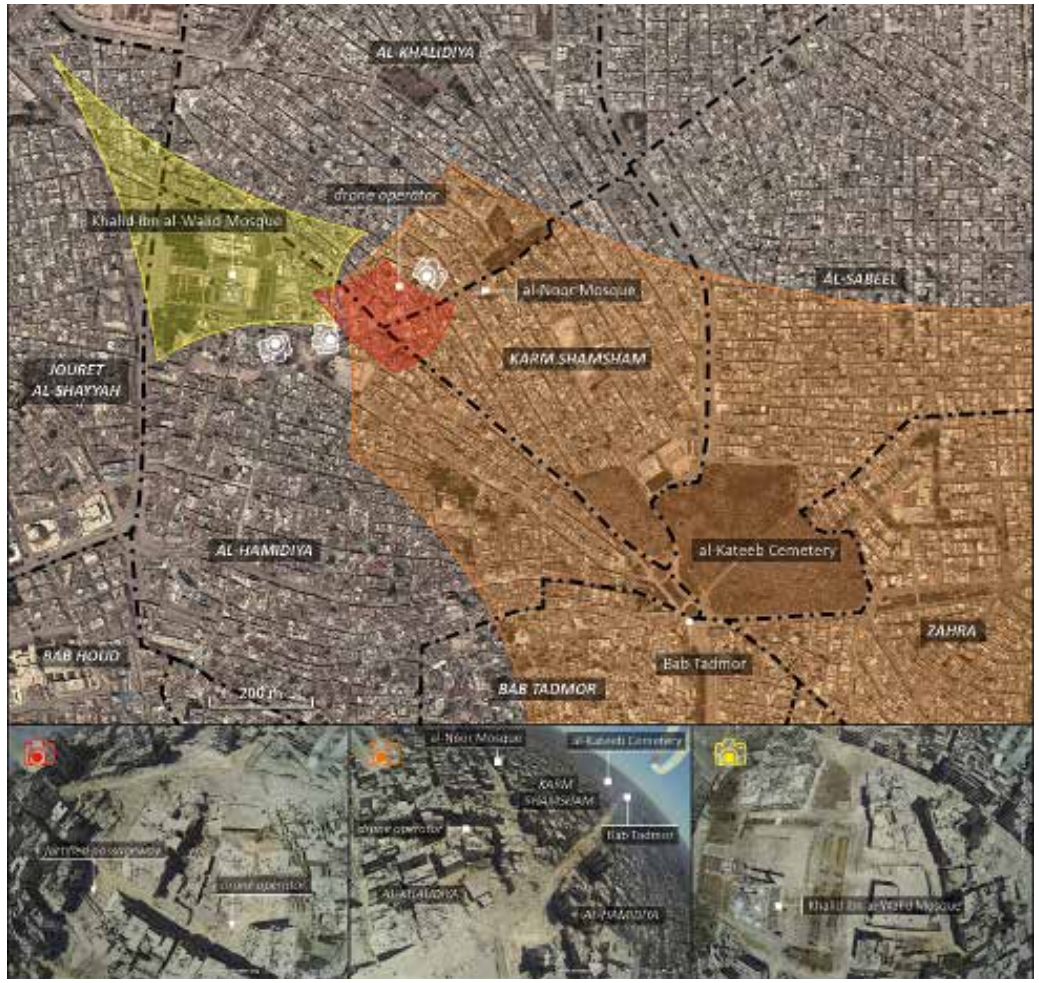


Figs. 14–16. AFP/Getty images superimposed over original Shaam News Network images, showing cropping. Image annotation: Hisham Ashkar.

Which Area are we Seeing?

Fig. 17. The aerial images' field of view transposed onto an annotated satellite image of Homs. The distance between the drone's position and Bab Tadmor seen above is approximately 900 meters, as the crow flies. Image annotation: Hisham Ashkar.

These circulated aerial shots purport to show al-Khalidiya district. This is incorrect. After locating the area captured in the aerial shots on Google Earth (this was done by the authors by scanning the areas around the Khalid ibn al-Walid mosque and using as a reference the road network and mosque that appear in the photo) and comparing these to approximate district borders, it turns out that most of the area seen in the aerial view is from the Karm Shamsham neighborhood, as detailed below.



The SNN caption accompanying the image (fig. 18) reads: "Members of the FSA amid the destruction in Khalidiya neighborhood, as seen from the drone lens shot down by the FSA." But in a video uploaded on July 27 by Bab al-Sbaa media center—the group that first published the aerial images—an on camera presenter claims (although no evidence is offered) that the men are Iranian operatives and *shabiha* (regime thugs).[9]



Fig. 18. Screen capture of an aerial image published by SNN on July 29, 2013 in which armed men are visible.

A closer look, corroborated by both regime and opposition reports indicating that the Syrian army had taken over the depicted area well before July 26, leads us to believe that the men are in fact uniformed Syrian army soldiers. One of them appears to be commanding the drone while the others are looking up. Another uniformed man visible on the bottom left hunched over a laptop may well be receiving a live feed of the images captured by the drone.

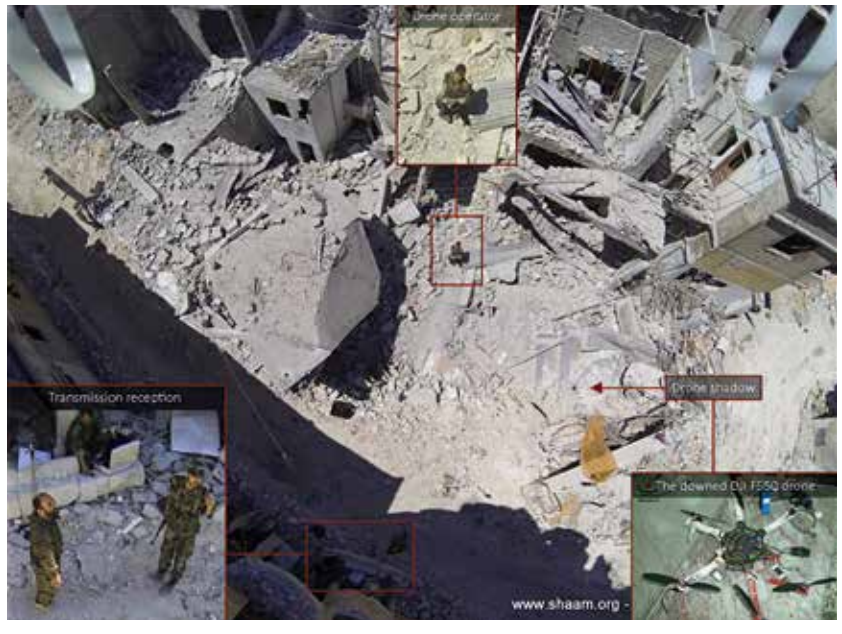
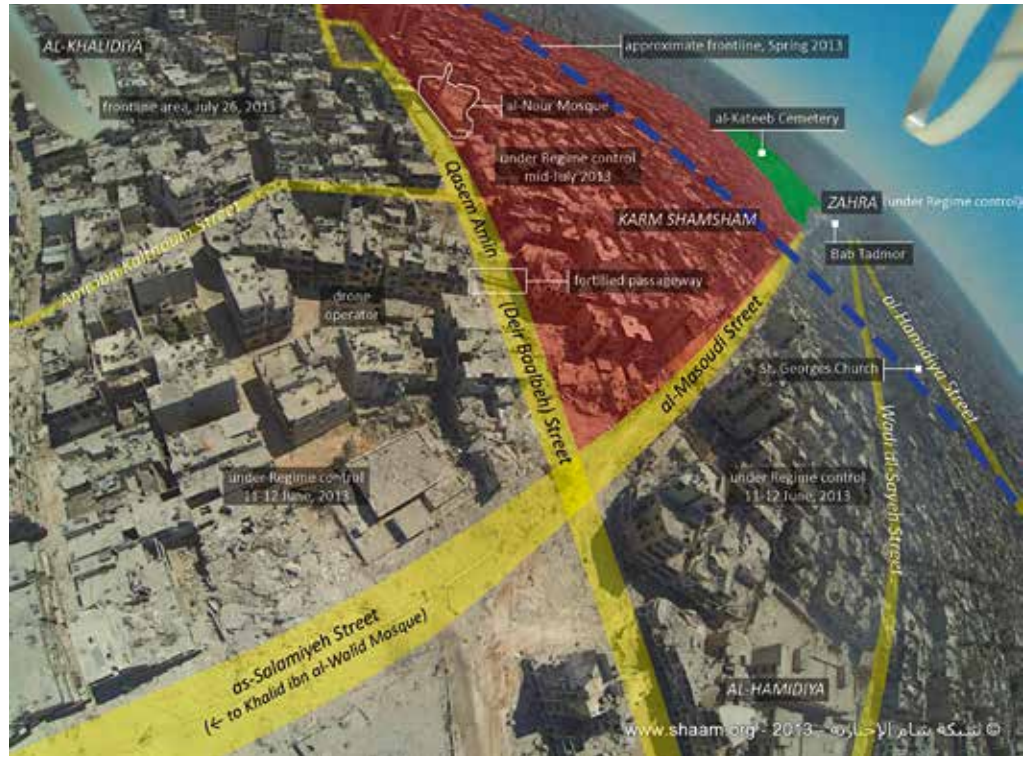


Fig. 19. Close-ups of the men visible in an aerial image published by SNN show the presumed drone operator, transmission recipient, and shadow cast by the drone. Image annotation: Hisham Ashkar.

Background: Who Was in Control of the Area?

The drone operators are located at the edge of Karm Shamsham, next to the intersection of as-Salamiya and Qasem Amin Streets, an area that was taken by the Syrian army on June 11–12, according to the Lebanese daily *an-Nahar,* citing the opposition Syrian Observatory for Human Rights and the regime affiliated *al-Watan* newspaper.[10] For over a year, Karm Shamsham was the frontline in battles between opposition and regime forces: the western part was controlled by the rebels, while the eastern part (towards Zahra district) was controlled by the Syrian army. As for al-Nour mosque and its surroundings, contradictory statements from pro-regime and pro-rebel sources were made on July 7–8 about who had won the battle around it. Dated July 16, another video from the opposition Karm Shamsham media center shows the mosque and states that it has been occupied by Assad's forces.[11]

Fig. 20. Annotated aerial shot of Homs depicting the progression of regime forces' control, in June–July 2013. Image annotation: Hisham Ashkar.



How the Images Were Taken and Obtained

In the Bab al-Sbaa media center's clip, as well as in a second video from the Commission for the Protection of Civilians (Hay'at Himayat al-Madaniyin),[12] two men are seen displaying the downed commercial drone and attached camera from whence the images were taken. The presenter says the drone was shot down on July 26 in al-Khalidiya by the al-Ikhlas Brigade. In the

second video, they mention that the drone is an F550 model (also visible on the drone's shell at 01:26), and that it was downed by elements belonging to Hay'at Himayat al-Madaniyin (which al-Ikhlas is a part of, according to a document posted on Facebook).[13]

In the video, one can make out that the drone controlled equipment is an LK900 ground controller station. The camera appears to be a GoPro HERO 3; the images were taken using a fisheye lens. The LK900 is visible on the downed drone equipment, and the fisheye lens is obvious from the characteristic hemispherical distortion. The F550 is a commercial drone manufactured by DJI Innovations headquartered in Guangdong, China (with a DJI America subsidiary based in Austin, Texas). On its Facebook page, the company describes itself as "the global leader in developing & manufacturing high performance and easy-to-use small unmanned aerial systems for commercial and recreational use."[14]



Fig. 21. Photo of the downed DJI F550 drone published on Bab al-Sbaa media center's Facebook page on July 27, 2013.

Photojournalism Requires Journalism

In a conflict where information is as heavily contested as Syria, photo agencies ought to investigate, verify, and provide consumers with information about the origins of images, rather than opting for a generic disclaimer and surreptitiously cropping out indications of how an image was taken.

When basic questions surrounding an image are left unanswered, the vast destruction of entire neighborhoods in Homs, which these images uniquely attest to, is rendered contestable.

Furthermore, news media that republish images from photo agencies habitually obscure their origins by ignoring mandatory credit guidelines. Thus, the credits for unverified images that were picked up by photo agencies from anonymous activists are abbreviated, scrubbed of the original source, and repackaged, misleading viewers into believing the agencies themselves or official contractees supplied the image.[15]

Verification requires time and effort, but it mitigates uncertainty. A further murky element in the process of distributing images from Syria entails the widespread practice by western photo agencies of attributing photos to generic pseudonyms, without mentioning that these names aren't real. While readers might presume the practice a legitimate measure to protect the identities of local photographers, this is unlikely as the photographers' names are obviously fake, as is the case with "Yazan al-Homsi" (Yazan of Homs) and "Thaer al-Khalidiya" (Revolutionary of al-Khalidiya) whose photos Reuters distributes. These names are credited in the standardized fashion (Agency/photographer's name), without any indication that these pseudonyms are as generic as say, "Michael of Jersey City" or "Revolutionary of Brooklyn."

Critical audiences, particularly those already skeptical of western media narratives and the insufficient scrutiny with which material obtained from activists in Syria is handled, often presume that media (selectively) focus on or frame images of devastation. By corroborating and geolocating photos, clarifying authorship and elucidating verification processes, the media can assuage doubts about the veracity of images that offer rare testimonies to a besieged city's fate.

Postscript

A number of platforms are used to disseminate visual evidence from the Syrian conflict, but the vast majority of content is consequently embedded, linked to, and disseminated via a single platform: Facebook. The social network, largely associated in the West with the sharing of personal minutiae, currently houses the most comprehensive archive of material from Syria's two-and-a-half-year conflict.

Facebook's indexing of information is most often debated in the context of user privacy, in which searchability constitutes a key concern. But the platform's utility for the purpose of researching, newsgathering, and investigating events—particularly outside of real time monitoring—hardly figures into public discussion. Despite newer features such as Facebook's Timeline, which allows users to peruse page entries by select month, the sheer volume of posts means that retrospective inquiries must be undertaken by scrolling endlessly and manually through thousands of separate pages and groups.

Retracing the origin of an image published without adequate captioning or sourcing in the western press can hence require plotting a reverse trajectory from the far-flung to the local, via various intermediaries: a western newspaper may attribute an image to a western news agency, which in turn attributes the photo to a Syrian news aggregator site such as SNN that reposts content from across Syria. If the aggregator itself provides no information about the origin of an image, one is left to peruse the individual social media pages of associations by date. There are dozens, if not hundreds, of different pages and groups for each locale. These pages, in turn, represent overlapping geographical entities, with organizational names indicating coverage of a province, city, municipality, or neighborhood. It is unclear whether content is being uploaded locally or by external activists, or in some cases by associations displaced by fighting, as was the case with the local coordination committee for Qusayr after opposition fighters were routed from the town by regime forces in June 2013.

There are estimated to be over 1,200 armed groups each operating their own media apparatus. The mercurial nature of the conflict means that brigades coalesce, split up, and are renamed all the time, and often include semi-autonomous local chapters. Finally, there are individual reporters and "citizen-journalists," many of whom operate under pseudonyms and from outside the country. Content is cross-posted by all of these sources on Facebook.

When in March 2011 Syrians set out to document what was happening on Facebook—a platform to which they had only recently gained access—no one could have anticipated the protracted duration and scale of the conflict. With no end yet in sight to the war, the record of events appears irredeemably tied to a platform that essentially buries ever greater quantities of information and evidence.

An extended version of this essay was originally published online on Dische-Becker and Ashkar's blog, "Exit Left," August 23, 2013, http://exitleftproject.wordpress.com/2013/08/23/panorama-of-destruction-the-story-behind-the-aerial-view-of-homs.

1 Maria E. Vetrocq, "Rules of Engagement," *Art in America* (June/July 2008): 168–209, at 169.

2 Adding to the decline in media coverage were the much publicized deaths of *Sunday Times* reporter Mary Colvin and French photographer Remi Ochlik, which further discouraged reporters from entering Homs.

3 This number was reached by comparing the approximate location (i.e. the bottom left hand corner of the aerial shot) to Google Earth imaging. Due to the angle of the camera and the fisheye lens effect, the altitude might in fact be lower, closer to 100 meters.

4 AFP is an acronym for Agence-France Presse.

5 Bab al-Sbaa is a neighborhood south of the center of Homs; al-Khalidiya is located to the north of the center of the city.

6 See Assia Boundaoui, "Syrian-American Activists and the Sham News Network," PRI's The World, November 18, 2011, http://www.theworld.org/2011/11/syria-american-activists/.

7 See Matt Blake, "The wasteland: Horrifying aerial pictures show full scale of destruction of Syrian city of Homs," *Mail Online*, July 29, 2013, http://www.dailymail.co.uk/news/article-2380913/Syria-Homs-aerial-pictures-scale-destruction.html; "Syrie : L'armée contrôle une large partie de Homs," *Libération*, July 29, 2013, http://www.liberation.fr/monde/2013/07/29/syrie-l-armee-controle-une-large-partie-de-homs_921612; "Apocalyptic images reveal the shocking scale of devastation in Syria," *Independent*, http://www.independent.co.uk/news/world/middle-east/apocalyptic-images-reveal-the-shocking-scale-of-devastation-in-syria-8738135.html?action=gallery&ino=1, last accessed October 2013; "Aeriel view shows the destruction in the Khalidiya district of Homs," NBC News, http://www.nbcnews.com/id/43855448/ns/default?q=Homs, last accessed October 2013.

8 http://www.imageforum-diffusion.afp.com/, document NIC6236090, last accessed October 2013.

9 See http://youtu.be/x06Q18bOH90, at 06:10, last accessed October 2013.

10 "Battle of the neighborhood of Wadi al-Sayeh, the fate of Homs" (trans.; original in Arabic), *an-Nahar*, June 12, 2013, http://www.annahar.com/article/39909.

11 See http://youtu.be/n900nPgcI40, last accessed October 2013.

12 See http://youtu.be/iHmGDhIWHxc, last accessed October 2013.

13 See https://www.facebook.com/katebetalekhlas1/posts/229845450494019, last accessed October 2013.

14 The starting cost for the drone—which can reach an altitude of 800 meters and remain airborne for 10 to 12 minutes—is $390, without the camera and transmission equipment.

15 See David Campbell, "Thinking Images v. 15: Syria, social media and photojournalism," April 26, 2011, http://www.david-campbell.org/2011/04/26/thinking-images-v-15-syria-social-media-photojournalism/#sthash.B7RDNhFt.dpuf.

ECOLOGIES



The Forensic Scenography

Anselm Franke

Planet Earth as Forensic Object

This is a project tracing a number of shifts, reframing aesthetics, law, material objects, and historical narrative, from subjects to objects and back. From a curatorial perspective, we shall begin with the largest shift, because it concerns a "frame" that conditions the others and puts them into perspective. It is planetary in scale, and best demonstrated by calling upon an image: the photograph of Earth as seen from space. When this image was first seen in 1968 as the "Earthrise" photograph, it was met with amazement: its evocation of the fragility of the planet, its beauty and wholeness, charged it with the power to effect a new recognition of what life meant on Earth. It was an image of a timeless planetary condition, seemingly beyond history, binding humanity and nature together. And it signified that this planetary condition was endangered: thus it became an icon of the environmental movement. It was also a call for "the world" to "come together": while the nuclear mushroom cloud stood above the rise of a new international order and the binary confrontation of the Cold War, the icon of the Blue Planet acted symbolically as the frame of an era of globalization, identity politics, of a politics of the humanitarian, and of the breaking-down of boundaries on the path to neoliberal integration or, so it was hoped, to a new ecological consensus. This hopeful expectation opened up a series of different possible readings of the photo of Earth. By using the picture as a mobilizing icon calling for global political change, the environmental movement had in effect called upon a global forum: the forum where humanity was to confront the planet.

Through this very invocation of a global forum, planet Earth itself had turned in its entirety into a forensic object. This is true simply because it invokes a forum: a global public, however much this forum remained a projection. Like every forum, this one was concerned with finding "common ground," with the crafting of political or scientific judgment or consent across and through different registers of language and disciplines, chiefly science and the law. The forum is about the attribution of causes, about liability, methods of identification, and corresponding frames of recognition. It is thus the paradigmatic site of translation, mediation, and figuration, and similarly the site where all such mediation is put to the test. And does the photograph of Earth not also represent the becoming-global of a new media condition that would



Fig. 1. Beyond War, *No Frames. No Boundaries,* 1984. Film still. Courtesy of Beyond War.

envelop us as techno-social environment, and as paradigm of permanent visibility in a new planetary real-time? The contemporary shift towards the forensic takes place against the backdrop of the shift to a new epochal icon. The forum called into being by this new icon is no longer simply that of "international politics" or "competing ideologies": it is a site enabling the mixing of politics with nature, technology, ideology, and culture. The planet: a monstrous forensic object in the unstable forum of a global public and global visibility regime.

Beyond the sublime impression of planetary beauty, the photograph of Earth—now understood as forensic object—becomes an image of violence. This violence is not visible as such, it must be forensically recovered from beneath the veil of sublime beauty. The environmental movement speaks of the violence of industrialized modernity against nature and of the exploitation of the planet. But the "environment," in a time of chemical warfare and manmade natural catastrophes, has long since also become a means of violence and, as Nabil Ahmed has shown, the iconic Blue Marble photograph made from Apollo 17 in 1972 is itself a monument to the entanglement of political and natural violence: overlooked by millions, it features a cyclone hitting the coast of the Bay of Bengal.[1] Two years earlier, in the very same place, the Bhola cyclone had sparked political violence, ultimately leading to genocide and the secession of Bangladesh from Pakistan.

In 1974, astronaut Russel Schweickart had put his experience of seeing the Earth from space into words:

> You look down there and you can't imagine how many borders and boundaries you crossed again and again and again. And you don't even see 'em. At that wake-up scene—the MIDEAST—you know there are hundreds of people killing each other over some imaginary line that you can't see. From where you see it, the thing is a whole, and it's so beautiful. […] And you realize that on that small spot, that little blue and white thing is everything that means anything to you. All of history and music and poetry and art and war and death and birth and love, tears, joy, games, all of it is on that little spot out there that you can cover with your thumb. […] Now you're no longer inside something with a window looking out at a picture, but now you're out there and what you've got around your head is a goldfish bowl and there are no limits here. There are no frames, there are no boundaries. […] You know very well at that moment, and it comes through to you so powerfully, that you're the sensing element for man.[2]

What Schweickart was not aware of was that he himself, and his camera, had now come to embody the very boundary that he was unable to see below on Earth. Space travel had extended the American frontier (the paradigmatic modern-colonial frontier) vertically into space. The photograph of Earth did not lead to the radical change of consciousness environmentalists had desired, or to a new "family of man" to follow the end of colonialism for a world on the road to peace and cooperation. Rather, the photograph manifests a continuation of the colonial and genocidal frontier of modernity. In question is not merely the frontier of technological development, but that of conquest and empire, and of a modern ontology at war. The image of Earth is representation in the service of the frontier, part of the violence of representation and an identitarian regime that was crucial to its progression. What is important is not only what is or is not visible in the image, but also its circumstances of production: thus brought up into the orbit, the frontier had turned into a universal condition, a global environment. The conquest of wildness, the mythical encounter with imaginary, and simultaneously *produced*, un-order, has been replaced by operations that merely secure global order; or, as political researchers have asserted, wars have become policing actions within an imperial interior, indistinguishable from whatever else we may still call "the environment." Russel Schweickart, who had felt that he had been a "sensing element for man" out in orbit, has been replaced today by uncounted technological sensors, which monitor the "thick surface" of the planetary interior.

But the photograph of Earth, as a historical icon, does not merely stand for the transformation of the frontier into a border-environment, for turning the gaze from expansion to intensification, exchanging out- and inside. It also stands for the collapse of figures and grounds on a planetary scale: above all, the figure of "humanity" against the planetary backdrop of "nature," the driving engine of History with a capital *H.* The epistemological and

disciplinary distinctions of modernity, particularly of the Cartesian heritage, reveal themselves to be dialectical, multi-stable figures: figures in which one or more aspects can be seen, and the relation between "figure" and "ground" can be reversed, each aspect depending on the other. Every forensic act is an act of "figuration," tracing a lost figure within an already almost undifferentiated ground as in the process of exhumation, or of folding figure into ground by reversing the nexus of agency, the active (agent) with the passive (patient); for instance, between a human actor and a natural force.

The Making of Speaking Objects

I want to begin this curatorial discussion of the "forensic scene" with a painting. It shows a scene that shifted ontological grounds: the making and the representation of a scientific object, the vacuum. The painting depicts a demonstration by a scientist: a white bird, a cockatoo, fluttering in panic as the air is slowly withdrawn from the vessel by the pump. The dying of the bird demonstrates that there is no life possible in the vacuum. The feathers are also not moved by the wind of the ether, whose existence Robert Boyle (1627–1691) thus disproved, and it was after Boyle that the experiment shown here was modeled. Donna Haraway has called Robert Boyle "the father of chemistry and, even more important, father of the experimental way of life."[3]



Fig. 2. Joseph Wright of Derby, *An Experiment on a Bird in the Air Pump*, 1768. Oil on canvas, 183 x 244 cm. © The National Gallery, London.

This a scene of reduction and isolation: the life-supporting atmosphere is being withdrawn from a glass sphere, the bird is being isolated from the milieu. The vacuum thus "speaks" of itself, by itself, but its language is mediated by the death of the bird. But the (invisible) vacuum in this painting is also a metaphor for the "milieu" of the scientific fact, built on the stable ground of inanimate, inert, and isolatable matter. The scene of the painting firmly aligns scientific objectivity with death.

Furthermore, the painting shows a forum, demonstrating that modern science cannot be separated from forensics. The scientific fact comes into being through demonstration and mediation. In the painting, there is the scientist who gazes out of the picture as if to address the onlooker. There are two gentlemen, one partaking in the experiment by timing it, the other present as a witness. One girl is turning away from the sight while another gazes worriedly at the bird; both are in the arms of their comforting father, who we may imagine is attempting to explain to them the meaning and sense of the procedure. It is a gendered scene: men predominantly display rationality, women show emotion. The girl may perhaps remind us uncannily of Hillary Clinton's globally discussed gesture of affect in the famous photograph of Osama bin Laden's killing. For the women and the men in the picture, different aspects of what is happening stand in the foreground: the terror of painful death, or the truth of a scientific fact, depending on one's viewpoint. There is even the possibility of disinterest in both the demonstration of the invisible vacuum and the death of the bird, as signified by the two lovers on the left side of the picture. It is perhaps not insignificant that the painter made the dying bird white, thus associating it with the traditional iconographic representation of the Holy Spirit. But the specific kind of bird is also important: as a cockatoo, it belongs to the family of parrots. And the parrot is a symbol of mimesis, the kind of mimesis banned from the republic: mere copy, no essence, no idea. This is mimesis as in the jungle, as in nature, but also as in the delirious game nature plays through resemblances with the human mind. The parrot and the jungle: these are for the modern imagination symbols of the media-condition of the other, a condition in which signs and things are inextricably and deliriously entwined—the forest of projections of "the primitive." What is symbolically put to death in this painting are two media-conditions, two forms of mimesis, one Christian and the other pagan or primitive. In England in the seventeenth century, the cockatoo, a bird from Southeast Asia, was indeed rare and not likely to be used in a scientific experiment of this kind: the painting hence also allegorizes the making of empire, the colonial laboratory.

A scene of the making of a double-faced "figure" on new ontological grounds: the making of the object (dead bird and vacuum) is at the same time the making of subjects and of a society—a society now grounded in the authority of scientific objectivity, and no longer with an appeal to transcendence. The Holy Spirit, the divine origin and all-embracing medium, is dead. The chains of mediality are being reconfigured: this is why we are looking

at a scene of cosmological and ontological reengineering. The dead bird testifies to the fact of the vacuum, but this testimony of nonhuman things must be witnessed, read, and translated, and this gives rise to the figure of the proper witness, a witness with a specific, non-female "modesty." Donna Haraway sees in the emergence of this figure and the respective "social and literary technologies" a "founding gesture of what we call modernity," effecting a separation between expert knowledge and mere opinion. Haraway specifies the virtue of this witness:

> This is the virtue that guarantees that the modest witness is the legitimate and authorized ventriloquist for the object world, adding nothing from his mere opinions, from his biasing embodiment. And so he is endowed with the remarkable power to establish the facts. He bears witness: he is objective; he guarantees the clarity and purity of objects. His subjectivity is his objectivity. His narratives have a magical power—they lose all trace of their history as stories, as products of partisan projects, as contestable representations, or as constructed documents in their potent capacity to define the facts. The narratives become clear mirrors, fully magical mirrors, without once appealing to the transcendental or the magical.[4]

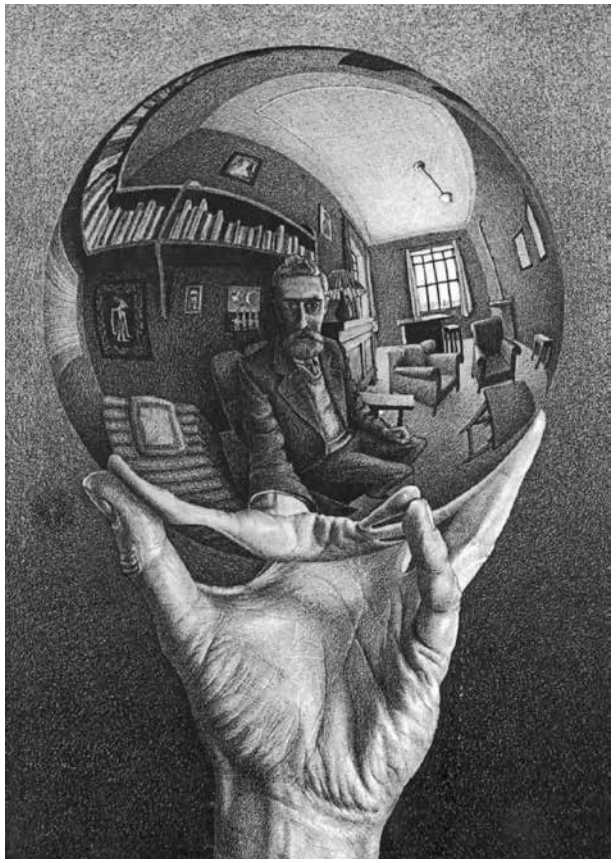


Fig. 3. M. C. Escher, *Hand with Reflecting Sphere*, 1935. Lithograph print.

The Eclipse of Mediation

This quasi-magical "eclipse" of the process of mediation, here coupled effectively with the vacuum, through the modest witness's equation of objectivity with a specific form of subjectivity, has been the focus of much discussion and bewilderment: it is the origin of a new form of power. But it works only as long as the equation works, as long as the short circuit between the two sides of the equation can be performed, and performed it must be. The new subject created here exists, so to say, by virtue of the vacuum. Its paradigm is the absence of the relational milieu for which the vacuum stands, the reduction of mediation: in the vacuum, there is pure ontological, inanimate thingness. The subject undergoes a transformation that cuts much of itself apart from the new principle of reality: the "merely" subjective becomes a shorthand for opinion, for illusions, for fancy, imaginations, and fantasy, and these characteristics and faculties are being feminized and pathologized. The bigger part of the subject having thus been fictionalized in ontological terms, the remainder becomes modern rationality's "objective consciousness."

But the fictional part is also liberated as autonomous individual: its reality emerges as self-image. A drawing by the infamous graphic artist M. C. Escher shows this "apparition" of the self-animating, self-authoring, autonomous modern subject as counterpart to the new reality principle crafted on the ontology of the vacuum, of the de-animate thing. The flask of the vacuum pump is here replaced by a sphere made from glass, reminiscent of the crystal balls through which the magician gazed. But there are two possible kinds readings of the "magic" in Escher's drawing: on the one hand, it is the self-authoring of the rational, male subject and thus a picture of the unstable magic of the identity principle. On the other hand, it is also an image of the standard Enlightenment critique to which Boyle's flask answers: without the modest witness ventroliquizing the "purified" facts of nature, all we ever really see is our own reflection.



Fig. 4. Anonymous (geographical origin: Addis Ababa, Ethiopia), *Assembly of the Animals,* 1965–1975. Oil on linen. Courtesy Tropenmuseum, Amsterdam. Object no. 5956-5.

The Social Bond

There is a third image that mirrors and contrasts the depictions of these scenes, and it also shows a forum. It is a painting by an Ethiopian artist probably dating from 1972, which is found in the collection of the Tropenmuseum in Amsterdam. Neither the painter nor the title of the piece are known to the museum, but the collection files it as *Assembly of the Animals*. It is a painting whose iconography is firmly situated within the centuries-old tradition of the Ethiopian orthodox church. The picture is divided into a larger upper and a smaller lower section by a thick line. Above the line is a round table around which a group of animals congregate, chaired by a lion. And above the lion, emitting rays of light, there is the symbol of the Holy Spirit, the white dove. Inside the round table, there is an old ape standing upright, reading and possibly reciting from the scriptures.

This image can be understood as depicting a primal scene, the founding

and creation of society, of the institution of man as the political animal. This round table, this circle, can act as a universal symbol for any social bond, for political representation, but also for the fact that a certain measure of agreement is indispensable to every community, the very condition for speaking a language in which each can simultaneously understand and misunderstand each other. In particular, the image depicted is a society whose unity is guaranteed by the Holy Spirit and its law, referring to the bond of Christian society, and perhaps to redemption and the last supper or day of judgment, too. But it also refers to a mythical past time before the Fall from the Garden of Eden. The Bible of the Ethiopian church includes the Book of Jubilees, also known as the Little Genesis, which is thought to have been composed between 175 and 140 BCE, and which is written in the Ethiopian language Ge'ez, the liturgical language of the Ethiopian Orthodox Church to this day. From the Book of Jubilees we learn that before the Fall, animals were able communicate with each other in a "common tongue." It was only when they were expelled from the Garden of Eden that the mouths of cattle and birds and of "everything that walks or moves, were shut." The image can thus also be understood as referring to a pre-Christian past, one that is frequently found in African mythologies, in which all beings, gods, humans, and animals participated equally in the creative process and communicated with each other.[5]

Elsewhere, I refer to this unbounded sociability in terms of "animism," and as potential ontological anarchy, a radical de-framing of social borders.[6] But there is a line in the painting, and this is the line of sociability itself, and hence of politics par excellence. This is the line of in- and exclusion, the threshold which must be crossed to gain access to representation, voice, and rights, to become a part of the circle of the social. The social ends in the barbarous, "wild" scene below: all there is, is flesh as prey—objects—and lawlessness or the natural laws of war. This line of course is what makes the picture interesting: it turns the painting into a border-machine, as a graph of theological time, the foundations of the state, and of what Giorgio Agamben discusses as the "anthropological machine."[7] It is also interpretable as a picture of the *internal* division of the human—the dichotomy between animality transcended, and animality that reigns.

But it is also a possible rendering of the Hobbesian Leviathan, of the "social contract" above versus the "state of nature" below, and of the modern division of civilization from savagery. But then which comes first? Did we rise above nature, or did we fall from a golden age into barbarity? Is "primitivism" civilized life purged of its vices, or stripped of its virtues resulting in a subhuman, animalistic existence? The question has far-reaching consequences: it is decisive for our relation to social order, and to the necessity of policing this order, for the issue of when to guard the line of sociability and when to challenge the order it represents as that which produces the very divisions onto which it projects its defensive agency.

It is interesting to note that this painting, beyond its religious connotations, can also be seen as an allegory of the North/South relationship: on the one hand, as a depiction of the way Europeans represented Africa since the Enlightenment (a European civilization that has risen above the barbarity depicted below) but also, and more likely, as a depiction of how Africa experienced Europe. The painting's origin is Ethiopia, a country which, by the time it was painted, had experienced the barbarism of "civilization" in the form of Italian and fascist campaign at its worst. Finally, one more possible way of viewing the picture, perhaps the most associative interpretation, would be to regard the scene as the representation of an ecological crisis: ecology above, exploitation and looting below. The round-table assembly could be seen as a representation of the first UN summit on the environment in 1972, the same year the painting was most likely produced: a representation of the moment when nature, now in the form of "the environment," becomes a matter for a truly global forum, calling for a global social contract transcending the nature/culture divide and the corresponding line of sociability, including not only humans in the socius, but nonhuman nature as well.

The image can thus be turned around the axis of its internal division several times to reveal, in each of the results, the co-constitution of the two sections, the fact that the line of the scission emerges from within the same system, on the same ground, as above all a political line. Furthermore, the painting of the vacuum pump and the painting of the assembly can be interestingly juxtaposed: each depicts both "nature" and "society," "matter" and "spirit," yet with opposing constructs at their respective centers—in one the ontological designations "scientific object" or "thing," and in the other its opposite, the ontological designation "society."

Or in the words of Bruno Latour, who charges Boyle and Hobbes with having each developed one of the two branches making up modernity's dualistic constitution, the two of them are co-constitutive and yet mutually exclusive, leading modernity to "see double": "On the one hand, the subject of law; on the other, the object of science. The political spokespersons come to represent the quarrelsome and calculating multitude of citizens; the scientific spokespersons come to represent the mute and material multitude of objects."[8]

The Forum of the Exhibition as "Ontographic" Device

I have discussed these pictures at some length to provide historical background. To produce an exhibition on forensics we have to situate the popular understanding and aesthetics of forensics and the medium of the exhibition in relation to this background. The exhibition as a medium is closely related to the first picture, to the forum in which "things" speak: this painting shows the making of a scientific object that speaks the language of facts. But this is only one side of the medium, the side associated

with the museum and hence with the identification, classification, and preservation of objects, where positive, objective knowledge is firmly aligned with death, with fixation of movement and the forestalling of transformation over time. The other side of the exhibition is associated with art and hence with "aesthetic experience," which is (even if only in the securely isolated space differentiated from reality "out there") an unstable, ontological testing ground, where objects and subjects can mobilize each other in interesting and strange ways, engaging in a mutual figuration where their relations can thus be explored as dynamic and historically contingent. The medium of the exhibition, insofar as it embraced and was shaped historically by both the positive scientific or historical "fact" and the negativity of art and subjectivity of the viewer, is situated between the ontological designations of modernity. It is a space and an optical device situated exclusively in the realm of mediation between clearly discerned "objects" and "subjects" as extreme cases of the possible breakdown in and of a dialogic situation of mediation. In the medium of the exhibition, everything that was ruled out in modern times and in the division of knowledge and labor was thus allowed to be preserved: dinosaurs, mimesis, the unity of experience, even animism. The "speech" of objects was no longer limited to their positive signification in a determined narrative: it was possible to focus on the unruly sign-power as such, whether originating from subject or object. The price for this exceptional status, allowing representation to be mobilized ontologically, was political inconsequentiality. The exhibition, as long as art is involved, is a quasi-fictional space, a mere rehearsal. And as long as science and scientific facts are involved, it has to be detached from immediate practice and use, too: the labor and messiness of science has to disappear. But the exhibition is also a forum of a particular kind, uniquely suited, because of this double character, to question the very constitution of forums in general.

The medium of the exhibition is a possible "ontographic" device: a means to trace shifting relations between, or the reciprocal production of, subjects and objects, forms of subjectivity and objectivity, processes of subjection and subjectivation, and processes of objection and objectification. The exhibition, because of its institutional history, is the privileged medium for turning the double vision of dualist modernity into a stereoscopic view on history, not as linear progress, but as the crafting of boundary-making practices and the forms of mediality they yield and authorize. The processes within and across borders are the matter of aesthetics proper. And aesthetic processes, universally and by definition, partake, and are constitutive, of the border of the social. Aesthetics is what defines the milieu, the atmosphere, the unspoken consensus of sensation. The impressions induced by violations of the border of the social are those that we are most familiar with: fear, the uncanny, horror, enchantment, also laughter. Indeed, laughter is an example illustrating the degree to which this border or limit operates implicitly in the everyday, as part of all cognition and, quite literally, as integral to the processes by which we make sense of the world. Imagine a joke in the human animals' assembly in the painting above: humor, or an unintended joke, is like a breach in the circle, an intrusion of non-sense into sense, and the reaction is to close the circle; the bodily affect of laughter works to this end. The painting then would be no longer about the constitution of the social body at large, but about the immanent, social constitution of the body itself.

The Symptom of Forensic Aesthetics

Forensic aesthetics are the contemporary boundary-aesthetics par excellence. The popular mass-media aesthetics of the forensic demonstrate this: the forensic here is always a response to the breaching of limits and of violence towards order, a response acted out, in the overwhelming majority of the cases, by the organs of the state and in the name of its order. The aesthetics of forensics testifies to the panic at the heart of this order: its very effects, its atmospheric constitution, are animated by this panic, its gestural language a symptomatic product of the immune-reaction to an ontological threat. Acts of violence tear a hole in the social fabric and the grid of order alike, opening up a gap between signs and things, persons and material objects, bodies and identities, life and death; and in this gap, the order as such is at stake, like a map that has been detached from its physical referents. To live in a forensic present means to live under the paradigm of the clinic and its regime of hygiene. The forensic response as we know it from popular television series is about the closing of that gap, about the ways of assessing, calculating, and restoring those same boundaries. In this manifestation, the forensic aesthetic of the present is a governmental tool within a biopolitical regime of identification, a symptom of the administration of precarious and endangered life—of untraced movement across the lines.

The modern history of the forensic, as Eyal Weizman points out in his introduction to this volume, is "the history of the techniques by which states police individuals. It includes the physiognomic techniques of the nineteenth century and the digital eavesdropping of today." It is important to picture the extent to which the technological basis of forensics is based on technologies of identification and fixation, and the degree to which these very same technologies are the basis of mass entertainment, as exemplified by the development of games both for military and consumer purposes. The imperial map and order today have together become a technologically equipped sensorium, an environment in which map matching is gradually extended into every aspect of life, and the surveillance of life can turn at any point into the inscription of death. This is a map that modulates flows and movements, and registers deviance from patterns: the map-as-environment as enriched and dynamically adjusted as we move within its space—a space that is no longer divided by in- and outside, but by the production of life and death, by inclusion or abandonment.

On the other hand, there is a forensic momentum that refers to a restless modern past that is currently being exhumed, unburied, and investigated, at a time when not just the nature of violence, but also the means of holding perpetrators accountable, are dramatically changing. The forensic here can serve the identitarian agenda of states or certain minorities, but it can also be essentially turned against state and symbolic power. The countless restitution claims concerning not only artifacts, but also human remains, which museums and other institutions are currently facing from victims of violence and formerly colonized people, further testify to the scope of forensic aesthetics as a mode not only of restoration of histories/continuities otherwise lost, but of their active construction. Forensic identification serves to establish "truth" as a means of the reconstruction of social bonds that have been destroyed, of different possible societies, a task which is most often related in this context to the identification of human remains. A map of exhumations of sites of political violence would show that we can truly speak of a global momentum, which points to a universal dimension of political violence in modernity and in the name of the state — a "negative" universality, to be sure, but one whose explication provides a possible "common ground," a basis on which we can imagine what is missing from actual universality.

1 See Nabil Ahmed, "Entangled Earth," *Third Text*, vol. 27, no. 1 (January 2013): 44–53; and *Radical Meteorology* (2013), three-channel video (3'46", 4'12", 5'53") and two-channel audio.
2 Russell Schweickart, "Whose Earth?," 1974. Transcription available at http://settlement.arc.nasa.gov/CoEvolutionBook/SPACE.HTML, accessed November 2013.
3 See Steven Shapin and Simon Schaffer, *Leviathan and the Air-Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, NJ: Princeton University Press, 1985).
4 Donna J. Haraway, *Modest_Witness@Second_Millennium. FemaleMan©_Meets_OncoMouse™: Feminism and Technoscience* (New York: Routledge, 1997), 24.
5 See Shelagh Ranger, "Animals in African Legend and Ethiopian Scriptures," in *The Encyclopedia of Religion and Nature*, ed. Bron Taylor (London: Continuum, 2006).
6 See Anselm Franke, ed., *Animism*, vol. 1 (Berlin: Sternberg Press, 2010).
7 Giorgio Agamben, *The Open: Man and Animal* (Stanford, CA: Stanford University Press, 2004).
8 Bruno Latour, *We Have Never Been Modern*, trans. Catherine Porter (Cambridge, MA: Harvard University Press, 1993), 29.

Floating Bodies

Adrian Lahoud

Weaponizing Earth

> Our peacetime economic relations, working slowly and continuously, produce the same results as would a short global conflict, as if war no longer belonged to soldiers alone now that it is prepared and waged with devices as scientific as those used by civilians in research and industry. Through a kind of threshold effect, the growth of our means makes all ends equal.
> —Michel Serres[1]

On July 14, 2008, an arrest warrant is issued from The Hague by the Chief Prosecutor of the International Criminal Court (ICC) Luis Moreno Ocampo alleging that Sudanese President Omar al-Bashir systematically attempted to eradicate the Fur, Zaghawa, and Masalit people of Darfur. The charges in the warrant include war crimes, crimes against humanity, and genocide.

Some eighteen months later in a convention center in Copenhagen, the Sudanese diplomat Lumumba Di-Aping, representing the G77 Group of Developing Nations, calls an impromptu press conference during the 2009 Climate Conference. Di-Aping will return the accusation of genocide back to the industrialized nations of the world: he will accuse them of systematically thwarting negotiation on climate change, failing to prevent a catastrophic temperature increase, and, therefore, condemning millions in Africa to certain death. Di-Aping is immediately described as a hysteric by sections of the press.

Between Ocampo and Di-Aping the contours of two different concepts of violence come into view. The first addresses the past in order to deliver justice in the present. The second addresses the present in order to avert a future harm. The alleged genocide in the first instance is familiar, involving militias and their sponsors, a sequence of brutal massacres. The alleged genocide in the second is little understood and involves a set of unlikely agents: atmospheric patterns, ocean temperatures, indigenous groups, and climate scientists.

Whether it is ritualized through acts meant to subsume the individual within a group, or industrialized within the apparatus of modern warfare, it is impossible to think violence without an act which sets into play the very tools of violence. When it occurs, violence takes a punctual form—a solitary projectile moving through space, a cloud of shrapnel blooming in a crowded room. In turn, this occurrence organizes a space according

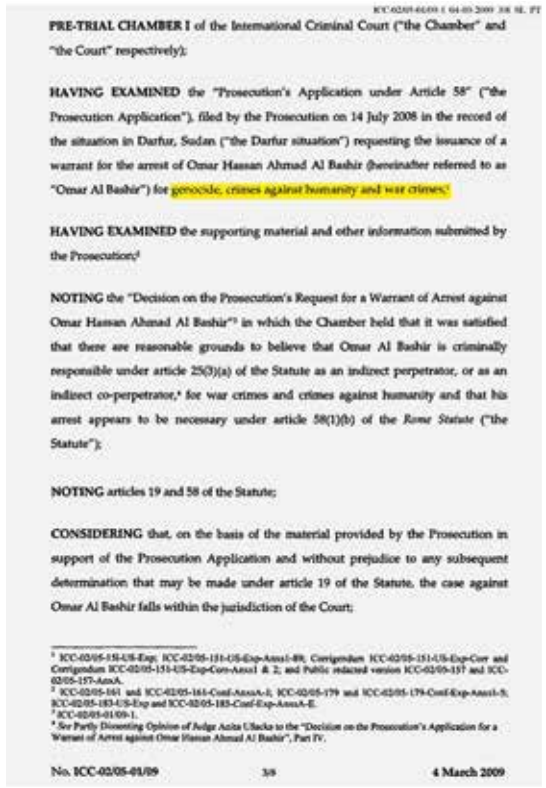
to the trajectories of confrontation between the aggressor and their victim within a limit *circumscribed* by the possible extension through space of the combatants and their weapons.

Nor is violence endless; its occurrence occupies a moment within time, finding its origin in the pressure applied to a trigger only to be extinguished with the life this pressure means to end. In its continual potential for escalation—even in our wartime invocations of peace—violence abides by all of this. It involves a weapon whose possible action and consequence is limited within the space-time of a violent event. The various ethical and moral norms which regulate and distinguish between the acceptable and unacceptable forms of violence arise from human experiences of violence: experiences whose character offends moral norms and solicits collective response in the form of laws that must be enforced, procedures that must distinguish between claimants in order to produce verdicts from which either recompense or punishment can flow.

This is the violence and law we know. Is it possible, however, to imagine another kind of violence? Can we imagine a crime without a criminal? A violence without coordinates on which transgressions might be plotted? A violence with no "x" and with no "y"? A violence with no weapon and no witness, passing invisibly through the human sensorium—leaving no memory, no testimony, and no record? That is to say, can we imagine violence without a violent event?

By what right would this impossibility warrant the word "violence," let alone the term "crime"? If this early proposition is still too unformed, can we instead conceive of a world become weaponized? A world in which the very facts of everyday life, the basic habits and simple routines, by the sheer cumulative weight of their repetition, begin to consume, overwhelm, and finally destroy their host. Our sum, which now totals seven billion, does not only grow, it changes phase, bringing forth a different problem and a new internal topology, presenting a violence without limit and end—a violence that we are yet to recognize.

The hypothesis here is that structural violence is criminal. If this is true, then the genesis of structure is a criminal event, the space of genesis its crime scene. This essay attempts to describe this violence to come, the signs of which have been with us since the start of our industrial society. It proposes that the conflict over global carbon capacity is in very real terms a war, but a war whose agents, weapons, and theater of operations bear little resemblance to the conflicts of the past.



ICC-02/05-01/09-1 04-03-2009 3/8 SL PT

PRE-TRIAL CHAMBER I of the International Criminal Court ("the Chamber" and "the Court" respectively);

HAVING EXAMINED the "Prosecution's Application under Article 58" ("the Prosecution Application"), filed by the Prosecution on 14 July 2008 in the record of the situation in Darfur, Sudan ("the Darfur situation") requesting the issuance of a warrant for the arrest of Omar Hassan Ahmad Al Bashir (hereinafter referred to as "Omar Al Bashir") for genocide, crimes against humanity and war crimes;[1]

HAVING EXAMINED the supporting material and other information submitted by the Prosecution;[2]

NOTING the "Decision on the Prosecution's Request for a Warrant of Arrest against Omar Hassan Ahmad Al Bashir"[3] in which the Chamber held that it was satisfied that there are reasonable grounds to believe that Omar Al Bashir is criminally responsible under article 25(3)(a) of the Statute as an indirect perpetrator, or as an indirect co-perpetrator,[4] for war crimes and crimes against humanity and that his arrest appears to be necessary under article 58(1)(b) of the *Rome Statute* ("the Statute");

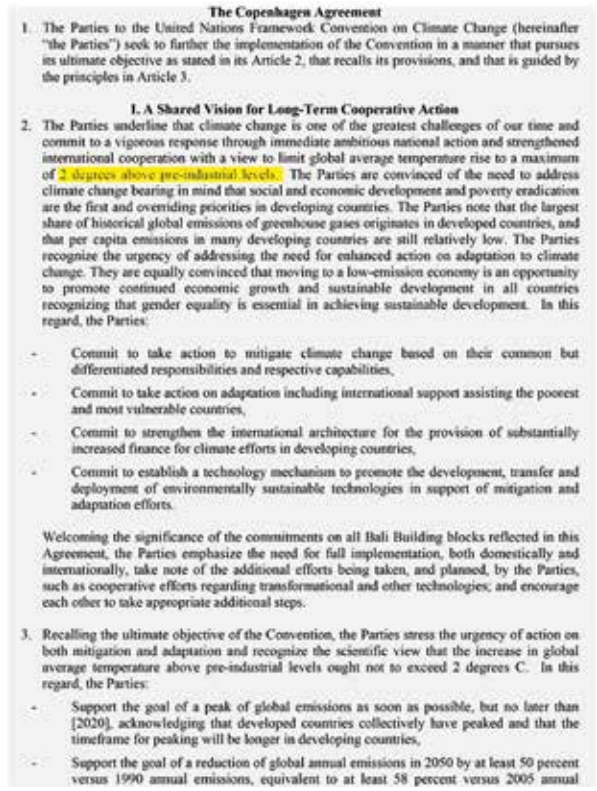
NOTING articles 19 and 58 of the Statute;

CONSIDERING that, on the basis of the material provided by the Prosecution in support of the Prosecution Application and without prejudice to any subsequent determination that may be made under article 19 of the Statute, the case against Omar Al Bashir falls within the jurisdiction of the Court;

[1] ICC-02/05-151-US-Exp; ICC-02/05-151-US-Exp-Anxs1-89; Corrigendum ICC-02/05-151-US-Exp-Corr and Corrigendum ICC-02/05-151-US-Exp-Corr-Anxs1 & 2; and Public redacted version ICC-02/05-157 and ICC-02/05-157-AnxA.
[2] ICC-02/05-161 and ICC-02/05-161-Conf-Anxs A-I; ICC-02/05-179 and ICC-02/05-179-Conf-Exp-Anxs1-5; ICC-02/05-183-US-Exp and ICC-02/05-185-Conf-Exp-AnxsA-E.
[3] ICC-02/05-01/09-1.
[4] *See* Partly Dissenting Opinion of Judge Anita Ušacka to the "Decision on the Prosecution's Application for a Warrant of Arrest against Omar Hassan Ahmad Al Bashir", Part IV.

No. ICC-02/05-01/09 3/8 4 March 2009

Fig. 1. International Criminal Court, Warrant for the Arrest of Omar al-Bashir issued March 4, 2009. Source: http://www.icc-cpi.int/iccdocs/doc/doc639078.pdf.



The Copenhagen Agreement

1. The Parties to the United Nations Framework Convention on Climate Change (hereinafter "the Parties") seek to further the implementation of the Convention in a manner that pursues its ultimate objective as stated in its Article 2, that recalls its provisions, and that is guided by the principles in Article 3.

1. A Shared Vision for Long-Term Cooperative Action

2. The Parties underline that climate change is one of the greatest challenges of our time and commit to a vigorous response through immediate ambitious national action and strengthened international cooperation with a view to limit global average temperature rise to a maximum of 2 degrees above pre-industrial levels. The Parties are convinced of the need to address climate change bearing in mind that social and economic development and poverty eradication are the first and overriding priorities in developing countries. The Parties note that the largest share of historical global emissions of greenhouse gases originates in developed countries, and that per capita emissions in many developing countries are still relatively low. The Parties recognize the urgency of addressing the need for enhanced action on adaptation to climate change. They are equally convinced that moving to a low-emission economy is an opportunity to promote continued economic growth and sustainable development in all countries recognizing that gender equality is essential in achieving sustainable development. In this regard, the Parties:

- Commit to take action to mitigate climate change based on their common but differentiated responsibilities and respective capabilities,
- Commit to take action on adaptation including international support assisting the poorest and most vulnerable countries,
- Commit to strengthen the international architecture for the provision of substantially increased finance for climate efforts in developing countries,
- Commit to establish a technology mechanism to promote the development, transfer and deployment of environmentally sustainable technologies in support of mitigation and adaptation efforts.

Welcoming the significance of the commitments on all Bali Building blocks reflected in this Agreement, the Parties emphasize the need for full implementation, both domestically and internationally, take note of the additional efforts being taken, and planned, by the Parties, such as cooperative efforts regarding transformational and other technologies; and encourage each other to take appropriate additional steps.

3. Recalling the ultimate objective of the Convention, the Parties stress the urgency of action on both mitigation and adaptation and recognize the scientific view that the increase in global average temperature above pre-industrial levels ought not to exceed 2 degrees C. In this regard, the Parties:

- Support the goal of a peak of global emissions as soon as possible, but no later than [2020], acknowledging that developed countries collectively have peaked and that the timeframe for peaking will be longer in developing countries,
- Support the goal of a reduction of global annual emissions in 2050 by at least 50 percent versus 1990 annual emissions, equivalent to at least 58 percent versus 2005 annual

Fig. 2. Draft of the so-called "Danish Text" from the 2009 United Nations Climate Change Conference in Copenhagen. Source: http://www.theguardian.com/environment/2009/dec/08/copenhagen-climate-change.

Every new weapon goes on to produce a new geopolitical relation. Nuclear weapons gave us bipolar cold war politics, "deterrence," "balance of power," and "mutually assured destruction"; similarly, "the war against terror" leaves us with "security," "targeted assassination," "nonstate actors," and a burgeoning theoretical literature on urban warfare and its asymmetries. In turn, the conflict over carbon now calls for its own sets of terms and concepts, ones able to capture the diffuse, unfamiliar causality of violence that this conflict marks.

Beginning with the production of energy from fossil fuels, in what follows a series of episodes that connect human industrialization to tropical weather systems, food production, and human movement will be set out in order to begin the project of depicting this violence to come. In turn, each episode is brought into existence through a specific event with a specific scale. The concept of "scale" must be given a new sense here if we are to think our way beyond the monotheistic reductionism of the common, the complex, or the universal.[2] Scale is defined in terms of an ontological, epistemic, and discursive genesis in which a *problématique* produces a bounded set of relations.[3] With regard to the problem of climate, we will see that the concept of scale forces a Faustian reinscription of the political within the very heart of reason itself.

Floating Bodies

> The clinamen manifests neither contingency nor indetermination […]. It manifests something entirely different, that is the irreducible plurality of causes…
> — Gilles Deleuze[4]

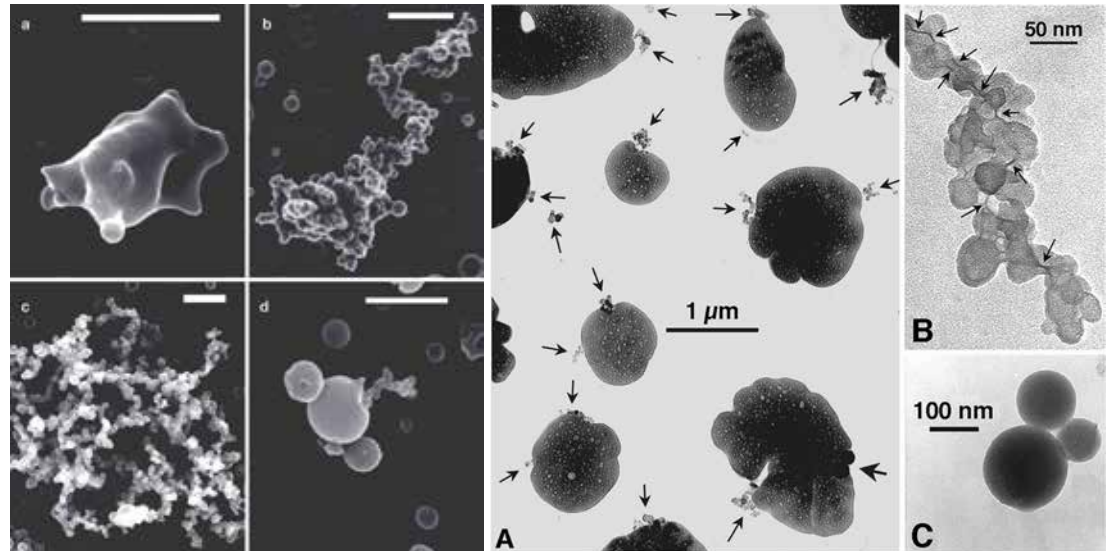
In order to liberate the potential energy fossilized in aromatic hydrocarbons such as oil, coal and gas, the compressed remains of organic compounds must undergo combustion, transforming dead photosynthetic material into heat. The advent of machines able to reliably convert these resources into energy has driven a radical intensification of human activity.

It has also given rise to two byproducts, the best known of which is a molecule called carbon dioxide. A less familiar side effect in this conversion process is the production of a diverse range of particles called aerosols.[5]



Fig. 3. GEOS-5 aerosol transport simulation by William Putnam and Horace Mitchell. Aerosols are small atmospheric particles that can be produced by various means, such as dust or sand being blown into the sky above a desert, by volcanic eruptions, or by burning fossil fuels. Aerosols have become an important heuristic device for understanding atmospheric air patterns since they carry a signature of their origin, allowing climate models projecting aerosol dispersion to be calibrated against observations and therefore improving their accuracy. The image on the left is a close-up taken from a global simulation of aerosol dispersion run between April 2006 and April 2007 showing dust marked red, sea salt marked blue, sulphate marked white and black, and organic carbon green. It clearly demonstrates the intensity of aerosol production from the industrialized northern hemisphere as well as the winds that carry these particles southeast. Image source: NASA/Goddard Space Flight Center.

Not all aerosols are human in provenance: besides particles with an anthropogenic origin like sulfates and black carbon, the total aerosol budget for the planet includes dust and salt particles lifted off the surface of the earth and oceans by wind. The unique character of aerosol dispersion has been noted for some time, as in observations of the measurable temperature decrease that can occur downwind of industrial areas when the amount of solar energy reaching the surface is "dimmed."[6] A dramatic natural equivalent occurred in 1816, known as the "year without a summer," when a veil of sulfates caused by volcanic eruptions shrouded the earth, tinting sunsets a dark reddish hue, inspiring J. M. W. Turner's iconic images of the skies above London painted that same year, and leading to devastating crop failure in much of Europe and North America.[7] The scientific recognition of this cataclysmic event, along with the Cold War fear that nuclear war would make for endless winters, prompted further attention to aerosol particles and their effects. Despite the renewed scrutiny, these floating bodies are only now beginning to reveal their impact on the world's climate. Researching aerosol patterns is like a fractal form of ballistics, a difficult science of trade winds, turbulence, and jet streams that only climatologists have learned to read. Their baroque scripts are kaleidoscopic, describing maps of oceanic and atmospheric transport, and an astonishing interlinking of human fortune that is as glorious as it is terrifying.



Unlike CO_2, the properties of aerosol particles depend on their size, shape, and atmospheric location.

Fig. 4. (left) Field-emission scanning electron microscope images of four different categories of soot particles. This image reveals the *morphological variation* of aerosol particles. Scale bars measure, 500 nm. Source: Swarup China et al., "Morphology and mixing state of individual freshly emitted wildfire carbonaceous particles," *Nature Communications*, vol. 4 (2013), article no. 2122.

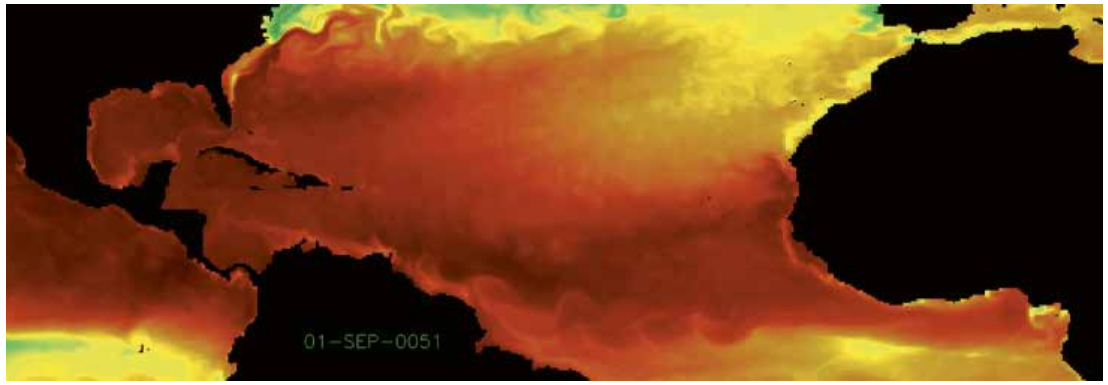
Fig. 5. (right) Image showing *scalar variation* in soot and sulphate aerosols. Source: Mihály Pósfai, Arizona State University.

Meteora

Scientists can predict the time of an eclipse, but they cannot predict whether they will be able to see it […]. Meteorology is the repressed content of history.
— Michel Serres[8]

In many ways, its spherical shape lends the Earth a sense of symmetry that is as complete as it is ideal. Even as our cartographic imaginary carves the globe into sovereign parts and their jurisdictions, dividing hemisphere from hemisphere, land from sea, and sea from air, the clinamen threads its complex path across all these parts, obeying no sovereignty or law, save those of physical and chemical interaction. The globe has no symmetry *as such*, only gradients of moisture, temperature, and pressure fighting to reach equilibrium, bandwidths of relative stability whose fate will be broken by infinitesimal fluctuations. The despotic blue sphere collapses this differentiation into a benign picture of balance and finitude when it is anything but.

For example, as the industrialized North pours aerosols into the atmosphere, important equatorial asymmetries are differentially loaded, forcing shifts in precipitation patterns around the tropics.[9] The behavior of the climatic system around the tropics is rich and complex due to powerful heat differentials and the intensity of moisture supply. The relatively high amount of solar exposure on the equator poses a problem in energy transportation that is resolved by a continual genesis of pattern and structure whose morphological paradigm is the convection cell.



Towering some fifteen kilometers above the surface of the earth, the formation of these cells is held in check by the stability of the atmosphere in the area. Much like the crystallization processes where small irregularities in structure initiate the cascading process of molecular transformation, only if a certain threshold of instability is exceeded can the process of cell genesis begin.[10] As tropical ocean temperatures rise, the threshold for this instability also rises because it depends on a temperature differential between warm and cold seawater.[11]

Rain results from this instability. In the fertile equatorial region called the Intertropical Convergence Zone, this effect is organized around a conflict between mechanisms working at two different scales. In the first, the increase in the mean ocean temperature makes the threshold for convection difficult to reach. In the second, a local increase in terrestrial radiation increases evaporation and precipitation. The winner drives rainfall in West Africa.[12]

Let us put this another way. Every single event of fossil fuel combustion in Europe conspires to send a small stream of aerosol particles into the atmosphere. If these particles are emitted in the right kind of weather system, they will be carried high into the atmosphere and transported along air currents toward the Atlantic Ocean. Here, suspended thousands of meters above the seas, the particles will interact with incoming and outgoing solar energy, changing the temperature of the seas below. This affects evaporation levels in the sea and transforms moisture supply to the atmosphere. The shift in moisture supply in turn affects the location, timing, and intensity of the wet season that brings annual rain to the Sahel.

If it is the case that activity in one part of the globe triggers a climatic bifurcation in another then mapping, understanding, and reproducing this system of gradients and differentials constitutes more than a particularly intractable problem in thermodynamic calculus, particle transport, or physicochemical interaction. What it becomes instead is the medium through which a future political claim will be made and a present crime prosecuted.

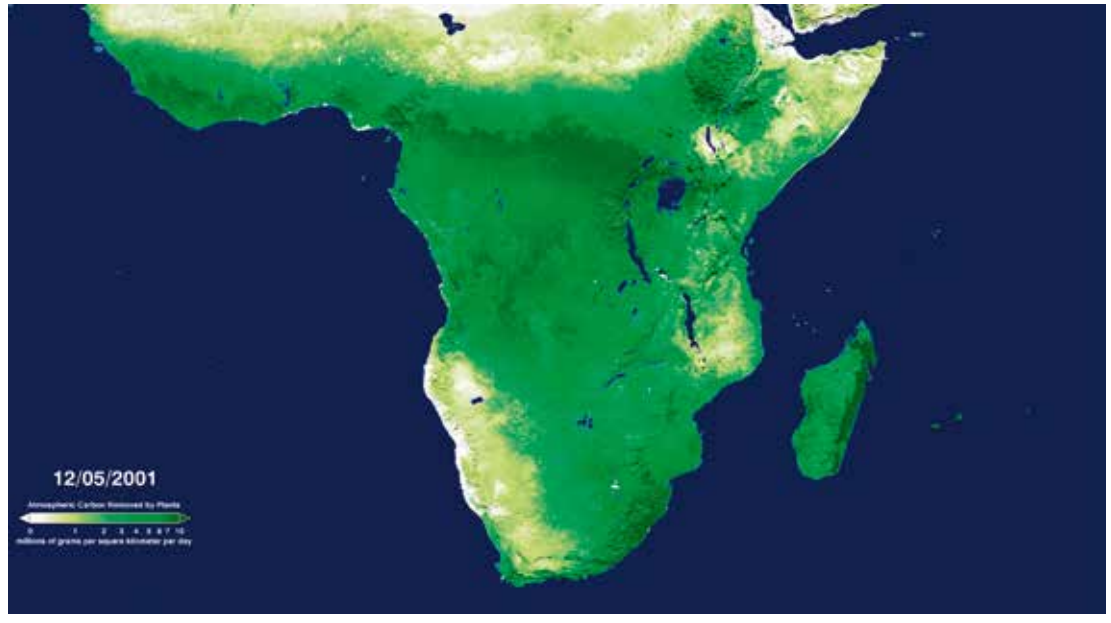
Fig. 6. Biases in the Atlantic Inter-tropical Convergence Zone (ITCZ) in seasonal interannual variations for a coarse and a high resolution, coupled climate model. This visualization effectively shows the movement of the ITCZ, especially the instability of different Sea Surface Temperatures (SST) as they meet and intermix along a shifting equatorial line. The temperature differences indicated here by a red-green color spectrum are a critical factor in the strength of the African Monsoon, which depends on differentials in SST for its intensity. Source: Tom Delworth and Keith Dixon, National Oceanic Atmospheric Administration (NOAA)/Geophysical Fluids Dynamics Laboratory (GFDL), 2008.

The World Dies from the North

…the desert is one of the faces of the Mediterranean.
— Fernand Braudel[13]

Fig. 7. Atmospheric carbon absorption by plants. The fluidity of climate change is poorly understood through cartographic forms of representation. As this still from a visualization demonstrates, the amount of vegetation in the Sahel changes dramatically with the seasons, especially the monsoon rains which sweep up and down the continent. These oscillations repeat but they do so differentially as the patterns shift and adjust according to annual and decadal time scales due to variations in anthropogenic forcing. The variability of this redistribution poses a continual challenge to populations that must find ways to earn a livelihood from the land such as farmers and pastoralists. Image source: NASA/Goddard Space Flight Center, 2009.

The Sahel is one of the most heavily researched climatic zones in the world because it was the first to undergo significant and initially inexplicable climatic variation at timescales longer than a decade—longer therefore than the El Niño Southern Oscillation cycle of seven years.[14] The droughts brought more than deprivation. An institutional apparatus of international aid agencies, donor organizations, financial institutions, medical missions, and other bodies united by concern, contractual obligation, and a legacy of colonial politics arrived soon after. Then, with the waning of the drought in the '90s and the recovery of the Sahel from its extended period of desiccation, a second wave of expertise converged upon the region: meteorologists, climate scientists, anthropologists, and ethnographers. Like an epistemic force field, every problem in the environment would soon attract new forms of knowledge around it. If a complex causal chain stretching over five thousand kilometers threads industrial activity in the Ruhr Valley to the number of water droplets hitting the ground in Senegal, Darfur or Burkina Faso, then another thread can be constructed in the opposite direction. If the first thread weaves through the atmosphere and the ocean, this second thread links distant territories across the surface of the earth. The two threads touch when the rain hits the earth. This moment of contact rests on a plurality of causes that must conspire in just the right way to produce an effect, be it drought or rain, or a delayed



monsoon. Climate science renders this complexity perceptible, threading a line of reasoning that allows us to follow the aerosol on its path and visualize the effects it leaves in its wake. Science is very good at posing these kinds of problems, but it will tell you almost nothing about how to organize kinship structures or manage social bonds in a condition of scarcity. For this one turns to other forms of knowledge.

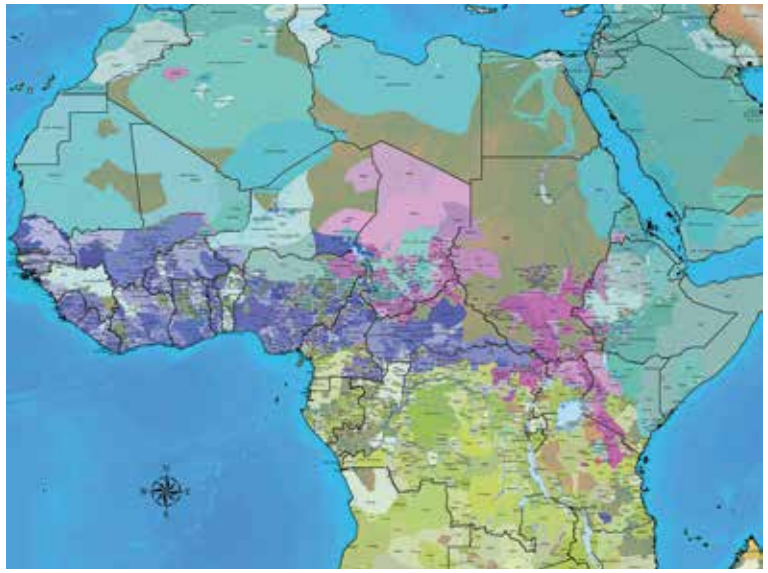


Fig. 8. Languages in Africa. This map of language groups is an indication of the diversity of the Sahel. The viability of rich cultural and spatial traditions is under threat as the quality of productive land transforms in response to anthropogenic climate change. Map © Steve Huffman, Global Mapping International, 2013.

Take the nuanced temporal descriptions of rain within West African communities, which—far from treating precipitation in numerical terms—describe rainfall timing with respect to planting, to its character in relation to runoff, to its effects in terms of crop yield.[15] While scientific reason must isolate each element from its neighbor to uncover correlations and then causal structures, indigenous forms of knowledge conceive of rain as part of an assemblage that has always already held together a series of different elements such as soil, water, and crops. Or consider the names of famine in Darfur, which attract no generic appellation and are instead in each instance referred to through a singular name describing the moral and behavioral effects of the event on the community. Most notably, Fur definitions of famine refer to lived experiences; they distinguish between different effects such as a scarcity or the erosion of social bonds, but they do not refer to starvation or to mortality, nor do they appeal to metrics, statistics, or other quantifiable forms of description, "… rural people of Darfur do not think of the populace as an anonymous aggregate population, but as a moral community."[16]

These short examples of epistemological and cognitive differences are not presented in order to suggest a Babel of communities condemned to speak in indecipherable tongues, only to say that one cannot begin with the presumption of sameness, consistency, or unity among the various parties—be they scientific or indigenous—either in the kinds of claims they make or the meanings one can draw from them. Instead, one must begin with the idea of differences that are real and therefore not simply translatable.[17] Beyond their instrumentality in the region's geopolitics, the multiperspectival character of these various forms of knowledge production do not resolve to form a unified picture.[18] There is no single map upon which each point can finally be plotted, each blank space filled. Because each link in the chain of causes and effects is forged within a unique field of inquiry, it carries with it the tones, manners of speaking, practices, instruments, historical tendencies, and rationalities that structure thought and decision making within that field. Incommensurability between the scales of climatic interaction is as real as the incommensurability between different cognitive and epistemic practices. What is so often forgotten in the discussion of ecology is that difference pertains, and it pertains in such a way as to prevent making one thing the measure of all others. Points will always fail to coincide—and conflict can never cease to ensue.

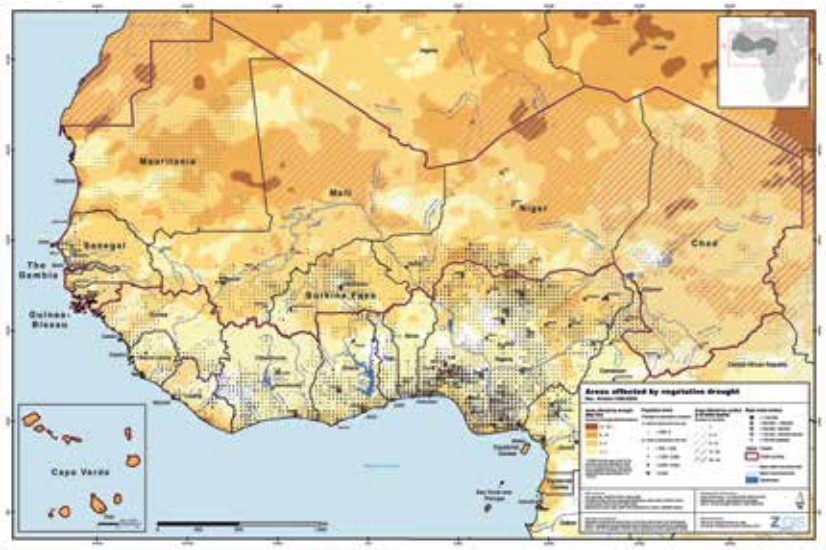


Fig. 9. Areas affected by vegetative drought correlated to areas affected by conflict. Source: UNEP & Centre for Geoinformatics (Z_GIS), University of Salzburg, Austria, October 2010.

The Anthropocenic Equator

> Rather than celebrating or affirming a post-human world, where man no longer deludes himself with regard to his primacy or distinction, and rather than asserting the joyous truth of ecology where life is finally understood as one vast, self-furthering interconnected organic whole, we should perhaps take note of the violent distinction of the human.
> — Clare Colebrook[19]

As of January 2013, all eight situations before the International Criminal Court (ICC) involve African nations between the twentieth northern and the tenth southern parallel. Investigations in Uganda, Democratic Republic of Congo, Central African Republic, Darfur-Sudan, Kenya, Libya, Côte d'Ivoire, and now Mali are confined to a narrow equatorial belt on a single continent, which US security experts now refer to as a "corridor of terror." Within the Western media, war crimes, crimes against humanity, and a legacy of camps, displaced persons, and famines repetitively reinforce the view of the Sahel as a space synonymous with violence and suffering. The perception of a landscape characterized by either warlords, jihadists, and child soldiers on one side, or drought-stricken adults and starving children on the other, leaves sub-Saharan Africa in a bind, caught in a cliché of either hyperaggressivity (genocide, terror, and massacre) or hyperpassivity

(malnutrition and underdevelopment). The very constitution of this crisis and the "concern" it enables form an integral component of the neocolonial machinery and its management of foreign territories.[20] The ICC's international jurisdiction, as set out in the Rome Statute and as outlined at the outset of this essay, is more imagined than real; today it is a tribunal established to judge the sins of the "South."

This South is always posed as a "not-yet" modern, "not-yet" complete project. It is framed in terms of its underdevelopment, described in terms of stagnations and pathologies which cannot but elicit sympathetic aid programs and rescue packages from the ever-vigilant North.[21] There is no more emblematic case of this gaze and its concrete material effects than Africa, whose supposed state of primordial chaos, poised forever on the threshold of arbitrary disorder and habitual violence exists—if indeed it does so —only to reflect back and secure an image of the norms and values of its paternalistic other. For decades, it was assumed that desertification in the Sahel was primarily caused by poor farming practices—that unsophisticated local farmers could not adapt to changing environmental conditions as quickly as they needed to, leading to overgrazing, deforestation, and erosion; similarly, military conflict was and still is too often seen as a simple byproduct of ethnic and religious differences, the manifestation of ancient hatreds and tribal rivalries. More recently, however, anthropogenic climate change has forced a reexamination of these alleged causes.[22]

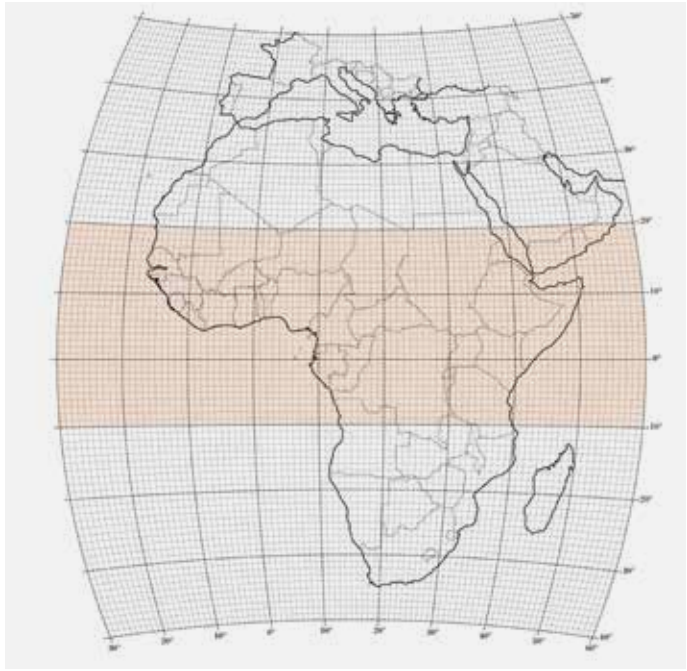


Fig. 10. The Anthropocenic Equator. Today, the remit of the ICC exists between two parallels: 20 degrees north and 10 degrees south. Image: Adrian Lahoud and Alina McConnochie, 2012.

The Sahel is marked by a high variability of annual precipitation. It is certain that heightened competition over shrinking plots of productive land have worked in concert with ongoing governmental and institutional failure to exacerbate existing conflicts, a situation that has been exploited by local elites—not only to further existing claims over land and markets, but also to displace narrations of conflict from a political to an environmental register.[23] Nonetheless, it is also the case that tensions between pastoralists and farmers over dwindling resources has brought different territorial practices into closer proximity. As with the different conceptions of famine and drought noted above, in the case of Fur villagers and Arab pastoralists one finds radically different understandings of, and relationships to, the earth. The former conceive of territory according to a clear north-south striation forming a gradient of decreasing nomadism as one moves away from the desert; while in the latter, spatial practices follow a fluid distribution of opportunity that knows no clear territorial demarcation. These differences are not essentialist traits; in fact, cultural markers such as Arab or African are fixed to livelihoods more than ethnicity. What is happening in the Sahel, besides conflicts over resources, institutional failure, and the instrumentalizaton of disorder by competing political claimants, is a confrontation between different modes of existence, as multiple spatial and cognitive practices superimpose on the same territory.

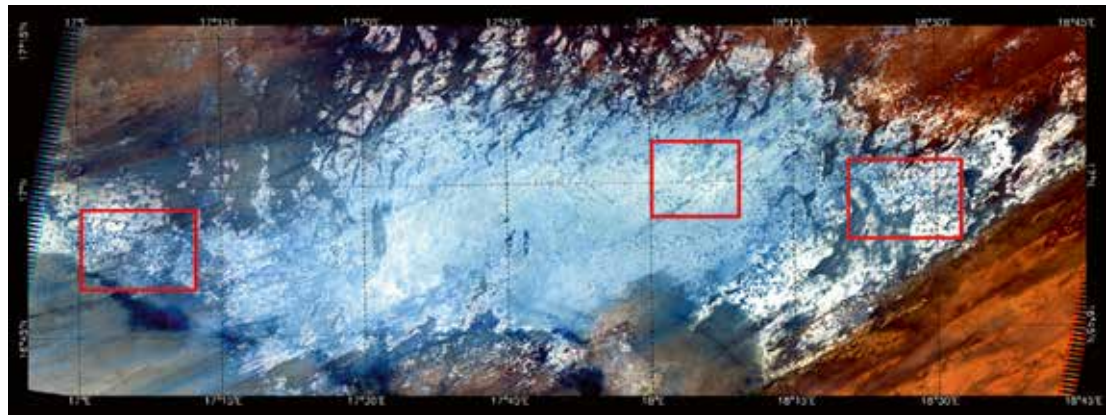
As the Sahara colonizes the Sahel, continuing its expansion down into once fertile landscapes, the deadly march is perfectly captured by the Zaghawa people of Chad and Sudan who say, "the world dies from the north."[24] In a condition of scarcity and within an ever narrowing bandwidth of viability, the peoples of the Sahel are facing pressures to coexist: they make direct contact, they do not coincide, and yet they must still relate.

The Nation Ex-situ

> At least until the process of the dissolution of the nation-state and its sovereignty has come to an end, the refugee is the sole category in which it is possible today to perceive the forms and limits of a political community to come.
> —Giorgio Agamben[25]

Climate simulations reveal more than kaleidoscopic gradients of color; they expose the dynamic and differentiated form of climate impact, the dramatic reorganization of resource availability, biological viability, and human fortune—in short they present a set of new geopolitical maps. The emergence of newly productive land on the one hand and the exhaustion of existing productive territories on the other does more than generate alternative

Fig. 11. The expansion of the Sahara. This image shows study areas over a 45-year time series of dune mobility indicating constant wind velocity over the central Sahara. Due to the paucity of local wind measurements, scientists Pieter Vermeesch and Sebastien Leprince turned to Landsat imagery and a sophisticated form of algorithmic analysis to construct a time series of dune mobility and therefore of wind velocity. This image shows the three study areas for the Bodélé Depression in northern Chad. Image: Pieter Vermeesch and Sebastien Leprince, 2008.







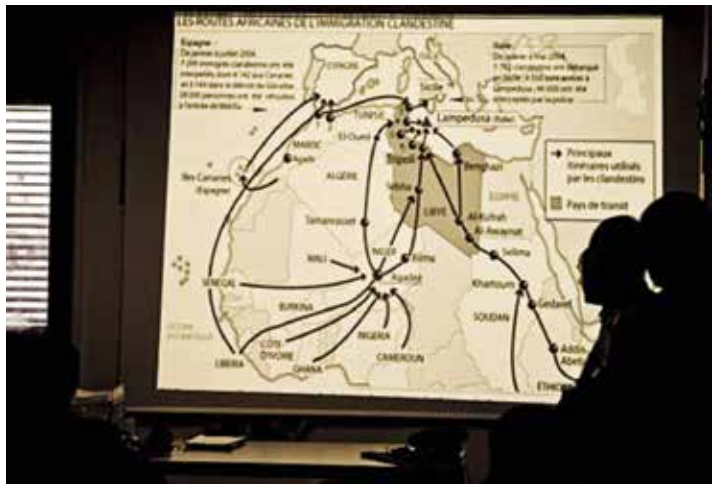
Figs. 12–14. Rescue of Migrants in the Mediterranean Sea. Helicopter footage published on October 24, 2013 by Maltese Coast Guard showing the rescue of migrants attempting to reach Italy. Source: Navy of Malta, 2013.

"patterns" of human settlement; it makes proximate foreign spatial practices, it makes different worlds touch—abundant evidence of which can already be found in our present condition of diasporic movements and displacements.

Because there is no movement without countermovement, and in response to this displacement, today the European border network is conceptualized through the idea of "prefrontiering," a precognition of illegality materialized through treaties and cooperative security frameworks.[26] This infrastructure attempts to counteract refugee movement into the EU by shifting the burden of policing to non-EU states in order to limit the legal obligations conferred upon claimants within sovereign European territory.

Refugee movements intensify during periods of drought. In Africa, drought is thought to be partially responsible for the long-term pattern of urbanization that the continent is experiencing. From the northward migrations out of the Sahara toward the Nile and Levant during the Holocene, to annual routes of herders that follow the rains and pasture, the movement of people through the Sahel and across the Sahara has a long and rich history that, since the great drying of the Sahara thousands of years ago, has been increasingly organized by the coastal area to its distant north, and the cities to its south.[27] The tragedy of today's Mediterranean is that this history of human passage is subject to a calculus in which bodies are marked as weapons on one side, demons on the other. Our own legacy in this story of passage will now resemble a loop, where bodies floating south through the atmosphere eventually receive a ghastly human complement floating north in the sea far below.

Fig. 15. Frontex Risk Analysis Unit. Source: Frontex, *Beyond the Frontiers. Frontex: The First Five Years* (Warsaw, 2010).



The figure of the refugee—the deterritorialized subject par excellence—has a history that has been organized around the twin poles of individuals without a state such as Palestinian refugees, or individuals that must be resettled due to the redrawing of sovereign territorial borders as took place in the former Yugoslavia. International law emerges in response to violence between nation states as a way of redressing conflict, including these issues of refugee status. Legal scholarship has internalized the concept of the refugee only in so far as the two possibilities described above continue to operate.

New kinds of challenges emerge once the very viability of the nation state is threatened with dissolution. In response to this, legal scholar Maxine Burkett radicalizes the very idea of the deterritorialized subject by proposing the concept of "the Nation *Ex-Situ*"; that is to say, a nation for citizens without a territory. When a catastrophic loss of territorial productivity is incurred due to distant causes rather than indigenous acts, a challenge is posed to normative legal principles of harm, redress, and responsibility. Climate migration is thus doubly complex, because its cause is not always attributable while its consequences in terms of *human life considered in terms of numbers* are also unclear, and for these reasons it occupies no distinct legal category.[28] The idea of a "nation ex-situ" then is an attempt to maintain a semblance of continuity through a legal construction that supports projects of cultural protection through the loss of land, resources, and an economy.

The veracity of testimony is one basis on which both genocide and refugee claims will be assessed. Within international law, evidence in the form of human testimony assumed a singular importance after World War II, building on definitions of genocide and crimes against humanity used in trials such as that of Adolf Eichmann.[29] More recently, however, in the case of dangers posed to larger populations by environmental destruction, mathematical and scientific modes of knowing have come to complement human ones.[30] The mobilization of science and especially advanced forms of spatial and statistical analysis occupy an increasingly prominent position within the biopolitical problem of environmental violence.[31] Though they do not touch the body directly, environmental violations affect the milieu that bodies depend upon for their survival.

But what happens to the "era of the witness" when a crime is no longer visible to unmediated human perception? In the case of climate change, climate justice and its deterritorialized claimants, will the era of the scientific model come to replace human testimony in adjudicating humanitarian claims? These new questions in law emerge in recognition of the challenges that climate change brings, the most important of which will be the nexus formed between climatology and criminology.

Climate Forensics

> We are in a different world of proof than that of the archetypical smoking gun.
> — Jack Weinstein, Major General in the US Air Force[32]

Because the mechanics of climate form a complicated transport system, redistributing the effects of pollution according to a process that is nonlinear and transboundary, the space of violation is separated from the space of its repercussion. Those least responsible for carbon emission will be most susceptible to drought and rising sea levels.[33]

Edmund Locard's principle that "every contact leaves a trace"—the very cornerstone of modern forensics—still applies, but with one impossible catch: the contact and the trace drift apart, carried away on ocean currents and diffused into the atmosphere. The earth's climate loosens the bond between cause and effect; it breaks the link between attribution, responsibility, and, potentially, justice. In the elongated space-time between the crime and its consequence, myriad forces intervene—clarifying them becomes not only a scientific priority, but also a political and ethical one.

Furthermore, because the cause is in some way coextensive with everyday life, and because its consequence often occurs beyond our everyday experience of that life, the consequence is no longer recognizable or even proximate to its cause. We are summoned, then, to address a problem whose consequences we may never experience. Testimony, institutions of justice, their jurisdictions and modes of political, legal, or financial redress emerge from events that are more historically/experientially familiar. Unlike many indigenous cosmologies, Judeo-Christian ethics is finally circumscribed by the horizon of *human* experience; Western ethical systems drawn from the Enlightenment and forming the basis for Western law have little purchase on events beyond this horizon—events that are imperceptible without sophisticated technical mediation. In order for an alternative ethico-legal reasoning to secure itself, a new kind of aesthetic and epistemic space must be established. This fragile tethering of different ways of knowing calls for a style of thought that is more *attentive* to shifting sites of veridiction, matters of sense and intelligibility. Much is at stake in holding this diverse series together (as we will see when we turn to the 2009 Copenhagen Climate Conference in the conclusion of the essay); displacing violence from the battlefield to the forum already required no less. Before this, however, it is worth considering climatological reasoning and the question of scale a little more closely since it is here in the calculus—in fact, in the very mathematics—of the model that the political insists on re-inscribing itself.

All Things Being Equal

> …when a concurrence of causes produces an effect, these causes have to be studied one at a time, and their laws separately investigated […] since the law of the effect is compounded of the laws of all the causes which determine it.
> —John Stuart Mill[34]

Because any event, climatic or otherwise, is irreducible to a single explanation, one way to imagine each event is as an outcome of causes conspiring, or more simply as other events intersecting. In turn, because each cause is also an event in itself with its own private network of precursors, it is impossible to fully explicate any single event since this would mean following an infinite network. This is not really a problem, however, since some causes will contribute to the event's character more than others.

By disturbing this network of relations we can test which connections are relevant: an easy way to imagine this is to think about cutting threads on a web—if the web stays the same shape the thread was not structurally important. To "explain" an event is to set out causes with regard to a context; implicit in this idea is that any reliable explanation will attend to the most relevant of causes—effectively pruning back unimportant threads in order to limit the potentially infinite space of explanation.[35] In turn, this means that any explanation is always indeterminate since it rests on a network of amputated relations which are implicit or presupposed without being stated, either because they are thought not to bear upon the event significantly, or because they are commonly understood and do not need repeating. The Latin phrase *ceteris paribus*, meaning "all other things being equal"—or, less literally, "in the absence of disturbing factors"—refers to this method first described by Mill and found within different forms of reasoning, of *isolating* causal factors from a complex network.[36]

Let's now consider the way some climatic zones produce a morphologically distinct type of weather pattern. The pattern exists in series, repeating annually over each wet season or, as with the El Niño cycle, every seven years; none of these forms are identical and yet they share a recognizable structure. Then let's suppose that at some point in time, a mutation—that is to say a signal—emerges from the noise of "normal" morphological variability (the norm is in itself entirely contingent, the invocation of nature's end—if it means anything it points only to the difficulty of establishing a baseline or reference in the sea of temporal variation). In attempting to identify this mutation, different causal factors will be isolated step-by-step in a simulation to see if a *correlation* can be found between a specific cause and this specific mutation or, as in the words of the previous analogy, a thread whose loss changes the shape of the web. However, correlation in itself does not give causation—it doesn't say anything about the process that makes these variables relate. In order for *causation* to be determined, first there must be proof

that this deviation is not explainable by other causes.[37] Furthermore, some mechanism or relation must be proposed for connecting the elements together.

Climatologists have learned to exploit the unique, nonlinear nature of climatological patterns. The fact that no two climate patterns are the same (despite sharing morphological similarities), far from being a problem, is precisely what allows for a forensic climatology: spatiotemporal pattern is the key. The difference is much like a fingerprint. Though left and right finger prints are expressions of the same gene, the difference between them results from the reciprocal interaction between genes and an information-rich environment of enzyme gradients, the relation between which guides morphological development during embryogenesis. The path dependency of this process gives a unique signature on left and right prints since each print actualizes in response to a unique context of developmental noise. Climate forensics takes this principle of identification through path dependency a step much further. Instead of simply noting the shape of left and right prints in order to register formal difference, it will attempt to explain *differentiations*; that is, to uncover why the process of morphogenesis unfolded in exactly this as opposed to any other way.

It is here that a durable claim about causal relations begins to be threaded *through* the different elements of the climate system. To accomplish this feat, the question of scale is paramount. Take aerosol dispersion: even if it were computationally possible, little would be gained by tracking every single one of the 10^{40} particles in the atmosphere. Similarly, conceiving aerosol content as a global mean, in the way that CO_2 is measured, would reveal almost nothing. In the first instance, the explanatory mesh is overdetermined, carrying too high a resolution and too much redundant information (taking into account every single particle); in the second case, the explanatory mesh is underdetermined and has too coarse a resolution (a global mean).[38] What is missed in both these examples is the spatiotemporal pattern. The epistemic frame that tries to capture the salient ontological characteristics is poorly calibrated, there is something in between that must be understood—namely, scale; that is to say, an objective correlation between the ontological causal structure and its reproduction in some epistemic frame. In this sense, we can understand the process of scalar individuation by which a climate model is progressively specified in scale until it is able to reliably capture the relevant parts of the problem in question much like a sieve that must be calibrated so that its openings catch the correctly sized elements.

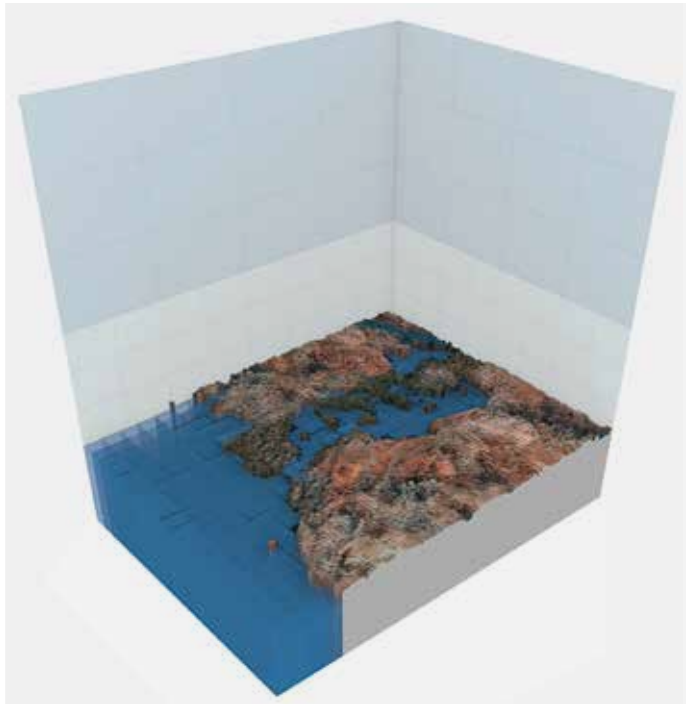


Fig. 16. Scalar subdivision of earth within a climate model. There have been significant advances in the resolution of climate models in the last twenty years as computational speed has increased, and yet many important phenomena such as aerosols and clouds exist at a sub-calculable scale—being too small to be caught by existing methods of spatial subdivision. There is no agreement on the optimal grid type, with some scientists and mathematicians arguing for the dynamic transformation of resolution in response to the scale of phenomena that must captured. Others argue for an even grid coverage, suggesting that areas with seemingly little activity may nonetheless play an important, if as yet unknown, role. Image: Adrian Lahoud and Jose Sanchez, 2012.

These five points—correlation, causation, path dependency, determination, and scale—form the basis for forensic climatology. The importance of this form of reasoning for constructing durable claims about climate change and climate attribution is not in doubt. What is as yet unclear, however, is the way this form of reasoning enters into and shapes nonscientific disputes over climate and climate justice: for hidden within the amputated web of relations that structure such reasoning is an indeterminate payload, one with the capacity to radically repoliticize the apparent objectivity of any scientific claim.

The Third Degree

> We have been asked to sign a suicide pact.
> — Lumumba Di-Aping[39]

Computational models seek to explain and predict the world's climate. They can be understood in purely scientific terms, but only at the expense of unmeshing the models from the political and economic forces in which they are installed and for which they are called upon to work. By locating these models against the milieu of conflicts and negotiations that characterize the struggle over global carbon capacity, the objectivity of science can be reframed in terms of its relevance within a political force field which scientific attention both enters into and shapes. A problem can be objective in a scientific sense yet nonetheless partial in a political sense, as we shall see with the argument about global average temperature increase.

According to the Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013, the Earth's temperature is likely to rise by 1.5 degrees according to most long-term scenarios (projection for 2081–2100) and 2.0 degrees for many others.[40] As a nonscientist, there is no reason to question the accuracy of this figure or the *objectivity* of the reasoning that lies behind it, but there are very good reasons to scrutinize its *relevance* within discourse on climate change. First, the figure is a global average and conceals the uneven transformation of the planet's climate; second, it obscures the fact that climate negotiations are first and foremost economic negotiations, arguments over growth rather than negotiations over temperature; third, it invites public misperception as to the consequences of even small temperature changes since humans experience far larger changes over the course of a normal day.[41]

Economic activity is highly carbon dependent: industrial and agricultural production as well as consumption link GDP to emission. For these reasons, over the next century, forums charged with allocating global carbon

capacity will become paradigmatic spaces of conflict both between states and nonstate actors such as corporations. The 2009 Climate Change Conference in Copenhagen, as well as Kyoto before it, were unique historical events. Despite Copenhagen's failure, it is worth reflecting on the unprecedented strangeness of a forum in which world leaders ostensibly gather to discuss the acceptable level of the earth's temperature.

During the 2009 Copenhagen Climate Conference the public debate was framed by two simple questions: Would an accord be signed or not? And what would be an acceptable temperature increase? The latter question revolved around a series of figures: would it be 1.5 degrees, 2 degrees, 3 degrees, 3.5 degrees? But in the midst of the negotiations, and with the fate of Africa's Sahel at stake, a transformative moment occurred which welded the scientific and the economic to the political again. On December 8, 2009, during a hastily convened private press conference, the Sudanese diplomat representing the G77 group of 132 developing nations, Lumumba Di-Aping, broke down and uttered a distinctly undiplomatic phrase, "We have been asked to sign a suicide pact," in reference to the so called "Danish text" that had been tabled, and its proposed 2 degree global average increase. This brief eruption carries into speech within a public forum the reality of a private calculus and its implicit presupposition, linking responsibility for climate change, economic activity and, most importantly, foregrounding the *unequal* distribution of anthropogenic impact. The proposed global average of 2 degrees meant 3.5 degrees in many of the nations that Di-Aping represented—a catastrophic result for sub-Saharan Africa.[42] Committing the G77 to the Danish proposal would not only condone this catastrophe, it would legitimize it: the organization was being invited to become party to the devastation of its members.

Why should temperature increase be posed at a global scale rather than a local one, which would allow for an assessment of impact according to specific populations? The answer is both technical and political. It is technical in so far as smaller scale predictions are more difficult, which is why predicting the climate is easier than predicting the weather. It is political—not because the average figure is subjective, but because its very objectivity operates at a scale that mystifies the real and uneven extent of change; what is at stake here is the *relevance* of the truth—its truer truth—and not its objectivity or disputability. The conceptualization of climate change as a global average does little to clarify its impact on people.[43] If the scale of argument is shifted from a planetary one to a local one, different pictures emerge. In the Sahel, the impact of water stress, reduced crop yields, and new disease vectors could lead to an additional 300,000 deaths on the continent per year in the immediate term, with double that number in the coming decades.[44] This does not include any possible deaths caused by the exacerbation of existing conflicts and refugee movements due to war and famine.





Fig. 17. (above) Lumumba Di-Aping. Press conference December 11, 2009. United Nations Climate Change Conference, Copenhagen, Denmark. Still image capture from "Lumumba Di-Aping of the G77—The Most Important COP Briefing the World Never Heard | Part 5," http://youtu.be/Vtjbuq4fsRY.

Fig. 18. (below) Luis Gabriel Moreno Ocampo, first Prosecutor for the International Criminal Court, Tallinn, February 7, 2012. Photo: Estonian Foreign Ministry, Creative Commons License.

As the climate conference disbanded, with news of Di-Aping's claim of "climate genocide" spreading, hundreds of thousands of protestors gathered outside the Bella Centre in Copenhagen. Di-Aping's response to the colonial mentality of the G20 ("we have been asked to sign a suicide pact") and his invocation of the death camps of the Second World War ("climate genocide") were unexpected. His dissident utterance succeeded in breaking all protocol. He was immediately criticized by conservative sections of the media who, indignant that he had so intentionally failed to follow the norms of diplomacy, called for his resignation. The idea that a Sudanese person would speak out in such a way in the context of a major international conference elicited derisory comments that suggested a lack of responsibility, disingenuousness, and unproductive hyperbole. Di-Aping's status as a speaking subject and chairman of 132 nations was called into further question because of the continuing criminal proceedings against President Omar al-Bashir regarding war crimes in Darfur. What many commentators failed to realize is that it was precisely Di-Aping's proximity to events in Darfur that provided him with a visceral sense of what a change in temperature could mean.

Di-Aping's statement disrupted the existing order of what can and cannot be said, what can and cannot be seen, and what can and cannot be constituted as a problem. After this disruption a new terrain of relevance was produced, no longer posed in terms of global averages and degrees but rather in terms of mortality, livelihoods, and the differential impact of heat. Beyond even this however, a far more radical reading might be possible: Di-Aping's comments constitute more than an articulate plea for participation in dialogue; they might be much more still than a dissident speech act or disruption of the diplomatic order. Is it not possible that what this statement amounted to is a political demand for a new type of mathematics—a differently-scaled calculus? His call, then, is an attempt to reestablish the *proper* political scale within a debate about temperature increases in order to make specific populations visible and calculable within the model and therefore the argument.

Di-Aping's deliberate violation of diplomatic protocol should finally be read in these terms, since what the event in Copenhagen conclusively revealed is that within each degree of temperature increase, billions of "first world" dollars are congealed. Fossilized deep within every scientific model and dispute over average temperature increase is a nonscientific, ethico-political paradigm. Inside every simulation, inside every single degree, a new calculus of life and death is disguised.[45]





Fig. 19. (left) Kuwait Oil Fires, 1991. Photo: Robert Bumpas/National Science Foundation. Creative Commons License.

Fig. 20. (right) Ruhr Valley Industrial Centre, 2009. Photo: AP Photo/Frank Augstein.

The Chain of Immanence

> UN climate change negotiations are not "environmental": they are about the economic future of nations.
> — Radoslav S. Dimitrov[46]

In the 1991 Gulf War, for every day the fires caused by the detonation of almost six hundred Kuwaiti wellheads burned, they released ten times more oil-related pollutants than the daily industrial output of the United States. In this comparative fact lies an interesting equation, a certain kind of equivalence between war and peace, captured well by Michel Serres in the epigraph to this essay when he writes: "Our peacetime economic relations, working slowly and continuously, produce the same results as would a short global conflict, as if war no longer belonged to soldiers alone now that it is prepared and waged with devices as scientific as those used by civilians in research and industry. Through a kind of threshold effect, the growth of our means makes all ends equal."[47] In some sense then, what for Serres separates the state of war from the state of peace is a speed, a difference in pattern or intensity, a distribution in time and space.[48]

It is now possible to precisely reframe the question posed at the beginning of this essay: can we imagine a form of violence without a violent event? The question we face now is: can we clarify the genesis of structures that authorize indirect violence? Or in other terms, can we bring the contact and the trace back together again?

Do we risk making familiar forms of violence more ambiguous and therefore less operative through the concept of structural violence? It is an important question: if everything is violent, then nothing is violent. This hesitation rests on a flawed premise however: "structure" is not everything. Nor is it simply a punctually violent event, and here lies the philosophical and political challenge: to discern with enough precision and attention the action of this network and its agents, to follow the threads of relation where they lead, to rigorously unfold the complex causal links in this thing called "structure." The purpose of this new cartography is not to absolve agents or individuals from responsibility, as if the structure itself should be indicted. On the contrary, it is to make individuals aware of and responsible for the consequences of their actions, whether they represent themselves or larger entities such as nations and corporations.

In the indigenous understanding of famine and territory, the medical calculus of mortality, the statistical patterning of genocide, the scale of mathematical models, the visualizations of sea-surface temperatures, the plurality of legal structures and their conflicting jurisdictions, in satellite photos registering changes in vegetation and tracking boats packed with migrants attempting to cross the Mediterranean without succumbing to the seas, one finds epistemic frames and virtues that do not coincide to form a single world but rather superimpose like the split perspectives in a fractured mirror. So too with the various forums and spaces of discourse that this visual evidence enters into, and where it attempts to make itself heard: the hotel conference halls used for an ICC investigation or to host a climate summit, the press conferences, the rural councils, the courts and parliaments, and academic institutions. Each ontological, epistemic, and discursive individuation—each phenomenon, frame, and forum—creates its own distribution of relevant and irrelevant points, a unique order of what can be counted, what can be said, what can be made visible.

And what is now becoming visible, what is being represented, made available for experience and also for judgment, is more than a set of bonds that tie together distant fates. What appears today is the extension of a colonial project into the atmosphere itself. Like the industrial age that produced it, the Anthropocene is playing host to its own scramble for sovereignty, a colonial drive that now extends into the air and its capacity for life. As with the Berlin Conference of 1884 before it, Copenhagen assumed all the protocols and formalities of international law and diplomacy, and though the conflict is now over atmospheric resources like carbon, rather than terrestrial resources like ivory, Copenhagen, like Berlin, attempted to exclude African representation from the forum of negotiation. Lumumba Di-Aping was one of the only delegates present to recognize Copenhagen for what it was—a crime scene.[49] His speech act reminds us that when it came to the decolonization of land, the law followed force. As the earth closes in on us, what makes us think that decolonizing the sky will be any different?

1 Michel Serres, *The Natural Contract* (Ann Arbor: University of Michigan Press, 1995), 32.

2 The term "monotheism" is used here to refer to any system of thought with a consistent ontological and epistemological structure.

3 The French *problématique* is used to indicate the way this concept emerges from a history of French epistemological thought, primarily in the writings of Gaston Bachelard and Michel Foucault, and then especially later in Gilles Deleuze's *Difference and Repetition* (London: Continuum, 2004).

4 Gilles Deleuze, *The Logic of Sense* (London: Continuum, 2004), 306–07.

5 Unlike CO_2, which is temporally long-lived and spatially diffuse, aerosol particles remain suspended in the atmosphere for less than a week and are therefore localized within parts of the earth's atmosphere. Nonetheless they have a significant, if more spatio-temporally patterned, effect on climate. See also J.M. Prospero, R.J. Charlson, V. Mohen, R. Jaenicke, A.C. Delany, J. Moyers, W. Zoller, and K. Rahn, "The Atmospheric Aerosol System: An Overview," *Review of Geophysics and Space Physics*, vol. 21, no. 7 (1983): 1607–29; and S.K. Satheesh and K. Kirshna Moorthy, "Radiative effects of natural aerosols: A Review," *Atmospheric Environment*, vol. 39 (2005): 2089–110.

6 H. Moosmüller, R.K. Chakrabarty, and W.P. Arnott, "Aerosol light absorption and its measurement: A review," *Journal of Quantitative Spectroscopy & Radiative Transfer*, vol. 110 (2009): 844–78.

7 C.S. Zerefos, V.T. Gerogiannis, D. Balis, and A. Kazantzidis, "Atmospheric effects of volcanic eruptions as seen by famous artists and depicted in their paintings," Atmospheric Chemisty and Physics, vol. 7 (2007): 4027–42.

8 Michel Serres, *The Birth of Physics* (Manchester: Clinamen Press, 2000), 67.

9 Leon D. Rotstayn and Ulrike Lohmann, "Tropical Rainfall Trends and the Indirect Aerosol Effect," *Journal of Climate*, vol. 15 (2002): 2103–16.

10 Gilbert Simondon uses this example to introduce the concept of transduction, finally extending it beyond the action of crystallization to describe the structuring of any metastable field. See Gilbert Simondon, "The Genesis of the Individual," in Jonathan Crary and Stanford Kwinter, eds., *Incorporations* (New York: Zone Books, 1992).

11 Alessandra Giannini, "Mechanisms of Climate Change in the Semiarid African Sahel: The Local View," *Journal of Climate*, vol. 23 (2010): 743–56.

12 The key role played by Sea Surface Temperatures (SST) has been the subject of a series of landmark papers published by Alessandra Giannini at The Earth Institute at Columbia University in collaboration with colleagues in other climate research centers in the United States. Building on important work by Leon Rotstayn and colleagues at the CSIRO on the sensitivity of SST to aerosol emission, this research reverses decades of orthodoxy that argued that local anthropogenic transformation (i.e., African agricultural practice) were responsible for desertification. The work concludes by proposing that persistent drought in the Sahel is not local in origin but rather the result of an increase in SST in which aerosol emission plays an important role. See Michela Biasutti and Alessandra Giannini, "Robust Sahel drying in response to late 20th century forcings," *Geophysical Research Letters*, vol. 33 (2006), L11706. See also Leon D. Rotstayn and Ulrike Lohmann, "Tropical rainfall trends and the indirect aerosol effect," *Journal of Climate*, vol. 15 (2002): 2103–16. For an overview see Alessandra Giannini, Michela Biasutti, Isaac M. Held, and Adam H. Sobel, "A global perspective on African climate," *Climatic Change*, vol. 90 (2008): 359–83. See also Alessandra Giannini et al., "A unifying view of climate change in the Sahel linking intra-seasonal, interannual and longer time scales," *Environmental Research Letters*, vol. 8 (2013), 024010.

13 Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Phillip II* (Berkeley and Los Angeles: University of California Press, 1995), 24.

14 The word Sahel is thought to mean "shore," as in the Arabic *Sahil,* which refers to the edge where land meets sea—the Sahara desert forming an analogous edge with the savannah. In fact the word Sahel becomes—among West African Arabs, initially—the word for the sea to their north, that is to say the Mediterranean.

15 C.T. West, C. Roncoli, and F. Ouattara, "Local perceptions and regional climate trends on the central plateau of Burkina Faso," *Land Degradation & Development*, vol. 19, no. 3 (May/June 2008): 289–304.

16 In Darfur the names of famine refer to conditions of social breakdown—the suspension of community and the promise of its reformulation at some point in the future. Alex De Waal notes an important distinction in naming deadly famines that do not merit a separate name but are simply appended with the term "famine that kills" (*maja'a al gatala*). He concludes that this state marks a crossing "where naming breaks down" and, more critically perhaps, that "the destitution and social breakdown it causes are more significant for the sufferers than the fact of mortality." Alex de Waal, *Famine That Kills: Darfur, Sudan* (New York: Oxford University Press, 2005), 75. For a comprehensive treatment of the calculus and the politics of humanitarian aid, see the chapter "Arendt in Ethiopia" in Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2011), 27–62.

17 See Bruno Latour, *An Inquiry into Modes of Existence* (Cambridge MA: Harvard University Press, 2013).

18 See Eduardo Batalha Viveiros de Castro, "Exchanging Perspectives: The Transformation of Objects into Subjects in Amerindian Ontologies," *Common Knowledge*, vol. 10, no. 3 (Fall 2004), 463–84.

19 Claire Colebrook, "Extinction: Framing the End of the Species," in Colebrook, ed., *Extinction* (Living Books About Life/Open Humanities Press, 2012), unpaginated.

20 See also Arturo Escobar, *Encountering Development: The Making and Unmaking of the Third World* (Princeton: Princeton University Press, 1994).

21 See also Franco Cassano, "For a Thought from the South," in *Southern Thought and Other Essays on the Mediterranean* (New York: Fordham University Press, 2012), 1–6.

22 In a 2007 *Washington Post* article, UN Secretary-General Ban Ki-moon proposed anthropogenic climate change as a contributor. Ban Ki-moon, "A Climate Culprit in Darfur," *Washington Post*, June 16, 2007. See also note 12 above.

23 H. Verhoeven, "Climate Change, Conflict and Development in Sudan: Global Neo-Malthusian Narratives and Local Power Struggles," *Development and Change*, vol. 42, no. 3 (2011): 679–707; and Mathieu Couttenier, and Raphael Soubeyran, "Drought and Civil War in Sub-Saharan Africa," *The Economic Journal* (2013), doi: 10.1111.

24 Alex De Waal, "Is Climate Change the Culprit for Darfur?" African Arguments, June 25, 2007, http://africanarguments.org/2007/06/25/is-climate-change-the-culprit-for-darfur/.

25 Giorgio Agamben, "Beyond Human Rights," in *Means without End: Notes on Politics*, trans. Vincenzo Binetti and Cesare Casarino (Minneapolis: University of Minnesota Press, 2000), 15–26, at 16.

26 See Anthony Lodge, *Beyond the Frontiers. Frontex: The First Five Years* (Warsaw: Frontex, 2010).

27 Terms like "displacement," "migration," and "refugee" are tactically adopted and refused, in that they form the frame through which political claims can be made. Because the political management of movement depends on these terms, the legal thresholds that distinguish between the practices and therefore the actors involved become heavily contested. More recently, paleoclimatologists suggest that the great drying of the Sahara can only be explained by simulating non-anthropogenic aerosols in the atmosphere, i.e. the influence of Saharan dust. For a long-term history see Rudolph Kuper and Stefan Kröpelin, "Climate-Controlled Holocene Occupation in the Sahara: Motor of Africa's Evolution," *Science*, vol. 313 (2006): 803–07.

28 See Maxine Burkett, "The Nation *Ex-Situ*: On climate change, deterritorialized nationhood and the post-climate era," *Climate Law*, vol. 2 (2011): 345–74.

29 For a discussion of shifting ideas of testimony, see Thomas Keenan and Eyal Weizman, *Mengele's Skull: The Advent of a Forensic Aesthetics* (Berlin and Frankfurt am Main: Sternberg Press and Portikus, 2012).

30 See Solomon M. Hsiang, Marshall Burke, Edward Miguel, "Quantifying the Influence of Climate on Human Conflict," *Science*, vol. 341, no. 6151 (September 2013), doi: 10.1126/science.1235367.

31 Tal Golan, "A preliminary history of epidemiological evidence in the twentieth-century American Courtroom." Unpublished manuscript, 2011. See also Sheila Jasanoff, "Science and the Statistical Victim: Modernizing Knowledge in Breast Implant Litigation," *Social Studies of Science*, vol. 32, no. 1 (Feb. 2002): 37–69.

32 Weinstein speaking in reference to the 1984 Agent Orange claim lodged by US veterans of the Vietnam War against the government. Quoted in Golan, "A preliminary history," 7.

33 African nations, in both absolute and per capita terms, are insignificant sources of emissions on a global scale. On average, each resident of sub-Saharan Africa produces less than a ton of CO_2 per year, compared with an average European's annual output of 8.2 tons of CO_2 and the average North American's of 19.9 tons. Whether or not most sub-Saharan countries sign up to a post-Kyoto deal will have little impact on global emissions. However, cases such as Darfur are being held up as cautionary tales for the potential impact of climate change everywhere. In other words, African nations are not the intended audience of the post-Kyoto debate, but they are part of the evidence being used to make it. See Oli Brown, Anne Hammill, and Robert McLeman, "Climate change as the 'new' security threat: implications for Africa," *International Affairs*, vol. 83, no. 6 (2007): 1141–54.

34 John Stuart Mill, *Principles of Political Economy with some of their Applications to Social Philosophy* (London: Longmans, Green and Co., 1843), VI.9.3.

35 See also Alan Garfinkel, *Forms of Explanation: Rethinking the Questions in Social Theory* (New Haven: Yale University Press, 1981).

36 As a conditional statement, it makes any cause dependent on a supposition, and therefore non-universal, and only generalizable if said conditions are met. See also Marc Lange, "Who's afraid of *Ceteris-Paribus* Laws? Or: How I Learned to Stop Worrying and Love Them," *Erkenntnis*, vol. 57, no. 3 (2002): 407–23.

37 Nonlinear systems like the climate produce signature bifurcations in response to different forcings. Exploiting this path dependency by exploring a set of counter-factuals allows for different forcings to be compared to observations.

38 Biological mathematicians Giuseppe Longo and Francis Bailly argue that the impossibility of computing non-linear behavior in open systems can be attributed to the non-trivial difference between the continuous nature of the phenomena and the repeatable addressability of discrete points in the systems used to describe them. For Longo and Bailly, it is possible to say that language and matter are incommensurable, or perhaps that while computers can repeat, only God can miscalculate. Giuseppe Longo and Francis Bailly, "Objective and Epistemic Complexity in Biology (Towards a 'conceptual organization')," invited lecture, International Conference on Theoretical Neurobiology, New Delhi, National Brain Research Centre, February 2003. See also Guiseppe Longo, "From exact sciences to life phenomena: following Schrödinger and Turing on Programs, Life and Causality," *Information and Computation*, no. 207 (2009): 545–58, at 553.

39 "Di-Aping first attacked the 2 degrees C warming maximum that most rich countries currently consider acceptable. Referring continuously to science, in particular to parts of the latest IPCC (Intergovernmental Panel on Climate Change) report, which he referenced by page and section, he said that 2 degrees C globally meant 3.5 degrees C for much of Africa. He called global warming of 2 degrees C 'certain death for Africa,' a type of 'climate fascism' imposed on Africa by high carbon emitters. He said Africa was being asked to sign on to an agreement that would allow this warming in exchange for $10 billion, and that Africa was also being asked to 'celebrate' this deal." Adam Welz, "Emotional scenes at Copenhagen: Lumumba Di-Aping @ Africa civil society meeting—8 Dec 2009," http://adamwelz.wordpress.com/2009/12/08/emotional-scenes-at-copenhagen-lumumba-di-aping-africa-civil-society-meeting-8-dec-2009/, last accessed November 2013.

40 For more detailed analysis of the scenarios, see Thomas Stocker, Qin Dahe, Gian-Kasper Plattner, et al., "Working Group I contribution to the IPCC Fifth Assessment Report Climate Change 2013: the Physical Science Basis," Intergovernmental Panel on Climate Change, 2013, 53.

41 In his otherwise excellent book, *A Vast Machine*, Paul Edwards states: "On an idealized view, high-quality scientific knowledge should and will automatically command policy choices, limiting disputes by partisans to no.s of implementation. Yet the implication of this profound authority is that credible science can be translated directly into political power." This is indicative of a certain technocratic concept of information and its relation to decision making. What is in question here is exactly the opposite: less the credibility of science vis-à-vis science and more the relevance of science vis-à-vis politics. Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data and the Politics of Global Warming* (Massachusetts: MIT Press, 2010), 406.

42 See Brodie Ramin, "Slums, climate change and human health in sub-Saharan Africa," *Bulletin of the World Health* Organization, vol. 87 (2009), 886–86. Increasingly there are calls to link climate change analysis to health and mortality projections. See Simon Lewis, "It's time for a body count," *Guardian*, February 26, 2008. Mortality rates are difficult to estimate due to the mixed causal factors involved. Nonetheless some attempts have been made. For a review see Andrew C. Revkin, "Forum Says Climate Shift Brings Deaths," *New York Times*, May 29, 2009.

43 Part of the reason for this is that scientific research has been directed toward global models, in part due to the need to understand the climate system in comprehensive terms, but also because this is where funding has been directed. Further, there are real technical limits on existing capacities to model impact at smaller resolutions.

44 Andrew C. Revkin "Forum says Climate Shift Brings Death," *New York Times*, May 29, 2009.

45 For further elaboration on Copenhagen see also Adrian Lahoud, "The Third Degree: Interrogating the Scale of Climate Conflict," in Ines Weizman, ed., *Architecture and the Paradox of Dissidence* (London: Routledge, 2013).

46 Radoslav S. Dimitrov, "Inside UN Climate Change Negotiations: The Copenhagen Conference," *Review of Policy Research*, vol. 27, no. 6 (2010): 795–821.

47 Serres, *The Natural Contract*, 32.

48 See also Paulo Tavares and Adrian Lahoud, "Fifth Geneva Convention: Nature, conflict, and international law in the Anthropocene," http://www.forensic-architecture.org/wp-content/uploads/2012/10/5th-Geneva-Convention-Tavares-Lahoud.pdf.

49 The crime scene was even marked with blood: Claudia Salerno, G77 member and Lead Climate Negotiator for Venezuela was forced to slam the table in order to be heard during a session in which the chair continually ignored her requests to speak; eventually, she continued her speech with her bloodied palm raised in front of her.

Case: Guatemala

Forensic Architecture in collaboration with SITU Research



Fig. 1. Ríos Montt, who exercised his right to remain silent during the entire trial in 2013, made a long speech during its closing stages. He pledged innocence, alleging that he was not in control of the army and that military troops operated with "autonomy." He insisted that his plan was to build national cohesion, which he called *guatemalidad*. With these words, Ríos Montt restated the ideology behind the crimes that he sought to deny: the erasure of difference within society was central to the formation of the modern state of Guatemala and elsewhere in postcolonial Latin America. Photo: Forensic Architecture.

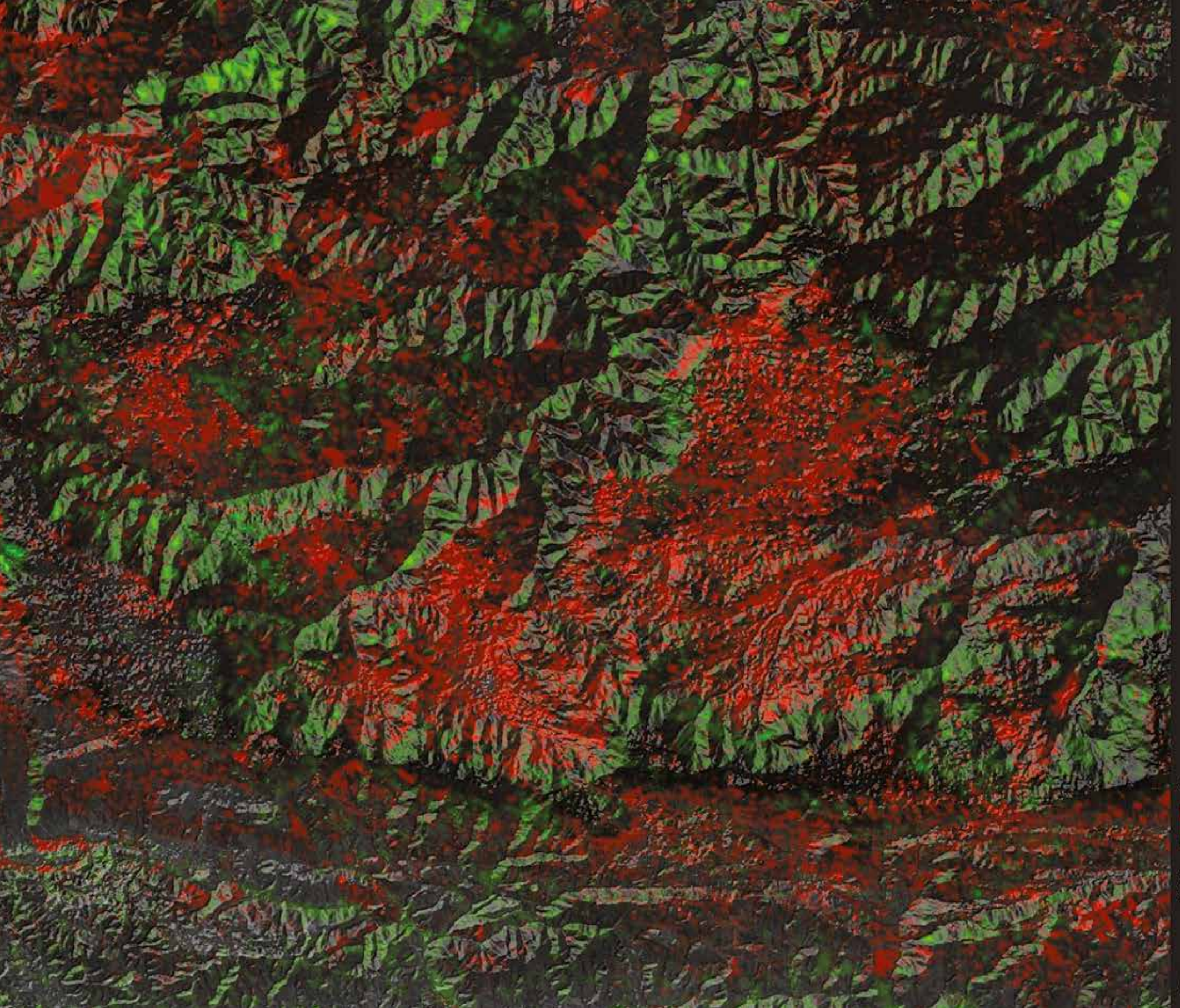
Fig. 2. (overleaf) Transformations in vegetation cover in the highland region of the Ixil Triangle, as seen in an NDVI analysis on two 1979 and 1986 satellite images. During the violence in the early '80s, this landscape went through a radical environmental reconfiguration. Visualization: Forensic Architecture and SITU Research.

The Earth Scorched: Environmental Violence and Genocide in the Ixil Triangle, Guatemala, 1980–1983

Forensic Architecture's research into the Guatemalan Civil War (1960–1996) focused on the violence inflicted by state security forces—both military forces and military-organized civil militias—on the Ixil Maya people in the Quiché region of the West Guatemalan highlands between 1978 and 1984, and in particular on the period of the dictatorship of General Efraín Ríos Montt (March 23, 1982–August 8, 1983). Our research focused on the analysis and presentation of what we referred to as "environmental violence"—the destruction of the natural and built environment as part of a military strategy.

During the years Ríos Montt was in power the military considered the majority of the Ixils as "subversives," accusing them of actively participating in or aiding the activities of the guerilla forces that were based in the area. More generally, the state regarded the Ixil way of life, along with those of many other indigenous groups in Guatemala, as autonomous and thus a threat to the state order. In the remote highlands of this region, the military classified many areas as "red zones" and set out to exterminate what it considered to be the "social base" of guerrilla support. The torture and massacres of men, women, and children were combined with forms of population control that resulted in the complete transformation of the built and natural environment in which the Ixil lived; that is, in the destruction not only of thousands of civilian lives but also of a landscape that supported a way of life.

The UN-backed Commission for Historical Clarification (Comisión para el Esclarecimiento Histórico, CEH) established after the peace accord of 1996 estimated that 70 to 90 percent of Ixil communities that had existed in this region before the violence had been completely destroyed, and concluded that a genocide had taken place. The report confirms a death toll of about two thousand indigenous people killed by state security forces in the Ixil Territory during the Ríos Montt regime alone.[1]





1979 to 1986 vegetation change

Loss of vegetation cover

Increase of vegetation cover

Sources: Environmental Impact of Genocide in Guatemala: the Ixil Triangle and the Mexican Border (R. Schimmer)

0 5 Kilometers

The term "genocide" was coined after and in response to the holocaust of World War II to signify an ordered and industrialized form of mass killing.[2] Clause (c) of Article II in the 1948 Convention on the Prevention and Punishment of Genocide most closely captures the reality of the Ixil campaign of the 1980s by defining genocide as "deliberately inflicting on the group *conditions of life* calculated to bring about its physical destruction in whole or in part" (emphasis added).[3] Although the studies of the jurist Rafael Lemkin, the foremost figure responsible for developing the concept, included detailed references to colonial genocides,[4] the convention failed to specifically identify the "environment" as a means of deliberately inflicting destruction.

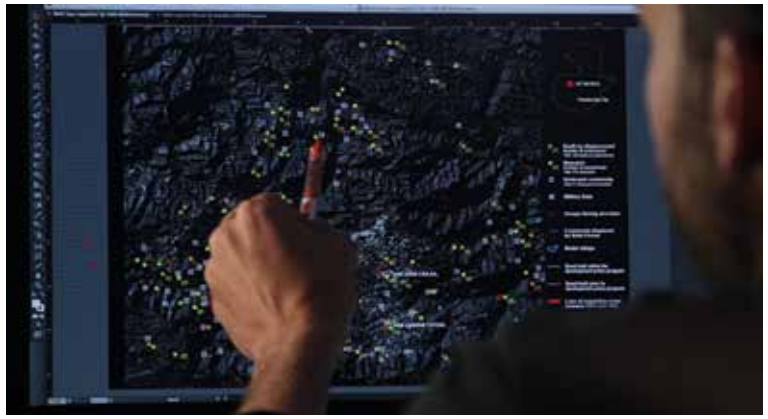


Fig. 3. Sites of massacres. Still from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2014).

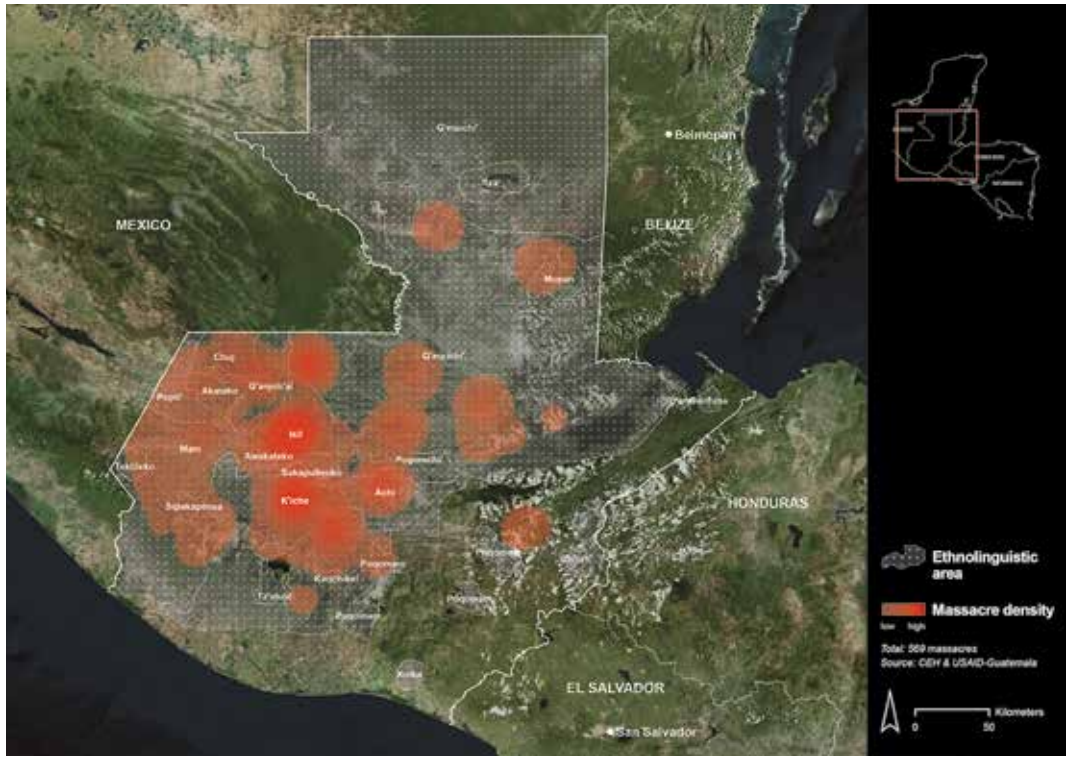


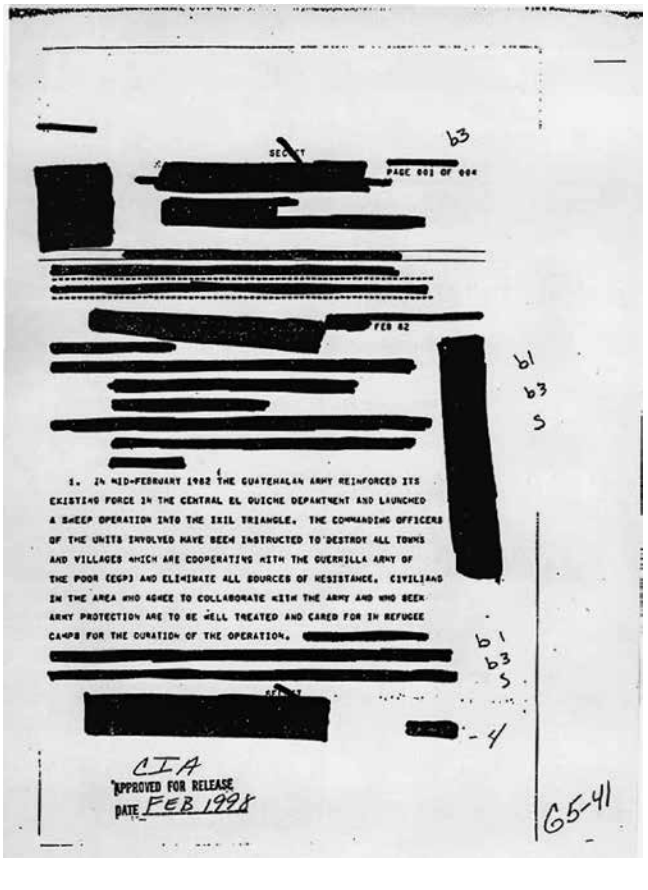
Fig. 4. Density of massacres registered by the CEH during the thirty-six years of civil war plotted over the ethnolinguistic map of Guatemala. The zone of greatest intensity overlaps with the ancestral territory of the Ixil Maya, in between the municipalities of Santa Maria Nebaj, San Juan Cotzal, and San Gaspar Chajul. In this region, as well as in the regions marked by denser massacres in the K'iche', Q'anjob'al, Chuj, and Achi territories, the CEH concluded that the set of violent actions perpetrated by state forces during the scorched earth offensives that took place between 1981 and 1983 amounted to "acts of genocide" committed against Mayan groups. Visualization: Forensic Architecture and SITU Research.

The genocide of the Ixil is a continuation of colonial practices that in the last five centuries led to the widespread extermination of indigenous peoples across the Americas. Historian Greg Grandin referred to the Guatemala campaign of the 1980s as the "the last colonial massacre," situating it as the culmination of a five-century-long process of colonization, land grab, and massacres suffered by the indigenous people in the Americas.[5] In colonial history direct killings and massacres were complemented by indirect modes of killing, including induced famine caused by the shrinking of native habitat and by the complete transformation of the natural/built environment and the ways of life that depend on it.

At the center of our analysis is the concept of "environmental violence," which we use in order to define the destruction and reconfiguration of the built and natural environment and, crucially, of the relation between them. Environmental violence kills by destroying the conditions that sustain life. It also destroys the conditions that enable *forms of life*. The former is an indirect form of killing that operates by the degrading of environmental conditions to affect the quality of land, water, hygiene, nutrition, and health care by restricting trade and access to life-sustaining infrastructure. The latter refers to modes of association, worship, agriculture, and economy. It is exercised by attempting to affect the political subjectivity of native people and give rise to populations conducive to state or colonial control.

In the Guatemalan highlands, in the time span covered by our report, "environmental violence" included the twin acts of destruction and construction. Both were manifestations of an attempt to reorganize the territory to suit the aims of military and state control.

In the early 1980s the government's counterinsurgency campaign saw the widespread deployment of what it called "scorched earth offensives." In the wake of mass slaughters, the military went on destroying hundreds of indigenous villages, agricultural fields, and livestock. Large-scale deforestations were also undertaken, purportedly for the exposure of militant hideouts. As the economy of the Ixil people was largely dependent on subsistence farming, and forests were a key source of energy in this remote region, deforestations and the destruction of crops effectively made large parts of territory uninhabitable.


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1. IN MID-FEBRUARY 1982 THE GUATEMALAN ARMY REINFORCED ITS EXISTING FORCE IN THE CENTRAL EL QUICHE DEPARTMENT AND LAUNCHED A SWEEP OPERATION INTO THE IXIL TRIANGLE. THE COMMANDING OFFICERS OF THE UNITS INVOLVED HAVE BEEN INSTRUCTED TO DESTROY ALL TOWNS AND VILLAGES WHICH ARE COOPERATING WITH THE GUERRILLA ARMY OF THE POOR (EGP) AND ELIMINATE ALL SOURCES OF RESISTANCE. CIVILIANS IN THE AREA WHO AGREE TO COLLABORATE WITH THE ARMY AND WHO SEEK ARMY PROTECTION ARE TO BE WELL TREATED AND CARED FOR IN REFUGEE CAMPS FOR THE DURATION OF THE OPERATION.

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Fig. 5. "Sweep offensives": In a secret cable dated February 1982 recently disclosed by the forensic archivist Kate Doyle, the CIA described the following scenario in respect to the military operations that were taking place in the Ixil Territory: "The commanding officers of the units involved have been instructed to destroy all towns and villages which are cooperating with the Guerrilla Army of the Poor (EGP) and eliminate all sources of resistance. Civilians in the area who agree to collaborate with the army and who seek army protection are to be well treated and cared for in refugee camps for the duration of the operation. [...] Since the operation began, several villages have been burned to the ground and a large number of guerrillas and collaborators have been killed. [...] When an army patrol meets resistance and takes fire from a town or village it is assumed that the entire town is hostile and it is subsequently destroyed. The army has found that most of the villages have been abandoned before the military forces arrive. An empty village is assumed to have been supporting the EGP, and it is destroyed. There are hundreds, possibly thousands, of refugees in the hills with no homes to return to." Source: National Security Archive, George Washington University, http://www2.gwu.edu/~nsarchiv/NSAEBB/NSAEBB425/.



Fig. 6. Model Village of Acul, ca. 1984. Source: Magazine of the Guatemalan Army, *Polos de Desarrolo y Servicios* (1984).

As a part of its counterinsurgency efforts, the military collected, deported, and resettled the survivors of the massacres in specially designed and militarized refugee camps. This was followed by a developmental phase, in which the military resettled the survivors in newly built "model villages," where programs of "food-for-work" and rural modernization were implemented. Together all these actions amounted to an attempt to radically transform the ways of life of the Ixil, to erode their political and cultural autonomy in order to bring them under the rule of the state.

The Investigation

Forensic Architecture's research was based on three periods of fieldwork in Guatemala undertaken in December 2011, November 2012, and March 2013. These included visits to the Ixil Territory, the search for and examination of sites of destroyed villages, and interviews with survivors. We also analyzed cartographic and archival material, previous legal cases brought in Guatemala against military leaders, and remote-sensing satellite data. Ultimately, the goal was to synthesize the disparate forms of data into a coherent report that reconstructs the chronological and spatial narrative of these events.

In Guatemala research and access were greatly helped by the Fundación de Antropología Forense de Guatemala (FAFG). The work was undertaken with and on behalf of the human rights organizations Centro para la Acción Legal en Derechos Humanos (CALDH) and Oficina de Derechos Humanos del Arzobispado de Guatemala (ODHAG).

Forensic Architecture's research on environmental violence was designed to complement other studies of the conflict. In order to demonstrate the multifaceted nature of environmental violence, our research was presented in the form of a web-based interactive cartography produced in collaboration with SITU Research in New York.[6] The platform is able to establish the spatial and temporal relation between otherwise separate pieces of evidence. Static elements such as locations of villages, military bases, and model villages were placed upon a terrain. Bracketed by the approximate start and end of the campaign, our representation of the terrain showed the transformation of the vegetation cover (due to deforestation and agricultural production). On top

of this gradually reconfigured terrain, we plotted the dynamic maneuvering of the military, sites of massacres and other atrocities, as well as lines of refugee displacement. These allowed us to cross-reference the otherwise disparate manifestations of the conflict.

The aim of this investigation was to support other evidentiary information presented in the case for genocide and crimes against humanity committed against the Ixil people in a series of trials taking place in Guatemala, including the retrial of former dictator Efraín Ríos Montt and other senior military staff in the National Court of Guatemala. Before the research was concluded, on May 10, 2013, Ríos Montt was convicted of genocide and crimes against humanity. The court found that under his regime the "Ixils were considered public enemies of the state and were also victims of racism, considered an inferior race," and sentenced Ríos Montt to eighty years in prison.[7] The constitutional court of Guatemala overturned the conviction just ten days later, on May 20, 2013, and forced a retrial.[8]

In November 2013, in an attempt to bypass the legal blockage in Guatemala itself, Guatemalan prosecutors presented a petition at the Inter-American Commission on Human Rights in Washington. Forensic Architecture's investigation was presented in this context, and was included as part of the evidence base prepared for the retrial of Ríos Montt, should it be resumed. It was also integrated into the evidence to be used in other trials of military leaders that are about to take place in the National Court of Guatemala.





Figs. 7, 8. Ixil survivors gather in the city of Nebaj for a workshop organized by local human rights NGOs before the trial of former dictator Efraín Ríos Montt, 2012. Photos: Forensic Architecture.

Historical Background

Between 1960 and 1996 Guatemala suffered one of the longest and most brutal of the dirty wars that ravaged Latin America in the late twentieth century. The UN-backed Commission for Historical Clarification (CEH) was established as a result of the peace negotiations that brought the war to an official close in 1996. The CEH report estimates the total number of dead and disappeared in the Guatemalan Civil War at more than two hundred thousand people. Guerrilla violence accounts for 3 percent of the human rights violations registered by the commission. The commission's mandate was restricted to reporting on human rights violations without identifying responsibility, and without power to prosecute. This changed in the following two decades as state prosecutors started bringing genocide cases to the national court.

The CEH report, published in 1999, concluded that the roots of the conflict were to be found within the highly exclusionary political and economic system that shaped the history of Guatemala, and the lack of channels for democratic participation in the transformation of this system. "It was like a vicious circle where social injustice caused protest and subsequently political instability, which always had only two responses: repression or military coup," the CEH stated. "Faced with movements proposing their economic, political, social or cultural charge, the State increasingly resorted to violence and terror to maintain social control."[9]



Fig. 9. Forensic archaeologists assemble and examine the skeletal remains of victims of the Guatemalan Civil War, Escuintla Forensic Laboratory (FAFG), Escuintla, Guatemala, 2011. Photo: Forensic Architecture.



Fig. 10. The DNA-identification room at Clyde Snow Laboratory ("Laboratorio Clyde Snow"), Guatemala City, November 2011. Photo: Forensic Architecture.

In the years following the US-backed coup of 1954 against democratically elected president Jacobo Árbenz, the conflict between an increasingly militarized state, growing popular opposition, and the gradual spreading of urban and rural insurgency escalated into a civil war. In urban areas and surrounding agricultural fields, forced disappearances and assassinations became the regime's most common method for dealing with trade unionists, teachers, students, and peasant leaders. In the countryside the military conducted systematic massacres of indigenous people.

During five centuries, as nonnative landowners took gradual control of the fertile valleys of Guatemala, indigenous Maya communities were pushed further up the mountain ranges. The uneven distribution of resources was one of the main causes of the conflict in Guatemala. Inequalities in land tenure led





Figs. 11, 12. Map identifying the location of unmarked graves—in which victims of the civil war were buried—uncovered by the Fundación de Antropología Forense de Guatemala (FAFG) at a cemetery in the city of Escuintla, south-central Guatemala. Stills from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.

to a system of governance characterized by the ongoing use of force to maintain domination.

Like other Maya peoples across the mountain ranges of Guatemala, the Ixil usually built their villages in small clearings within the otherwise dense cloud forests. Wooden houses with stone foundations were typically surrounded by small sustenance gardens. Small fields of beans and maize were scattered in the narrow valleys between the steep and heavily forested ranges; their borders were unclear and they were not fenced.

The forests were considered to be social commons and were maintained and cultivated together by families that shared the produce. Fruit trees were planted in among the existing foliage. They comprised a fundamental resource for local livelihood, and could not be thought of simply as a natural environment, but rather as an environment delicately entangled with human cultivation. Further, the cosmology of the Ixils conceived the mountains and the forest as sacred spaces—living entities possessing their own form of agency. This pattern of inhabitation protected by the steep mountains and connected only by poor roads allowed indigenous communities to maintain a semiautonomous life.

Starting in the early '70s, guerrilla organizations established their bases in the forests of the western highlands. The areas offered both good hideout possibilities and a constant supply of food and people from sympathizing villages. The semiautonomous life of the Ixils and their withdrawal from the state and its national identity made the military see these areas as posing a greater threat than was actually the case. The massacres of civilians and the environmental violence that transformed the area sought to destroy this last post of the Ixil Mayas in the western highlands of the Guatemala region, and to "close" the frontier.



Fig. 13. The Ixil Territory, 2013: a geography outside state control. Photo: Forensic Architecture.







Figs. 14–16. Exhumations of well ossuaries at La Verbena cemetery, Guatemala City, Guatemala. The black bags contain as yet unidentified human remains. During the last few decades, the team of the of the Fundación de Antropología Forense de Guatemala (Forensic Anthropology Foundation of Guatemala, FAFG) has been unearthing the huge ossuary wells in the municipal cemetery of Guatemala City, meticulously carrying out an investigation to identify the remains of missing persons amidst hundreds of unidentified bodies. In Guatemala, unidentified dead persons are buried in public cemeteries under the code "XX." After a few years, their bones are transferred from ordinary graves to large ossuaries, in this case very deep wells filled with thousands of bones. By analyzing the statistical registers of the municipal cemetery of Guatemala year by year, forensic anthropologist Fredy Pecerelli identified a peak in the number of "XX" buried in the early '80s. In order to conceal political murders, Guatemalan state forces dumped the bodies in the streets, leading to their burial as "XX." 45,000 forced disappearances occurred during the Guatemalan Civil War. Photos: Forensic Architecture.

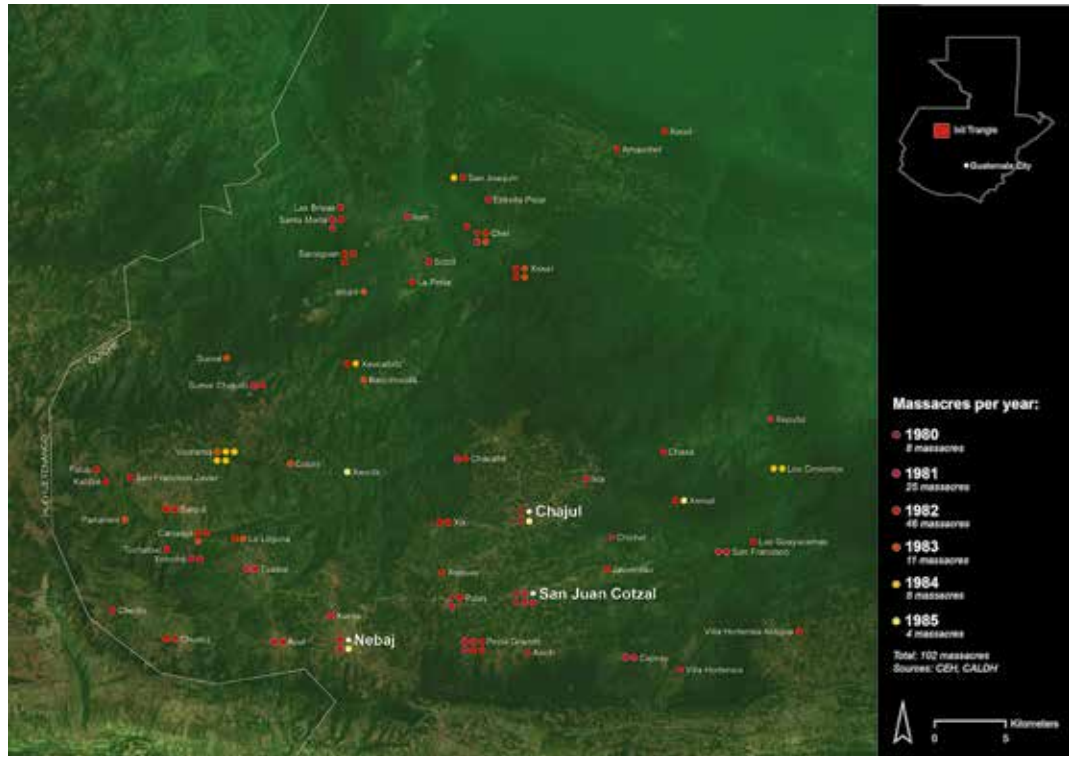
The military attack on the mountains took place against the background of a series of interconnected events: the Nicaraguan Revolution and the outbreak of the civil war in El Salvador in 1979, which intensified Cold War animosities; the support of the Reagan administration—implicitly and explicitly, financially or logistically—for "anticommunist actions" in Central America; and internal conflicts within the state and military forces in Guatemala.

In 1982, a military junta placed Ríos Montt in the presidency. Under the new government, the counterinsurgency strategies were expanded and the operational and technical capacity of the armed forces improved with diplomatic support and military aid in the form of arms, intelligence, and operational training by the US and Israel. The campaign was particularly intense in the area the military referred to as the "Ixil Triangle" between the cities of Santa Maria Nebaj, San Gaspar Cotzál, and San Juan Chajul in the department of El Quiché.

Some zones on military maps were marked in red; it was there that the military believed that the civilian population provided a potential base of support for the insurgents. It was in these areas that the military unleashed routine massacres of the civilian population and employed the tactics of "environmental violence" described above. In nearly all cases within the red zones, civilians were massacred and villages, fields, and forests were destroyed.[10]

During the years of 1982 and 1983, according to the CEH, approximately ninety villages were destroyed within the Ixil Territory. When villagers managed to recover and return, or as they tried to hide in the forests at the top of the hills, they were exposed to continuous military attacks. In some places, the CEH found that troops returned to the same spot three times to kill villagers and destroy houses and crops.[11]

A major component of the counterinsurgency strategy was the effort to depopulate the zones they saw as "toxic." Massacre survivors were initially relocated into "refugee reception centers" which were also places of forced labor located at the edges of major towns. From these places they were transferred to the so-called model villages, which resembled refugee camps and were similarly regimented. They were built in sites adjacent to, and sometimes on top of, destroyed villages deemed strategic spots. The presence of military bases nearby also meant that these concentration villages could be kept under close military control. The model villages were part of a larger process of territorial reorganization conducted by the armed forces. Airfields and helipads were carved out in remote forest areas, new roads were opened between model villages and towns, and their margins were cleared of forests.



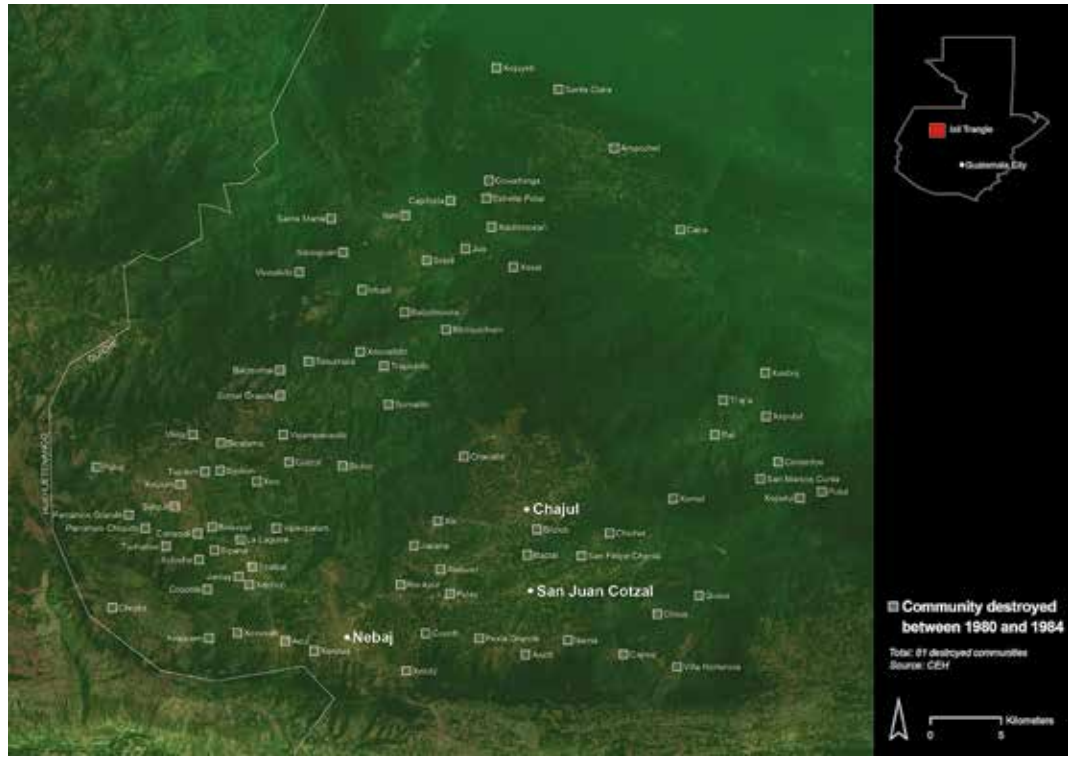


Fig. 17. (above) Location of massacres, 1980–1985. Visualization: Forensic Architecture and SITU Research.

Fig. 18. (below) Location of destroyed communities, 1980–1985. Visualization: Forensic Architecture and SITU Research.

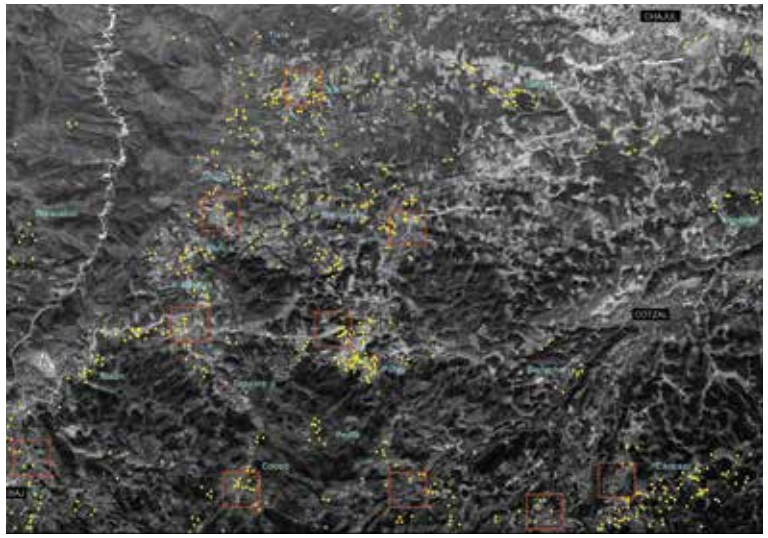


Fig. 19. Housing density in the "Ixil Triangle." Mayan villages had a dispersed spatial pattern. The houses were scattered in the valleys between the mountain slopes. In this image, the yellow dots mark the position of individual houses as of 1964. The red squares mark the location of new settlements and model villages. In a similar way to the strategy of "territorial reductions" used by Spanish colonizers, the "developmental" designs employed by the Guatemalan military sought to concentrate the Ixil population into urbanized zones, radically altering their modes of relating to their land. Visualization: Forensic Architecture and SITU Research.

The logic of environmental violence was both military-strategic and state-political. It aimed both to generate an area that would be easier for the military to dominate, and to incorporate the survivors into the expanding geometry of the state. A military publication explained that the aim of the attack on the Ixils was to "redeem the Ixil mentality" and integrate them into the "Guatemalan nation." [12] It was thus with the so-called *frijoles y fusiles*



Fig. 21. Aerial view of a part of the newly built model village of Acul. Source: Magazine of the Guatemalan Army, *Polos de Desarrolo y Servicios* (1984).

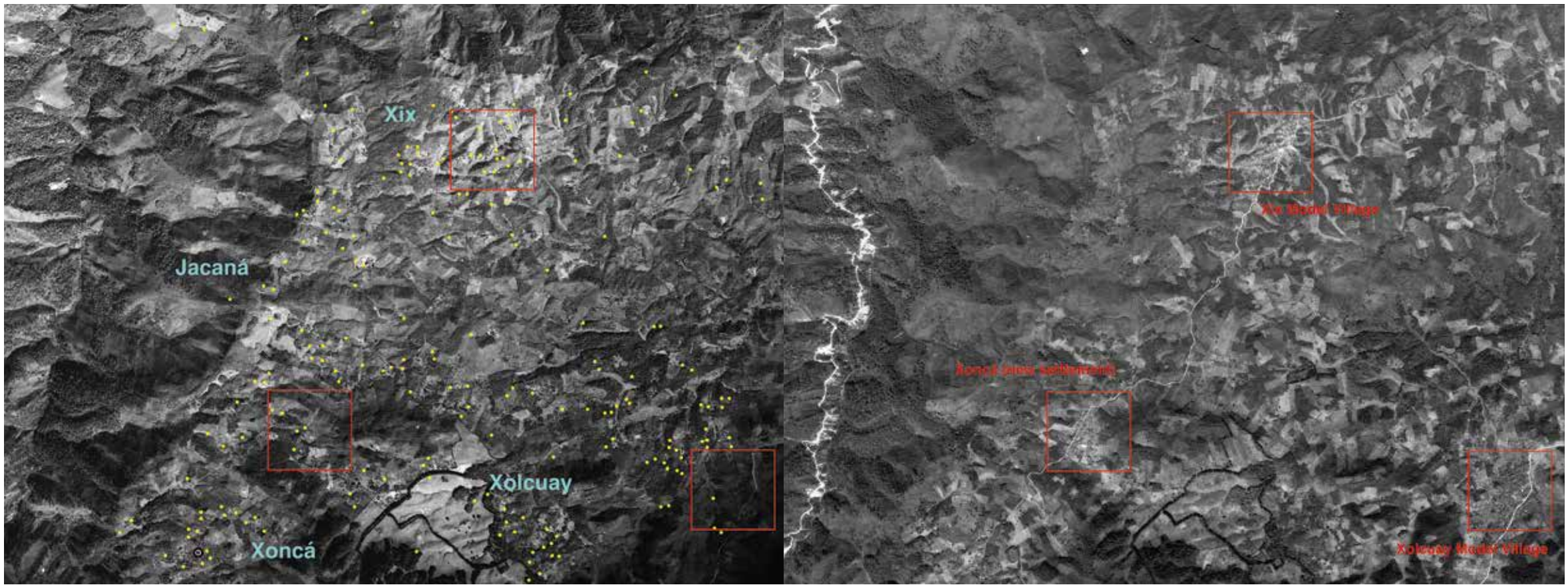


Fig. 20. Before (1964) and after (1991) aerial images of the region of the Xolcuay Village in the Ixil Triangle. In parallel with the violence and destruction of the villages, new road infrastructures and settlements were implemented as part of the military's "development strategy." Visualization: Forensic Architecture and SITU Research.

(beans and guns) program—combining warfare with the reorganization of the landscape, economy, and ways of life within these areas—that the Guatemalan military set out to break the political-natural bonds between communities and their land: in such a manner they aimed to destroy the basis of the existence of the Ixil people as a distinctive culture, forcing them to integrate into the national society and participate in its capitalist economy.

One of Mao's best-known aphorisms states, "The guerrilla must move amongst the people as a fish swims in the sea." Reversing this metaphor, the military in Guatemala claimed it wanted to "drain the river to catch the fish." As we traveled through the country learning the history of a brutal repression, cross-referencing and studying the data we obtained from various sources, we started to think that one should try to subject the metaphor to a further inversion. Between 1980 and 1983, the years in which the genocide took place, "catching the fish" became a pretext for "draining the water." Eliminating the insurgency was the justification the Guatemalan state gave for continuing, and in a sense completing, a five-century-long process of colonial violence, closing one of the last open frontiers on the continent and destroying a people and their way of life.

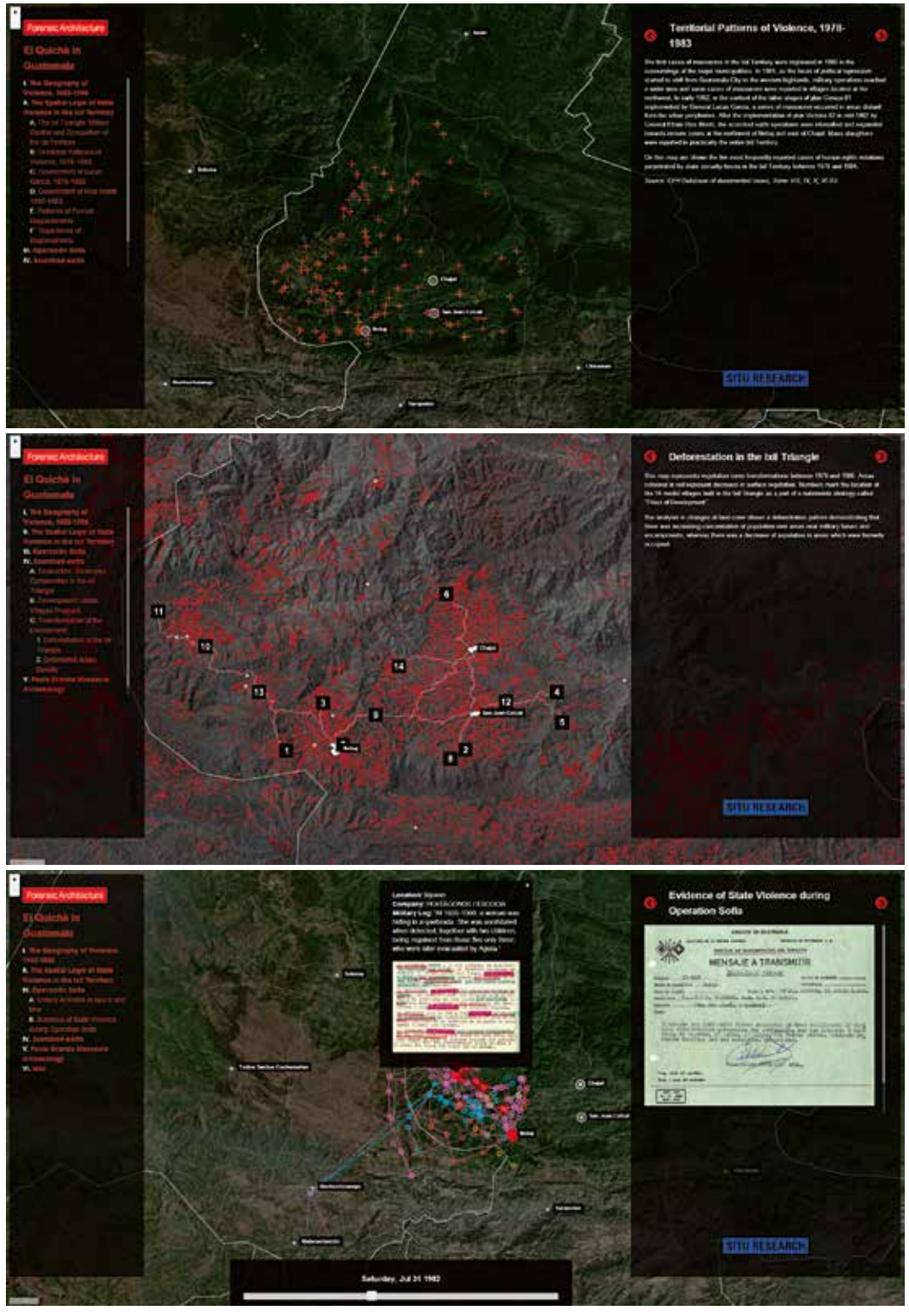
Methodology

Forensic Architecture's investigation aimed to demonstrate how the environmental violence in the Ixil Triangle became an important mode of military control, and one of the means by which genocide was perpetrated. As such, our research aimed to complement an understanding of genocide as the destruction of people with a spatial understanding—one that sees the effects of colonial genocide in the transformation of the built and natural environment and the relations between them.

We integrated new and existing data within an online time-based cartographic platform that covered the Ixil Triangle in the department of Quiché, covering the main events during the most violent period of the conflict (1979–1984). Particular attention was paid to the period of the Ríos Montt dictatorship (1982–1983) and specifically to the mapping of "Operation Sofia," a code name given to one of the military offensives that took place in mid-1982 in the region of the city of Nebaj.

Information about military movements, sites of massacre, the destruction of villages, and trajectories of displacement were aggregated and geographically located within the platform.

The platform is the cartographic tool used to locate evidence in time and space and also locate pieces of evidence in relation to each other, presenting thus the spatial matrix of genocide and control.



Figs. 22–24. Online platform of environmental violence in the Ixil region. Visualizations and platform: Forensic Architecture and SITU Research. Available at http://guatemala.situplatform.com/.

One of the main methodologies involved physically tracking the forest. In attempting to identify the larger areas within which building remains are located, we learned from our hosts to follow the plants. The density and distribution of plant types is an archaeological resource which indexes traces of human presence. Coming across fruit trees like avocado, papaya, and peach, or encountering wild maize, signals the possible presence of house and village sites.

The cloud forest accelerated the disintegration of all the organic materials composing the destroyed and burned homes. After thirty years all that remained were small elevated earthworks, their stone foundations often overgrown with shrubs. Sometimes we had to probe the ground to identify the harder surfaces below that could designate the foundations. When we found such foundations we had to clear away the plants with a machete, before photographing and sometimes measuring the remains.

After identifying a group of homes, the archaeologists of the FAFG would look for the graves. Following a massacre, so our guides in the FAFG told us, the guerrillas or surviving members of families would return to hastily bury the dead while following some of the traditional burial rites and customs.

Most of the forensic archaeologists undertaking exhumations since the end of the civil war were trained in the archaeology of the pre-Hispanic Mayan civilization. Excavating around one of the military bases in these remote zones, the material remains of modern state terror were found near fragments of the pre-Columbian past, pointing not only to the area's continuous inhabitation over an extended period, but to a genocidal continuum of colonial history.



Fig. 25. Taken over by wild grass, this small forest-cleared plot of land was formerly occupied by a wooden house. On the left side of the image an avocado tree can be identified. Village of Xolcuay, Ixil Territory, 2013. Photo: Forensic Architecture.

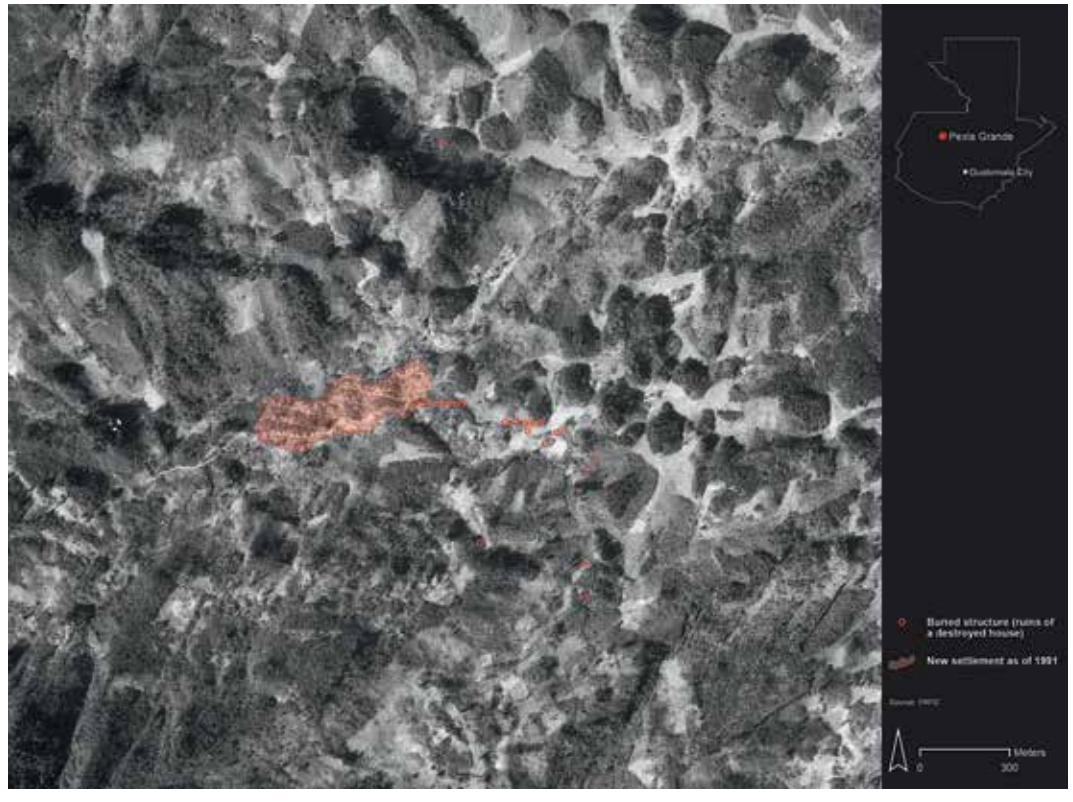


Fig. 26. 1991 aerial photograph of the village of Pexla Grande. The red dots mark destroyed structures documented and visited by Forensic Architecture in December 2011. At the center, the denser area within the red shape indicates a new settlement built by the military in the early 1980s. Visualization: Forensic Architecture and SITU Research.



Figs. 27–30. Stills from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.

Fig. 31. A stone from a house destroyed and burned down during the massacre of the village of Pexla Grande in 1982. Photo: Forensic Architecture, 2011.



Fig. 32. The foundations of a house overgrown by vegetation near the village of Pexla Grande. Photo: Forensic Architecture, 2011.





Fig. 33. Looking for building foundations under a layer of vegetation near the village of Pexla Grande. Photo: Forensic Architecture, 2011.



Fig. 34. Excavation of graves suspected of containing victims of state executions in the cemetery of Escuintla, Escuintla, Guatemala. Photo: Forensic Architecture, 2011.



Fig. 35. Fredy Peccerelli, Director of the Guatemalan Forensic Anthropology Foundation (FAFG), examines a skull of a victim of the civil war in Guatemala. Still from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.



Fig. 36. Archaeologist Claudia Rivera presenting a pre-Colombian piece of pottery (in her left hand) and human remains from the era of the Guatemal Civil War (in her right hand) in order to demonstrate the entanglement of ancient archaeology and forensic anthropology. Exhumed sites of massacres sometimes contain remnants of the ancient culture of the Maya. Still from Paulo Tavares and Eyal Weizman, *The Mineral Geology of Genocide* (2012), 47 min.

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Studying the transformation of the built and natural environment, we have had to cross-reference the results of ground investigation with satellite data. In relation to the latter we have followed a methodology developed by the Genocide Studies Program of Yale University, which employed Normalized Difference Vegetation Index (NDVI) analysis to uncover the traces of genocide.[13] NDVI is a graphical indicator that is used to visualize and help interpret transformations in vegetation cover. When two or more satellite images are superimposed, the NDVI data can demonstrate changes in the natural environment between the dates on which each image was captured. Each pixel on the image has a color on a scale that indicates whether the area within the pixel lost or gained vegetation cover. In this way, changing patterns of land use over time can be rendered visible.

To assess vegetation cover change in the Ixil Triangle area, we used two satellite images. The "before" image was taken by NASA's earth observation satellite Landsat 3 on February 6, 1979, (at a resolution of sixty meters per pixel) and the "after" image was captured by the Landsat 5 satellite on March 13, 1986 (at thirty meters per pixel). The capture dates bracketed the period of the intensification of the counterinsurgency campaign. They were chosen because both were taken at roughly the same time of year, which offsets variation due to seasonal change.

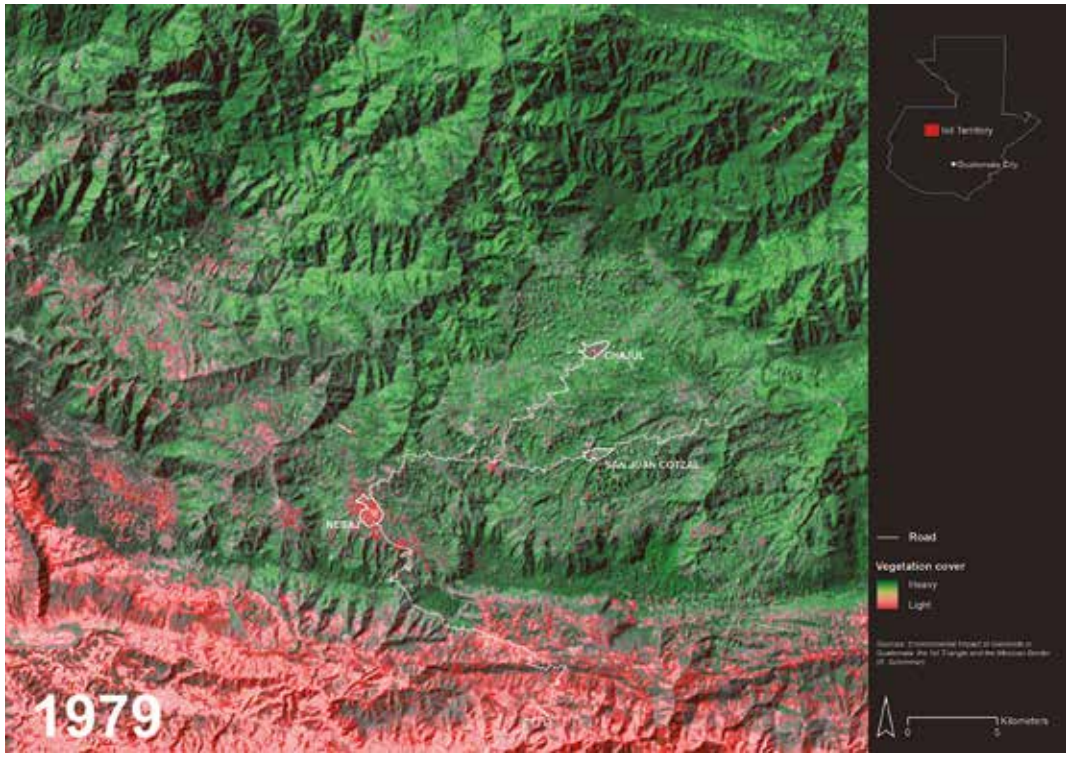
When calculating the difference between the 1979 and 1986 indices we noticed large territories, around the Ixil area of inhabitation and the routes connecting them, which lost considerable amounts of vegetation (red) cover in this period. In other areas, mainly scattered around the valleys of remote mountains, the opposite pattern became visible: gains (green) in vegetation cover probably signaled that these were areas formerly occupied by farmland, now being overtaken by the wild.

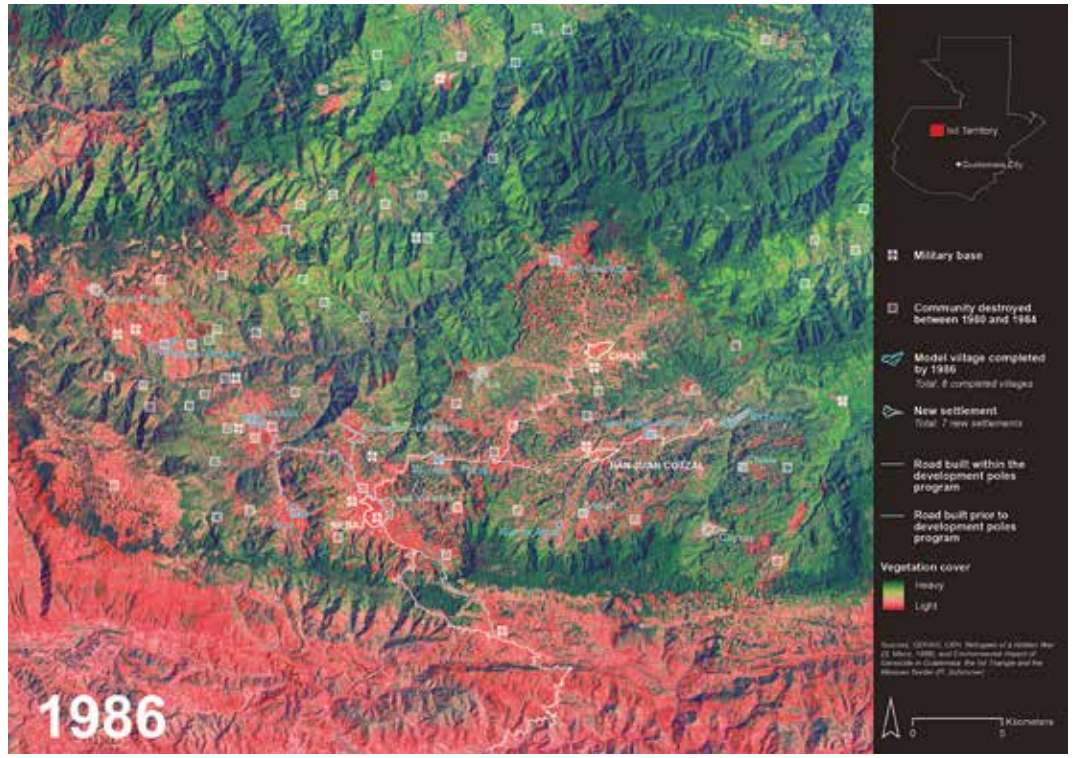
We then overlaid the NDVI analysis with another set of data we gathered from the CEH database and research material collected by the NGOs FAFG, CALDH, and ODAGH. These included the geographical positions of the villages that were destroyed during the scorched earth massacres, sites of human rights violations, the positions of military bases, and the locations of the model villages and new roads. Next, we overlaid on the NDVI other data that we obtained in interviews, in archival research, from our field trip and from the "the war logs" of Operation Sofia and the forensic archaeologists' reports.

Cross-referencing the different types of data and comparing them with the sample ground survey we had undertaken, we found a high degree of correlations between otherwise disparate phenomena. The areas marked on the NDVI as deforested overlap with two entangled interventions: (1) places where massacres took place and villages were destroyed; and (2) places where "model villages" and "military bases" were constructed, and the main roads connecting them. When overlaying on the NDVI data the paths of the dislocation of the indigenous population, we could also observe that it was largely from areas suffering extreme vegetation loss that survivors arrived in the concentration areas and to the model villages. We could thus confidently assume that the transformation of the "natural" (the forest), the "built" (villages and fields), and military violence went hand in hand.

Postscript: Field Causality

The laws of war (of International Humanitarian Law, IHL) and of human rights produce figurations. They identify both victims and perpetrators and extract them from the complex milieux in which they are embedded. This means that as a tool for comprehending and dealing with violent struggles these legal





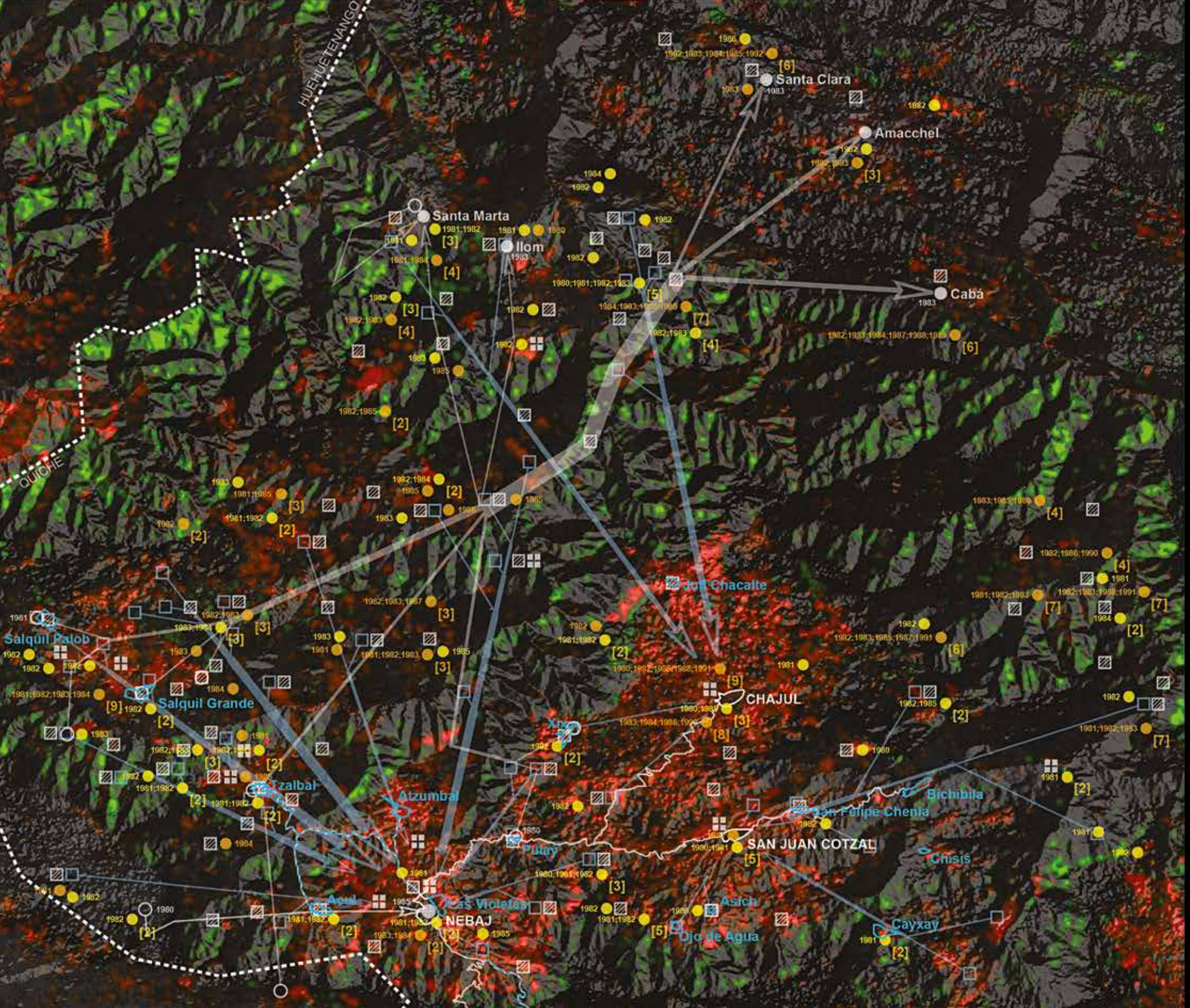
Figs. 37, 38. Normalized Difference Vegetation Index (NDVI) analysis of the Ixil Territory for 1979 and 1986, respectively. Green indicates heavy vegetation; orange indicates medium vegetation; red indicates low levels of vegetation cover. Observing the transformations in land-cover patterns, two trends are noticeable: deforestation in the zones surrounding the major cities of the Ixil Triangle; and an increase in vegetation cover in the northern periphery of the Triangle, possibly signaling the former existence of agricultural fields cultivated by communities whose members were either killed or displaced, and which after being burned were gradually taken over by the wild. Visualizations: Forensic Architecture and SITU Research.

norms generate an effect comparable to the multi-stable images used in gestalt psychology, where it is generally only possible to observe either figure or ground—in this case, humans or environment—but not both simultaneously.

Our investigation attempted to generate an entangled form of analysis that goes beyond this difficulty. We studied the environment as neither the background nor the location of conflict, but rather as an entity in constant interaction with conflict. As long as people believe that the existing environment (mountain and forests, for example) conditions the way conflicts unfold, the environment will bear the brunt of violence and become the means by which resistance is put down.

Our work thus comes to complement the knowledge gathered by the forensic anthropological research undertaken by the FAFG and other groups in the area of the Ixil Territory. After digging out mass and individual graves these groups undertook a process of identification of the bodies by means of DNA analysis, in order to collect evidence both for trials and in order to allow the bodies to be returned to their families for reburial. In both these contexts—providing legal evidence and giving dignity to the dead—this work proved extremely valuable. Most of the bodies exhumed in the Ixil Territory recorded the hard violence of physical trauma—machete wounds, burn marks, or bullet holes.

However, the prevalence of this type of work begs the question of whether this process of figuration also masked the extent and nature of the environmental violence and of the indirect mortalities it caused. One of the questions raised by a consideration of indirect excess mortality is what constitutes an act of killing? Are killings simply the direct, linear relation between perpetrator and victim, the figures at either end of a firing gun—or could secondary consequences of a military campaign also be understood as killing? For example, there were different causes of mortality in the Ixil area in the early 1980s. Survivors escaping from the military to live in the mountains were subjugated to extremely harsh conditions that led many to die of hunger, disease, and hyperthermia. In the field of epidemiology, the causes of these deaths are referred to as “indirect mortality”—and are calculated by the statistical excess of mortality within a population at a particular time. How can we understand and assign political responsibility for the destruction of life that resulted from the destruction of the conditions that support it?


HUEHUETENANGO
QUICHE
Santa Clara
1983
Amacchel
Santa Marta
1981;1982
[3]
Ilom
1983
[4]
[5]
Cabá
1983
[7]
[6]
[2]
Salquil Ralob
Salquil Grande
Zalbal
Atzumbal
Pilay
Las Violetas
NEBAJ
Aguil
Juil Chacalte
CHAJUL
Xix
SAN JUAN COTZAL
San Felipe Chenla
Bichibila
Chisis
Asich
Ojo de Agua
Cayxay
Ixil Territory
Guatemala City
Death by displacement
Number of occurrences
Total: 126 deaths by displacement
Massacre
Number of occurrences
Total: 101 massacres
Destroyed community
Total: 81 destroyed communities
Military base
Groups fleeing atrocities
Community displaced by State Forces
Model village
Road built within the development poles program
Road built prior to development poles program
Loss of vegetation cover between 1979 and 1986
Increase of vegetation cover between 1979 and 1986
Sources: CEH, CALDH, ODHAG, Refugees of a Hidden War (B. Manz, 1988), and Environmental Impact of Genocide in Guatemala: the Ixil Triangle and the Mexican Border (R. Schimmer)
0
5
Kilometers

Although the CEH database includes victims of killings caused by the extremely harsh environmental conditions to which the civilian population was subjected as a result of the scorched earth offensives, no analysis of such effects was undertaken in detail, and the precise number of victims of environmental violence can only be estimated within the overall calculation of the total of the war's dead. Patrick Ball, the scientist responsible for producing the most comprehensive statistical analysis of the death toll caused by military forces during the Guatemalan Civil War, considers this number an open question awaiting further examination.[14] Because the causes of such deaths are harder to identify and quantify, it is harder to attach legal responsibility to them.

Limiting the scope of inquiry to questions of direct casualties neglects some of the most crucial destructive effects of conflict—deforestation, population transfer and concentration, land use and economic transformation—and limits our historical understanding. Indirect excess mortality, for example in the form seen here where entire peoples succumb to disease and malnutrition as the result of the violent transformation of their environment, is the signature of colonial genocides.

A more complete political account of conflict would demand an understanding of what we would like to call "field causality"—aggregate causes that apply, like a force field, from all directions, involving various agencies and modes of physical transformation to shape a specific reality. It should be acknowledged that field causality can become a perpetrator's line of defense. Direct causality is rightly invoked to establish the principle of mens rea—the "guilty mind" that is generally required to establish intent, and thus criminal responsibility. Only by establishing what was known and intended by the person who took decisions that produced culpable effects is it possible to establish personal responsibility and liability in genocide trials.

But personal responsibility, and the mechanisms established to determine and address it, must be complemented by an understanding of the slower—though no less lethal—consequences of environmental violence. The presentation of the "field causalities" of "environmental violence" would eventually demand other forms of justice, not only the indictment of specific individuals, but rather a search for ways to transform the lethal force fields on which the state of Guatemala still rests, before and after the end of the civil war.

Fig. 39. (previous pages) This composite map demonstrates how the pattern of massacres corresponds to transformations in the natural and built environments: deforestation, destruction of Ixil villages, construction of model villages and roads in the Ixil area between 1979 and 1986. These are plotted against a backdrop of Normalized Difference Vegetation Index (NDVI) analysis of the transformation of the Ixil region, 1979–86. Visualization: Forensic Architecture and SITU Research.

• The data mapped was extracted from the extensive database compiled by the CEH, which is publicly available at http://shr.aaas.org/guatemala/ceh/mds, and also from cases documented by the human rights organizations Centre for Legal Action on Human Rights (CALDH) and Human Rights Office of the Archbishopric of Guatemala (ODAGH).

• Military operations referred to "Operación Sofia" were mapped from the original document which can be found at the website of the project National Security Archive available at http://www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB297/index.htm.

• The study of spatial/ecological transformations in the Ixil Territory was based on remote sensing technology analysis and field research. For the identification of temporal vegetation-cover change we based our map on a previous research produced by the Genocide Studies Program of Yale University, available at http://www.yale.edu/gsp/guatemala/index.html.

1 Human rights statistician Patrick Ball estimated the number of fatalities to be between 1,996 and 2,325. Rodrigo Baires Quezada, Oswaldo J. Hernández, and Patrick Ball, "Por qué los datos casan con la hipótesis de que hubo genocidio," *Plaza Pública*, April 23, 2013.

2 See Raphael Lemkin, *Axis Rule in Occupied Europe: Analysis, Proposals for Redress* (Washington, DC: Carnegie Endowment for International Peace, 1944), 79–95. Available at http://www.preventgenocide.org/lemkin/AxisRule1944-2.htm.

3 *Convention on the Prevention and Punishment of the Crime of Genocide. Adopted by the General Assembly of the United Nations on 9 December 1948*, http://treaties.un.org/doc/Publication/UNTS/Volume%2078/volume-78-I-1021-English.pdf.

4 A. Dirk Moses, "Raphael Limkin, Culture, and the Concept of Genocide," in *The Oxford Handbook of Genocide Studies*, eds. Donald Bloxham and A. Dirk Moses (Oxford: Oxford University Press, 2010), 19–41.

5 See Greg Gandin, *The Last Colonial Massacre: Latin America in the Cold War* (Chicago: University of Chicago Press, 2011).

6 See http://guatemala.situplatform.com/.

7 "Former Guatemalan dictator Efrain Rios Montt sentenced to 80 years for genocide," *Press TV*, May 11, 2013, http://presstv.com/detail/2013/05/11/302857/exdictator-guatemalas-guilty-of-genocide/.

8 According to Amnesty International, the retrial is not likely to take place until 2015. See "Guatemala: Ríos Montt Trial Delay is a Letdown to Genocide Victims," *Amnesty International News*, November 6, 2013, http://www.amnesty.org/en/news/guatemala-r-os-montt-trial-delay-letdown-genocide-victims-2013-11-06.

9 Commission for Historical Clarification (Comisión para el Esclarecimiento Histórico, CEH), *Report: Guatemala; Memoria del silencio*. Tz'inil Na'tab'al June 1999, vol. 5, 22–23; authors' translation.

10 Of the total cases of massacres recorded by the CEH, only three were not followed by the destruction of land and houses. CEH, *Report: Guatemala; Memoria del silencio*, vol. 3, 345.

11 Ibid., 344–45.

12 Ejército de Guatemala, "Apreciación de asuntos civiles (G-5) para el area Ixil" / "Una Solución a la operación Ixil. Plan de AACC - Operación Ixil," *Revista Militar* (September–December 1982): 37.

13 See Russell Schimmer, "Environmental Impact of Genocide in Guatemala: The Ixil Triangle and the Mexican Border," GSP Working Paper no. 31, Yale University Genocide Studies Program, http://www.yale.edu/gsp/guatemala/index.html, last accessed November 2013.

14 See Baires Quezada, Hernández, and Ball, "Por qué los datos casan con la hipótesis de que hubo genocidio."

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Nonhuman Rights

Paulo Tavares

> Our culture abhors the world.
> — Michel Serres[1]

While the crew of technicians worked through the last hours of a day-long operation to plug the drilling hole, a mass of hydrocarbons leaked into the bottom of the bore well, some thirteen thousand feet below the sea floor. Undetected by the safety sensors, the material rapidly flowed upwards inside the giant tubular structure. As it rose closer to the surface, where pressure is much lower, gases present in the mixture quickly expanded in volume, pushing drilling fluids within the riser further above. This sudden influx led to the complete deregulation of the pressure balance within the well, generating a pump-effect that sucked large quantities of high-pressure oil and gases from the reservoir deep down in the earth's crust. Emergency alarms and valves designed to shut down the pipes failed to function. At 21:47 on April 20, 2010, an uncontrolled stream of mud—a mixture of seawater, oil, gas, and other components—burst over the deck of the Deepwater Horizon floating rig in the Gulf of Mexico. Two minutes later, the hydrocarbons inevitably ignited, causing the first of a sequence of massive explosions.[2]



Fig. 1. Oil spill zone, July 2010. Source: Corbis.

For the next thirty-six hours, an army of ships tried in vain to halt the fire, until the platform finally collapsed and sank five thousand feet below the surface of the ocean. Then the real ecological catastrophe began. Because the marine riser failed to disconnect from the rig, the tubular structure fractured completely while Deepwater Horizon was sinking, leaving a large opening to the giant Macondo oil field in the seabed. A series of systems were engineered to try to stop the spill, all of which either totally failed or were ineffective. Meanwhile, as large-scale contamination loomed from the deep sea and forecasts of a severe hurricane season prompted concerns of further ecological chaos in the gulf, response operations escalated to war-like proportions.[3] Only six months later, after the installation of a cement cap, was the well considered permanently sealed. One year on, local testimonies and international media reports revealed that oil was still leaking under the ocean.[4]

By any comparison, the "BP oil spill" was one of the largest offshore oil disasters in history and the gravest ever registered within US jurisdictional

waters. The official (and highly controversial) quantification of the amount of oil that was discharged into the gulf amounts to a volume more than six times greater than the quantity discharged into the ocean by the *Exxon Valdez* spill in 1989.[5] Apart from the damage caused to coastal communities, scientists paint a grim ecological picture of planetary proportions. Being one of the most important migration corridors in the world, the Gulf of Mexico is the feeding ground for multiple species of fish, seabirds, and marine mammals. The spreading of toxic fluids and gases may significantly alter the rates of mortality of sessile plants and damage coral-reef habitats, thus severely affecting the food chain and impacting the population size of certain species of fish. Furthermore, scientific analysis of real-time satellite data concluded that there is enough evidence to show that the biochemical and biophysical effects of the oil spill led to the break-up of a crucial ocean stream named the Loop Current, which could possibly trigger chain reactions that will alter the thermoregulation functions of the Gulf of Mexico and thus affect the global climate.[6]

"To invent the sailing ship or steamer is to invent the shipwreck," wrote architect Paul Virilio with respect to the philosophical dimensions of technological catastrophes. "It follows that fighting against the damage done by Progress above all means uncovering the truth of our success in this accidental revelation."[7] Perhaps more relevant than all the other historical records broken by the BP oil spill was the fact that it inaugurated a previously unknown form of disaster, for which the best available means of environmental defense were completely inadequate. Up until this point, the science of governing oil spills was informed by what had been learned with the *Exxon Valdez* oil spill on March 24, 1989, in the Gulf of Alaska, a tank vessel disaster. The technologies of containment that were developed were thus prepared only to deal with surface-based leaks, battling waves of crude in order to protect shorelines.[8] The ultra-deep water spill in the Gulf of Mexico, however, exposed a totally different accidental chemistry and physics. It demonstrated that as the frontiers of resource extraction are expanded towards formerly unreachable geological depths and land surfaces of the earth, the nature of catastrophes to come will be completely other than those already recorded, from the Gulf of Mexico to Fukushima—far more violent and devastating than before.

Through examining the disastrous blowout at the Macondo well and the multiple reactions that ensued, what becomes apparent is that this event challenged not only the currently available knowledge and technologies of environmental remediation, but also the means of representation that render socio-ecological catastrophes culturally and politically meaningful. The unprecedented scope of the disaster, and the extraordinary qualitative dimensions of the ecological damage it unleashed, exposed the limits of a certain regime of visibility that shape our perceptions and relations to what we have named "nature." By looking to a crucial space of mediation through which our conceptions of the natural world are constructed (the courts, codes, and protocols of law), probing how nature appears within legal forums and texts, and questioning the ways by which violence against forms of life other than human are legally moderated, this text contends that, ultimately, the fundamental conflict is not so much related to the question of whether the existing legal provisions can ensure proper protection to ecosystems, but rather to the very concept of nature itself that is being inscribed by law. As such, I conclude by speculating on the idea that power is concerned as much with relations of cultural hegemony as with those of "natural hegemony," insofar as power seeks to impose a particular view of what nature stands for in such a manner that it appears as a universal condition, thus reducing the diversity of forms of entanglement between society and environment to an univocally utilitarian perspective. The hidden laws and politics that constituted this natural order have functioned and continue to function as a subtle yet powerful instrument of domination of both humans and nonhumans, and, crucially, of the relations established between them.

In Defense of the Rights of the Sea

What was even more troubling in the case of the BP oil spill was that the unforeseeable socio-ecological impact it unleashed was not only a consequence of the spill itself, but in large part the result of the technology that was used to contain it and to "clean up" the sea. Besides setting a record for the quantity of discharged oil, the Macondo well blowout became a landmark event in the history of catastrophes because BP's response strategy released an incalculable volume of dispersant agents into the ocean. Corexit—the carcinogenic chemical compound deployed as a dispersant—is manufactured under the monopoly of a US-based company named Nalco whose managerial board includes executives from powerful petroleum multinationals such as Exxon and, not surprisingly, BP.[9] Designed to break up oil into tiny droplets and thus avoid the formation of large waves of crude, dispersants help to reduce impact on shorelines. At the same time, their toxic chemistry also has the capacity to severely damage and even kill various forms of marine life. As if we were watching another version of the chemical attacks deployed against the sea of tropical forests of Indochina during the Vietnam War, aircrafts such as the US Air Force C-130 sprayed millions of liters of Corexit over the Gulf of Mexico and millions of liters more were directly injected deep into the ocean.[10]

"Never before in human history," wrote journalist Julia Whitty after visiting the disaster zone while clean-up operations were taking place, "has the vast food web of the ocean—rooted in the dark, and flowering at the surface—come under so many assaults from below, above, and within the water column: marine warfare masquerading as a cleanup."[11] It is almost as if we were trapped within a vicious, deadly loop: the same means of inflicting

violence against nature deployed as instruments for its healing, the industry of production and destruction converging into a global conveyor belt lubricated by heavy crude and its petrochemical derivatives. While economists have long built upon Marx's original insights to demonstrate how capital finds in devastation its most energizing forces, nothing can be compared to the geographical scope achieved by the logic of "creative destruction" today, which now operates at the scale of Earth's climate.

"What action could we take?," activist and writer Esperanza Martínez asked herself when news about the Deepwater Horizon catastrophe started leaking through the media. "What could function as a pedagogic instrument to bring public awareness to the limits imposed by extreme disasters such as the BP oil spill?"[12] During an interview conducted in Quito in late 2011, Martínez, member of NGO Acción Ecológica and Oilwatch representative in Ecuador, explained to me why the response came in the somewhat unusual form of a lawsuit filed in the Constitutional Court of Ecuador, a country which, in principle, had little if any direct relation to the devastation that swept through the currents of the Gulf of Mexico. Signed by the main



Fig. 2. "Safe Seas": A US Air Force C-130H aircraft sprays water-based dispersant simulators over the Pacific Ocean offshore San Francisco as part of the program Safe Seas Oil Spill Response Exercise, August 9, 2006. Photograph by Capt. Brent Davis. Source: US Air Force.

indigenous organizations of Ecuador together with an international coalition of NGOs and activists, the preamble of the lawsuit set the dispute in the following terms:

> We hereby submit, in *defense of the rights of the sea*—understood as an integral part of nature which the Ecuadorian Constitution of 2008 recognizes as a subject of rights and which we recognize as a giver of life of which we form part—the present lawsuit filed under the *principle of universal jurisdiction* against the transnational corporation British Petroleum PLC, headquartered in the United Kingdom, as the responsible party for the environmental disaster that struck the Gulf of Mexico on 20 April 2010.[13]

Legal advocacy is of course not a novel strategy in responding to ecological catastrophes. Most notably after the publication in 1962 of *Silent Spring*, Rachel Carson's seminal indictment of chemical pollutants, the alliance between the natural and legal sciences was firmly consolidated as lawyers and ecologists increasingly joined efforts to take action on behalf of the environment. The lawsuit filed against BP in Ecuador draws from this historical tradition, but at the same time projects it anew, appropriating the classic tools of environmental advocacy to expose its own limitations, searching for means to expand the political force of what has been called "environmental justice." More than an action with law as its instrument, the lawsuit was an intervention within the very frames of law itself, which sought to make visible how the existing legal order inevitably legitimizes the ecological violence it should help to restrain.

Although rigorously crafted to respond to juridical protocols, the lawsuit subverted the traditional grammar of legal demands by framing the dispute as a political-cultural conflict of broader implications. The plaintiffs justified the indictment through a forceful criticism of the "model of growth, overexploitation and plunder" of the global fossil-fuel industry, the "development philosophy antagonistic to nature" upon which that model is based, and the international legal system that regulates it.[14] Besides the clarity with which the lawsuit exposed the hidden economic, political, and juridical mechanisms that lie behind large-scale ecological disasters such as the BP oil spill, what made this legal text a rather exceptional intervention within the larger context of environmental politics was the position that the environment occupies within it. Similarly to traditional class suits, the plaintiffs emphasized the necessity to redress the harm caused to local communities but, in a radically different manner, they situated the demand beyond the arena of human rights and socioeconomic rights, advocating not on behalf of the interests of the users of the Gulf of Mexico but "in *defense of the rights of the sea*." Nature thus appears as the primary subject whose rights had been violated rather than only the medium through which the rights of persons were impaired.

From this juridical gesture unfolded a series of pragmatic consequences that challenged the then current mechanisms of restorative justice with regard to the environment—the most significant being that, while acting as the legal guardians of the rights of nature, the plaintiffs rejected any form of economic reparation, penalty, or award. Instead, following a pioneer initiative launched in Ecuador to keep large reserves of crude in Amazonia *bajo tierra*, they demanded that BP commit to leaving underground the equivalent amount of oil that was discharged into the ocean. There is a dissident conception of environmental damage and compensation operating here which, as opposed to traditional juridical approaches, aims to respond to forms of injury and rights violations that extrapolate the geography of the (collective) human body and the temporality of social history, thus requiring a legal framework that corresponds to the scaleless spatiality of nature and the deep time of the geological.

Starting from the understanding that nature itself should be considered as a subject entitled to rights, the reinstatement of the ecology of the Gulf of Mexico is considered imperative yet not sufficient. By displacing the human-centric foundations of modern/colonial law, the lawsuit projects a legal concept of environment that cannot be bound to regional ecological dynamics or the artificial lines that demarcate national jurisdictions. Therefore leaving oil in the ground, the plaintiffs argued, could be a more just way of compensating nature for the impact that the BP oil spill had on global regulatory thermodynamic cycles. Conceived as a "pedagogic instrument," as Esperanza Martínez described it, the lawsuit's central message dwelled within the field of the biopolitical, situating environmental crimes as a form of violence against life itself, but only insofar as the inscription of life into the realm of politics is not limited to the philosophical tenets of humanism. Rather, biopolitics is considered to be contingent upon the multi-species agency that makes natural history, before and beyond the human, against state-led forms of territorialization.

There have been several attempts at defining provisions for including severe environmental damage alongside other forms of international crime, such as, for example, establishing "ecocide" as a crime against peace. However, there exists no international or national court that recognizes the rights of nature apart from courts in Ecuador, under the constitutional provisions established in 2008, and more recently in Bolivia, under the Law of the Rights of Mother Earth, passed in 2010. Therefore, the lawsuit against BP was filed on the basis of the principle of *universal jurisdiction*, a doctrine of international law which contends that a state can claim jurisdiction over crimes committed outside its territorial boundaries, regardless of whether those crimes were committed against its own citizens, in the context of certain types of international crime such as genocide and crimes against humanity. Because those types of crimes are considered severe attacks on the dignity and consciousness of humanity, the means of legislating them are not ascribed to domestic courts, but belong to a conceptual "universal court" that can potentially be activated anywhere around the globe. By invoking the principle of universal jurisdiction, the lawsuit filed against BP sought to position the oil spill as a matter that concerned humanity as such, calling attention to the absence of an adequate legal forum capable of protecting the vital cycles of global ecosystems.

"We are filing this lawsuit to break with the longstanding colonial logic of positive rights, which closes the doors to us for demanding fulfilment of the rights of nature in formal spaces," the lawsuit concluded.[15] Environmental advocacy has since its early beginnings made use of strategies of exposing wrongs to the "court public," trying to mobilize the attention of society in order to put pressure on both states and private enterprises to change their practices and conducts. By making visible certain facts and findings that had previously remained largely concealed from the public, activists seek to build up new forms of conscience, calling for more transparency in policy making and tighter scrutiny over governments and transnational corporations. The lawsuit filed against BP operated on the same plane, albeit in a totally different mode. Rather than trying to intervene in the realm of collective sensibility, it sought to question the regime of visibility that shapes the gaze of the law, exposing the partitions between those who count and those who do not count not as legal subjects, challenging the economy of distribution of rights, the limitations of existing juridical forums, and the structures of power that this regime helps to sustain.

Black Sea, Dark Earth

The framing of environmental catastrophes as events that concern universal rights and international politics is inevitably conditioned by means and channels of representation and mediatization. To a large extent, globalization and humanity—the objective and subjective conditions of universality—have been forged at the juncture between global communicational systems and what ecologist Wolfgang Sachs has called "massive accidental internationalization,"[16] the entanglements between transnational flows of information and pollution which forge a sense of a shared earthly space. The ways in which ecological disasters are rendered visible and narrated therefore have a determining effect on their political and ethical impact. One of the most notable examples in this respect, perhaps paralleled only by Chernobyl, is the accident of the *Exxon Valdez* oil spill in 1989, a paradigmatic case at many different levels. Probably no other marine catastrophe has been so extensively reported by the international media or exerted such a great influence on collective consciousness. The images of dead fishes washing up on shores, seagulls soaked in oil, and the darkened beaches of the Prince William Sound formed an iconography of sea-life destruction of sorts, a set of recognizable signs and symbols which have since been repeatedly mobilized as political-aesthetical instruments within the field of environmental advocacy and by the media at large.

The Deepwater Horizon disaster broke with this visual language. Just as the uncontrolled blowout challenged the technologies of environmental defense that had been developed in response to the contamination in the Gulf of Alaska, the devastation in the Gulf of Mexico could not be adequately indexed using the iconographic vocabulary traditionally associated with maritime oil spills. Because the leak occurred in ultra-deep water, and most of the oil was fractured by dispersants into hidden plumes before surfacing, there was little corresponding to the visual imagery that emerged from the *Exxon Valdez* disaster. Rather than pictures of darkened beaches and oily birds, the canonical images of the BP oil spill were recorded by a remotely controlled underwater camera whose primordial objective was not to mobilize public empathy but rather to perform strictly technical functions, such as aiding in the assessment of the amount of oil that was leaking and shutting down the hole. Perhaps even more than Prince William Sound, the Gulf of Mexico has been extensively monitored by reporters and activists, but the available visual code could not properly convey the real extent and intensity of the damage. The definitive image of the disaster then became much more dependent on scientific evidences.

Since the *Exxon Valdez* disaster, when scientists developed a technology called "geochemical fingerprinting"—a means of identifying a chemical signature that, similar to human fingerprints, is unique to each type of oil and thus allows precise identification between residues to their sources—environmental forensic investigations became a common feature within oil-spill litigations. This methodology enables the reconstruction of what experts call "release histories" of the leak.[17] By identifying chemical traces of oil compounds in contaminated elements, chiefly in the bodies of wildlife species, scientists can reconstruct dispersion patterns of oil flows within the ocean currents, building up a sort of model of the regional ecology. Introduced as evidentiary material within a court of law, the information extracted from this model is used to corroborate damage assessments and determine the necessary compensation measures for the reinstatement of the environment.



Fig. 3. Still image of the live feed "spill cam" captured on June 23, 2010. Source: Corbis.

In the case of the BP oil spill, in order to grasp the full picture of destruction, biologists have been archiving carcasses of dead dolphins in nitrogen freezers, as their bones and tissues are considered key evidence of the crime. Being at the top of the food web, once geo-prints are identified and it is proven that the dolphins were killed by BP, the reconstruction of the chain of events that led to their death will serve to render the most accurate view possible of the real scale of the disaster. So far there have been more than one hundred similar investigations, but it is likely that the true extent of the environmental impact of the spill will in the future remain an open question, since the more scientists investigate the effects of the disaster the deeper they plunge into the unknown nature of the ocean.[18]

A similar methodology was tested in the Ecuadorian Amazon in the early 2000s during the trial for a lawsuit that was filed by local peasants and indigenous communities against Texaco/Chevron. During almost thirty years of operating in this region, the US oil-giant corporation deliberately dumped billions of gallons of toxic waste directly into the Amazonian soils, generating massive contamination, endemic disease, and death in one of the most biodiverse regions on the planet. Famously named by activists the "Amazon Chernobyl," this ecological catastrophe was as devastating as the BP and the *Exxon Valdez* oil spills. It also shared the traits of being highly mediatized and that the full scope of the destruction was nearly impossible to represent or visualize without the aid of forensic techniques. In attempting to map the extent of the contamination and its long-term effects, earth samples were taken from hundreds of sites scattered around oil-production facilities and housing settlements, and then brought to makeshift laboratories installed in the middle of the jungle where they were precisely archived according to GPS data and geological taxonomies. Mediated by the language and tools of expert witnesses, the darkened portions of earth became central pieces of evidence within the juridical dispute.

Fig. 4. Environmental Forensics: Ultraviolet light tests used to identify residues of crude on samples of fish tissues after the *Exxon Valdez* oil spill. Source: Corbis.



Because of the vast geographic area that was affected and the long timespan of the process of contamination, causal links between sources of pollution and its direct effects upon human and nonhuman bodies are very difficult to trace. Science is thus called into court to interrogate the opaque testimony that was gradually recorded in soil transformations, the earth samples functioning as a model of an entire socio-ecological dynamic constructed over decades. The mud registers the historical agency of multiple forces and actors—the impact of the technology used to extract oil, the negligence of state institutions and corporations, the misfortune of migrant peasants and indigenous communities, wildlife refugees, polluted water streams, and contaminated atmospheres—out of which a complex political history can be narrated. As the microchemistry of the hydrological transport chain carries the traces of breaches of rights, the mud serves as a murky prism

Figs. 5, 6. Murky Evidence: Scientists extract earth samples to be examined by the court during proceedings of the trial against Chevron/Texaco in the Ecuadorian Amazon. Photos: Lou Dematteis.





in which human and natural forces are entangled into a single, relational historical force field, the environment itself appearing as the very medium of violence and, ultimately, its victim.

Insofar as nature has become a fundamental space to which cultural and political rights are bound, with increasing frequency and relevance, ecological systems inhabit the courtrooms of national and transnational forums as potential witnesses of legal violations. Shattering the limits of predefined forums, merging the laboratory and the court, ecological and legal sciences, nature participates in a scaleless political construct that connects the universal and the particular, articulating ethical engagements on behalf of humanity with the particularity of local political struggles.

Beyond Calculation

Although legal advocacy has been a central instrument in forming contemporary environmental ethos, ecology has arguably been much less influential in shaping juridical mechanisms. In the last four decades or so, a series of important international and national protocols directed at guaranteeing environmental protection has been implemented, but at a more fundamental level there has been little significant change, the ethical and philosophical foundations of modern law being rather resistant to incorporating bolder transformations that would ensure the proper protection of natural elements. The legal definition of what constitutes damage to the environment is in most cases conditioned by human-centric concepts of injury, such as damage to personal health, damage to property, or the "loss of profit" caused by the impairment of ecosystems. Therefore reinstatement of nature is often treated as secondary to human compensation. Moreover, even when restoration is directed toward the environment, the available methodologies for assessing the extent of the damage are based on cost-benefit models that reproduce similar anthropocentric rationales. Rather than protecting ecosystems per se, the current legal regime is primarily focused on the damages to the economic interests of natural or juridical persons that occur through the environment. In international maritime law, for example, liability for oil pollution other than that framed under the principles of human-based injury is limited to "costs of reasonable measure," a provision which implies that if the scale of ecological destruction is so massive that financial costs for restitution are prohibitive or that reinstatement is technically impossible, the legal resolution is to leave the environment to recover itself without any external means of remediation. In other words, the worse the damage, the more likely it is that polluters will be absolved from environment-centered retributive and restorative penalties.[19]



Fig. 7. *Exxon Valdez* crew member Robert Kagan testifies in court, 1990. Photo: Fran Durner. Source: Anchorage Daily News.

A more progressive example is found in the domestic environmental law of the United States, particularly in the Oil Pollution Act of 1990 (OPA), which arguably imposes stronger parameters for determining responses to damage to the environment itself. Elaborated in the aftermath of the *Exxon Valdez* Oil Spill, the design of OPA's legal codes reflects the public outrage over the devastation caused to the ecology of Prince William Sound and the subsequent environmentalist momentum that gathered within the US policy-making establishment. As opposed to the existing international law, under OPA the responsible party may face unlimited liability and is obliged to restore the affected environment to pre-damage conditions. When reinstatement of a particular ecosystem is considered financially "unreasonable" or technically unfeasible, some of OPA's provisions can be interpreted to request that polluters recreate a comparable biotope elsewhere.[20] In practice, however, the application of these measures has been limited by political compromises, and OPA's level of efficiency in assuring the whole restoration of natural elements seems to be rather feeble in the face of the powerful lobbying apparatus that surrounds the global oil industry. Paradoxical as it may sound, the same event that prompted the creation of OPA, the *Exxon Valdez* oil spill, is usually the example used to demonstrate its limitations, insofar as the settlements of this landmark case gave much more importance to human-based injury claims than to ecological reparation. The State of Alaska and the US Government, acting as the legal trustees of *ferae naturae*—i.e., "unowned property"—sought only one third of the estimated $3 billion in environmental damages, a number already considered highly conservative; in contrast, awards directed towards the economic harm to users of the Sound were initially set at $5 billion, roughly ten times the amount estimated.[21]

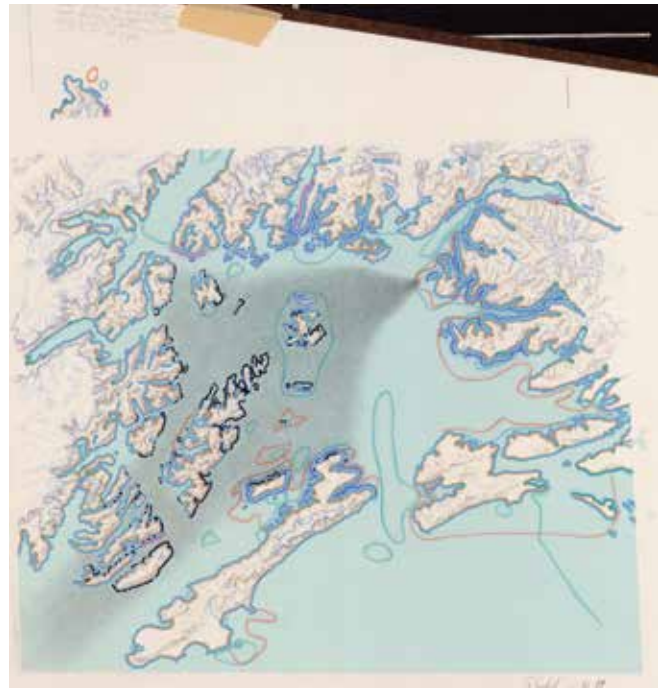


Fig. 8. Detail of a map presented in court showing the pattern of dispersion of the oil discharged by the *Exxon Valdez* vessel. Lines marked in bold black signal most severely affected shorelines. Source: Corbis.

The perverse flaws of this regime have never been more clearly exposed than in the catastrophe at the Macondo well. Immediately after the disaster struck, BP reportedly rented nearly every hotel room in Louisiana, hired local scientists under confidentiality clauses, and employed virtually every worker who was suddenly made jobless by the spill. In parallel, the company allocated unprecedented sums for an aggressive advertising campaign.[22] Promoting a good public image and assuring the public that affected communities are financially compensated may be costly, but in the final balance the political profit is rewarding. On the one hand, this strategy certainly helps to contain popular grievances, co-opt oppositional voices, and avoid public

confrontation. On the other hand, when everything comes down to a matter of paying the right price, fundamental questions about the economic and political structures of power that lay behind the disaster are left practically untouched, and little significant change in the logics of the system itself need ensue.

Two months after the blowout, BP set up a $20 billion compensation fund for the victims and says it has so far spent nearly $25 billion in clean-up efforts and restoration measures.[23] The company is en route to face a major litigation for violating US environmental laws such as the Oil Pollution Act and the Clean Water Act, which could lead to fines of up to $17.5 billion. But regardless of the disputes over these numbers, the crucial conflict that emerged out of the Deepwater Horizon disaster is not so much related to settling the right compensation formula as precisely the opposite: to what is in excess of the economy of calculations. "Even if we were capable of meaningfully establishing a price for ecological harm," explained law professor David Uhlmann, the former head of the environmental crimes section of the US Department of Justice, "there is so much that we do not know about the harm to the Gulf of Mexico—and will not know for years—that it may never be possible to come up with an accurate natural resource damage assessment."[24]

It is common sense that the fulfilment of justice in cases of ecological damage requires adequate compensation to persons that were directly or indirectly affected. Nevertheless, it is important to identify and understand the consequences of the political-ideological structures that are hidden within the legal differentiation between retributive measures to humans and nonhumans. This is not only because failing to properly recover the environment impairs the rights of future generations to access natural resources—thus violating the most basic principles of the concept of sustainability—but also because the general tendency to attribute more significance to the doctrine of "loss of profit" ends up reducing the meaning of ecological catastrophes to a matter of economic calculations. By way of expropriating the intrinsic value of forms of life other-than-human, confining all possible manifestations of nonanthropological alterity to the category of (owned or unowned) property, the current legal order functions as a mechanism that conceals the most important ethical and cultural implications of environmental crimes.

Legal Animism

By positing nature as the subject of rights, the lawsuit filed in the Constitutional Court of Ecuador was meant as a critique of the existing legal regime and its inherent anthropocentric/capitalist logic of cost-benefit calculations. Under contemporary conditions, when global natural resources tend towards scarcity, large-scale extraction activities expand, and climatic chaos ensues, the contemporary political consequences of this juridical gesture are doubtless meaningful, though the idea itself is not completely new. Perhaps the oldest and oddest of the possible examples one might mention in this respect is the fact that in medieval courts it was not unusual to bring criminal proceedings against animals, for example accusing rats of wanton destruction of crops. Similar cases have been recorded well into the twentieth century.[25] Because jurisprudential procedures of this kind today sound bizarre, and to a large extent rightly so, the concept of nature as a rights-holder tends to be criticized as being at best a naive idea that belongs to a premodern form of social contract in which the ontological distinction between things and persons was not yet clearly demarcated. At worst, the notion is condemned by a persisting colonial thinking as a facet of "primitive" belief. What its enlightened critics usually do not take into account is that modern law is essentially "animist," populated by right-holder entities whose personhood is a product of legal fiction. Corporations, for example, are defined as "fictitious persons," and under various international statutes and national constitutional provisions have their own specific rights in a manner similar to human citizens—the ultimate fetish of capital made real by law.

"We are inclined to suppose the rightlessness of rightless 'things' to be a decree of Nature, not a legal convention acting in support of some status quo," concludes law professor Christopher Stone in his groundbreaking manifesto *Should Trees Have Standing? Towards Legal Rights for Natural Objects*, arguably the first in-depth modern legal study on the possibilities of endowing natural elements with rights.[26] As with the lawsuit filed against BP in the Constitutional Court of Ecuador, Stone prepared this text as a form of intervention into a specific legal dispute, *Sierra Club v. Morton*, which at the time of his writing, in late 1971, was about to enter the US Supreme Court. The renowned environmental advocacy organization Sierra Club brought an injunction against Walt Disney Enterprises to try to block a development project in the Mineral King Valley, an important wilderness area in the Sierra Nevada Mountains in California. In the first round of hearings at lower federal courts, judges rejected the suit based on the opinion that, insofar as Sierra Club had no property holdings in the area and therefore would not suffer any direct injury from the project, the organization had no "standing" to bring the case to court. Although the Supreme Court upheld this decision, Justice William Douglas, referring directly to Stone's text, presented a dissident opinion contesting the idea that it was impossible to make a legal demand on behalf of the environment per se:

> The critical question of "standing" would be simplified and also put neatly in focus if we fashioned a federal rule that allowed environmental issues to be litigated before federal agencies or federal courts in the name of the inanimate object about to be despoiled, defaced, or invaded by roads and bulldozers and where injury is the subject of public outrage. Contemporary public concern for protecting nature's ecological equilibrium should lead to the conferral of standing upon environmental objects to sue for their own preservation.[27]

Therefore, Justice Douglas further stated, the suit would be more properly named *Mineral King v. Morton*. Animated by law, natural elements could assume a degree of personhood in a similar manner to the way other nonhuman entities such as corporations are endowed with legal personality:

> Inanimate objects are sometimes parties in litigation. A ship has a legal personality, a fiction found useful for maritime purposes. The corporation sole—a creature of ecclesiastical law—is an acceptable adversary and large fortunes ride on its cases. The ordinary corporation is a "person" for purposes of the adjudicatory processes, whether it represents proprietary, spiritual, aesthetic, or charitable causes. So it should be as respects valleys, alpine meadows, rivers, lakes, estuaries, beaches, ridges, groves of trees, swampland, or even air that feels the destructive pressures of modern technology and modern life.[28]

Justice Douglas's dissent set a jurisprudential milestone for subsequent claims and *Should Trees Have Standing*? became an influential reference in theoretical debates on environmental law. Drawing on historical relations between law, ethics, and politics, Christopher Stone shows how the modern system of rights has been progressively enlarged throughout history, demonstrating that elements once considered alien to the arena of rightness were made rights-holders following paradigmatic ethical-political transformations. He situates the question of the rightlessness of nature in relation to the jurisprudential history of the objectification of humans, as for example in the case of the legal status of women and slaves, similarly reduced to the category of property until very recently. Writing in the early 1970s, when the ecological agenda was at its height, Stone's arguments that Western-modern systems of law should consider nature as something more than just a collection of things to be possessed and mastered by humans was part of a larger set of concerns and debates that occupied diverse fields of knowledge and political forums. Yet reading his text one can grasp how the possibility of attributing rights to the environment was an idea still considered unreasonable and discredited. Such conservative reactions were not only comprehensible, Stone argued, but symptomatic. Likewise in the historical disputes concerning whether slaves should or should not have rights, whenever there was a movement to amplify the system of rights beyond those already recognized, there was fierce oppositional views, for such proposals were seen as ridiculous in themselves as much as they were considered to threaten the established power structures that they helped to maintain.



Fig. 9. Earth Justice: Superior Court Justice Alberto Guerra during proceedings of the trial against Chevron/Texaco in Lago Agrio, Ecuadorian Amazon. Photo: Lou Dematteis.

Natural Hegemony

The philosophical and juridical debates that evolved from this discussion were key elements in the development of the articles that established the rights of nature in the Ecuadorian Constitution of 2008.[29] But even more crucial was the local historical-political context from which the law emerged. Ecuador, like the rest of Latin America, is a country whose history has been determined by the heritage of colonialism. An extremely unequal distribution of land and social relations dominated by racist ideologies conditioned every domain of the country's political and economic structures, engendering a social order that was sustained by a double and entangled form of violence: the exhaustive exploitation of natural resources and the exclusion of native culture from political representation. The new Constitution established in 2008 was designed to break up that regime, reframing the role of the environment within the economy and opening up spaces of political participation for Ecuador's large indigenous population.

The foundations of this new constitution can be traced back to the landmark indigenous uprising of 1990, when thousands marched from the Sierra and Amazonia to the capital Quito demanding territorial rights and proposing the reconstitution of the state as a "pluri-national" polity; i.e., formed by multiple cultures/nationalities. In parallel, ecological issues became increasingly important within Ecuadorian politics. The maintenance of a colonial-style economy, largely conditioned by the demands of the global market for natural commodities—cacao, bananas, and, since the mid '60s, petroleum—and dependent on the subordination of Indians as a cheap labor force, generated a highly exclusionary, polarized regime. On the one side were concentrated patterns of primitive accumulation; on the other, spoliation and expropriation of indigenous lands, plunder of common resources, and endemic poverty. This context pushed territorial

and environmental issues to the center of political struggles. Furthermore, although territorially small, Ecuador is probably one of the most socio-biodiverse countries on Earth and has been the stage of one of the most devastating cases of petroleum-led environmental destruction ever recorded in history, the so-called Amazon Chernobyl mentioned above.

At the confluence between indigenous culture and modern environmentalism—the former characterized by carrying a powerful land ethics grounded on nonutilitarian relations to nature, and the latter informed by scientific visions of a living biosphere—the politics of the rights of nature were gradually forged in Ecuador. "When we approved the rights of nature in the Constitution, this process implied a reflection on what exactly nature is," explained ecologist Esperanza Martínez:

> For science it is one thing, for the indigenous people another, for law another one, and for capitalism yet another. For capitalism nature is environment: a place where one extracts resources within certain limits. The indigenous people have a distinct notion: nature is not only the ecosystem, but also spiritual beings. In the case of biological sciences, it depends from which scientific paradigm you depart: are human beings included inside nature or not? So we are not speaking about the same thing. When we decided to adopt the term *Pachamama*, it was foremost an act of acknowledging the wisdom of those who are so closely tied to the earth. It was also a critical act in relation to the classical notions of environment and nature.[30]

Considering the "pluri-national" constituency of Ecuador, and therefore the diverse cosmologies nurtured by the different indigenous cultures and nationalities, it was necessary to take into account multiple forms of conceiving of and relating to nature—that is, to acknowledge by law the existence of, quite literally, different natural worlds. "It was an act of openness, of opening to diversity," recounted Martínez, which required the introduction of a concept broad enough to allow for a certain mediation between the conflictive conceptions of nature that coexist within the geographical borders of the Ecuadorian state. *Pachamama*—usually interpreted as *Madre Tierra*, "Mother Earth," a mythical deity entity that is omnipresent in Andean indigenous cultures—was the chosen concept to guarantee that Amerindian cosmologies were politically represented within constitutional law. "If modernity has adopted a single paradigm, one single rationality, one sole model of nature," Martínez concluded, "what we are saying is that there is not only one but many, as many as there are cultures."[31]

By radicalizing the "animist" condition of modern law, extending the notion of universal rights towards nature, the Ecuadorian Constitution could be interpreted as a pragmatic attempt to critically respond to the limits and flaws of what philosopher Bruno Latour has called "the modern constitution"—i.e., the foundational law of modernity, which is instituted by the

sectioning of reality in two great and separated poles, namely the world of objects and the world of subjects, nature and culture.[32] While defining a common ground between humans and nonhumans, the rights of nature disrupts this border regime, projecting a form of social contract that seeks to break with the hierarchies and systems of domination between humans and nature upon which Western politics and culture are based.

There are of course many unsolved questions that emerge together with the idea that nature should be granted rights that had previously only been attributed to humans. The most important of these, perhaps, concerns the way that, while it attempts to break with the divisions established by "modern constitutionalism," the law seems simultaneously to be reinforcing them. By granting exclusive rights to nonhuman natural elements it risks drawing even stronger borders between one domain and the other, thus contributing to the reaffirmation of the validity of nature as an epistemic category when the reality on the ground constantly points to its obsolescence. And this at a moment when, given the historically unprecedented anthropogenic impact over the whole planet, nature, once and for all, is definitely "over." But it is also true that nature has been declared over many times before. And yet we have never felt its presence so strongly, bursting over shores, flooding cities, disrupting agricultural cycles, and triggering large-scale human catastrophes.

The concept of the rights of nature is above all a tactical tool, a political instrument, as perhaps all laws are, either in the hands of those who oppress or of those who resist oppression and domination. On which side does it stand in the current order of things? The Ecuadorian Constitution must be interpreted as part of a larger historical process of reformulating the state apparatus which, together with the new Bolivian Constitution of 2009, represents what Brazilian jurist Carlos Marés de Souza has called "the second moment" of Latin America's "new constitutionalism."[33] The first moment emerged in the context of the constitutional reforms of the late 1980s/early '90s amid the paradoxical conjuncture between the process of transition toward democracy after the long period of military dictatorships that ruled most of the continent during the Cold War, and the subsequent consolidation of the neoliberal order. During this period there were significant advancements in relation to the rights of the so-called minority groups, chiefly indigenous and Afro-descendent peoples. This led to the introduction of a set of legal measures aimed at including linguistic, ethnic, and cultural diversity as part of the reformulation of the national polity, a movement that followed a broader cultural turn in the definition of civil rights. In many different ways, the "exclusive rights" that were implemented by these constitutional reforms came as a form of reparation; that is to say, they functioned as a legal instrument designed to guarantee the transformation of a social order that had been built upon structural cultural violence.

This politicization of culture was fundamental to breaking with the homogenizing authoritarianism inherited from the former regimes and for responding to the demands of marginalized groups to whom access to legal

and political representation has been historically denied. Nevertheless, as multiculturalism gradually became a useful engine within the managerial logics upon which neoliberal forms of power were formulated and deployed in the following decades, the agenda of political transformations that was put forward at this crucial moment, which implied a radical and broad reconfiguration of the whole state apparatus, came to be absorbed into the localized and specific demands of particular communities: merely culture, no longer politics.

Whereas cultural homogenization is certainly intrinsic to modernity's foundational law, alterity is fundamental to modernity, even if only in the form of a domesticated or repressed imaginary or as a subjected position that functions to legitimize hierarchies of power. Rather than cultural difference, what escapes the framework of modern constitutionalism is a "different nature"—that is to say, dissident political-ecologies that implicitly challenge the objectified idea of nature upon which the multi-cultural universalism of modernity was constructed. As anthropologist Eduardo Viveiros de Castro has insisted on different occasions, modernity is fundamentally "mono-natural."[34] This is neither an innocent nor a merely symbolic construction. Thus when considering the global hegemony of modernity's constitutional laws, we must take into account the history, the methods, and the means by which mono-naturalism was enforced on the ground and the latent violence that was implicit in that process. Not in the sense, or not only in the sense, of forms of epistemic violence that attempt to subjugate or eradicate alterity in forms of knowledge and practice, but in terms of the proper material, geophysical dimension of that violent process through which nature was confined to the position of an object of human mastery and possession. Alongside cultural domination, the enforcement of a natural order has been one of the most powerful instruments of power and domination in modern/colonial history. Subjective and objective violence—violence against cultures and violence against nature, ethnocides and ecocides—have often come hand in hand. The "new constitutionalism" of the '90s created legal codes that should limit and restrain the former; the recent new constitutionalism represented by the Ecuadorian Constitution addresses the latter.

The colonial and postcolonial histories of the process through which modernity's "constitutional law" became globally hegemonic have been criticized primarily because of their intrinsic cultural violence; i.e., because the diffusion of modernization has been largely guided by the destructive intent of modeling and homogenizing other cultural formations according to occidental paradigms of civilization. The emerging practices around the concept of nonhuman rights might allow us to frame that process from a different and complementary perspective, one according to which it is not only the question of cultural hegemony, but also that of the imposition of a "natural hegemony," that is politically crucial. While the modern constitution has been increasingly tolerant in relation to the cultural pole, it has remained firmly grounded in the perpetuation of mono-naturalism. Perhaps the most relevant question therefore is not so much how culturally tolerant the enlightened, Western-based category of universal humanity can be, but precisely the opposite: how modernity, together with its laws and politics, might accommodate "different natures" besides and beyond the monolithic version upon which it was constituted. This is arguably the crucial political and ethical imperative whose time has come.

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August 15, 2013. Working in my office in the old colonial center of Quito, rereading this text and making final adjustments, it feels necessary to add some extra closing remarks. Though short, and somewhat misplaced, these final notes are so relevant to the current political situation here (and elsewhere in the world, I believe) that, if not left to the bottom margins, the entire text would probably have to be changed completely. I recall Eduardo Galeano's famous axiom, "in the outskirts of the world the system reveals its true face,"[35] hoping that this marginal conclusion can shed new light on what was written above.

From 2008 to 2013, the situation in Ecuador has significantly changed. The revolutionary hopes that were attached to the new Constitution—the product of what has been named the "citizenship revolution" or "twenty-first-century socialism"—have dissipated under the resurgence of an aggressive and authoritarian neo-extractivist politics. Fueled by the demands of the Chinese market, much of the Ecuadorian Amazon is being opened up for large-scale oil-drilling and mining operations. In parallel, peasant and indigenous leaders and environmental activists who are fighting under banners such as "rights to water" are being constantly harassed by an increasing policing apparatus. Despite the hopes raised by the constitution of a radically new "civilizational pact," old schemes of power are being reinforced: human rights violations and violence against nature operating entangled within a single political engine. Perhaps nothing is more expressive of this process than the executive legal decree that was launched today by the government to halt the Yasuni-ITT project, the utopian initiative of leaving large reserves of oil underneath the Amazonian soil. The current conflicts that ensued reveal much about the coming into being of a new logic of geo-power—one which will attempt to enclose large tracts of the seabed, plunder the earth's deep crust, appropriate lands that are surging below melting glaciers, and colonize the last realms of tropical forests. It is, however, within this context that the law of the rights of nature has proved to be a powerful instrument of political action, within and outside formal courts of law, all the way down to the streets of Quito.

1 Michel Serres, *The Natural Contract*, trans. Elizabeth MacArthur and William Paulson (Ann Arbor: University of Michigan Press, 1995), 3.

2 Information drawn from the forensic engineering and risk analysis report published in March 2011 by an independent research unit based at the University of California. See Deepwater Horizon Study Group (DHSG), *Final Report on the Investigation of the Macondo Well Blowout* (Berkeley, CA: University of California, 2011), available at http://ccrm.berkeley.edu/pdfs_papers/bea_pdfs/dhsgfinalre port-march2011-tag.pdf.

3 By early June, clean-up operations involved approximately forty-seven thousand people and seven thousand vessels. See Jonathan L. Ramseur and Curry Hagerty, Cong.

Research Serv., R42942, "*Deepwater Horizon* Oil Spill: Recent Activities and Ongoing Developments" (2013), http://www.fas.org/sgp/crs/misc/R42942.pdf.

4 Rocky Kistner, "The Macondo Monkey on BP's Back," *Huffington Post*, September 20, 2011.

5 For a detailed account of the controversial claims over the leak-flow rate see the special report *BP's Deep Secrets* produced by investigative news agency Mother Jones at http://www.motherjones.com/special-reports/2010/09/bp-oceans, accessed September 2013.

6 Gianluigi Zangari, "Risk of Global Climate Change by BP Oil Spill," Frascati National Laboratories – Italian National Institute of Nuclear Physics, http://www.associazionegeofisica.it/OilSpill.pdf, accessed September 2013.

7 Paul Virilio, *The Original Accident* (Cambridge: Polity, 2007), 10–11.

8 David Bond, "The Science of Catastrophe: Making Sense of the BP Oil Spill," *Anthropology Now*, vol. 3, no. 1 (April 2011): 36–46.

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11 Julia Whitty, "The BP Cover Up," *Mother Jones* (September/October 2010), http://www.motherjones.com/environment/2010/09/bp-ocean-cover-up.

12 Esperanza Martínez interviewed by the author, Quito, November 2011.

13 Lawsuit on Behalf of the Rights of Nature under the Principle of Universal Jurisdiction, filed November 26, 2010 in the Constitutional Court of Ecuador, at 1. Emphases are mine.

14 BP Lawsuit, 2.

15 Ibid.

16 Wolfgang Sachs, "Environment," in *The Development Dictionary: A Guide to Knowledge as Power*, ed. Wolfgang Sachs (New York: Zed Books, 2010), 25.

17 Zhendi Wang and Scott A. Stout, *Oil Spill Environmental Forensics: Fingerprinting and Source Identification* (Burlington: Academic Press, 2007). See also Brian L. Murphy and Robert D. Morrison, eds., *Introduction to Environmental Forensics* (Burlington: Academic Press, 2007).

18 Under US environmental law, the methodology for establishing ecological harm is defined by "Natural Resource Damage Assessments" (NRDA). One year after the disaster, Suzanne Goldenberg reported that more than one hundred NRDA were being conducted. Suzanne Goldenberg, "Deepwater Horizon aftermath: how much is a dolphin worth?," *Guardian*, April 19, 2012.

19 Dramé Ibrahima, "Recovering Damage to the Environment *per se* Following an Oil Spill: The Shadows and Lights of the Civil Liability and Fund Conventions of 1992," *Review of European Community & International Environmental Law*, vol. 14, no. 1 (April 2005): 63–72.

20 See ibid.; and Michael Mason, "Transnational Compensation for Oil Pollution Damage: Examining Changing Spatialities of Environmental Liability," LSE Research Papers in Environmental and Spatial Analysis, no. 69 (2002), available at: http://eprints.lse.ac.uk/570/, accessed September 2013. US legal provisions to "make the environment and public whole" are defined by the Code of Federal Regulations, 15 CFR § 990.30. Another more recent example that attempts to deal with "pure ecological damage" as opposed to traditional forms of injury is the EU Environmental Liability Directive, Council Directive 2004/35/CE, 2004 O.J. (L 143).

21 James Liszka, "Lessons from the *Exxon Valdez* Oil Spill: A Case Study in Retributive and Corrective Justice for Harm to the Environment," *Ethics & the Environment*, vol.15, no. 2 (Fall 2010): 1–30.

22 Whitty, "BP Cover-Up."

23 Dominic Rushe, "BP compensation fund for Gulf oil spill victims at risk of running out," *Guardian,* July 2, 2013.

24 Quoted in Goldenberg, "Deepwater Horizon Aftermath."

25 Jeffrey Kastner, "Animals on Trial," *Cabinet*, no. 4, "Animals" (Fall 2001).

26 Christopher Stone, "Should Trees Have Standing? Towards Legal Rights for Natural Objects" was originally published in 1972 in the *Southern California Law Review*, vol. 450. The quotation is from the version that later appeared as the main article of the book *Should Trees Have Standing: Law, Morality, and the Environment* (New York & Oxford: Oxford University Press, 2010), 2.

27 *Sierra Club vs Morton*, 405 US 727 (1972), http://supreme.justia.com/cases/federal/us/405/727/case.html, accessed September 2013.

28 Ibid.

29 A reconstruction of the debates around the Rights of Nature in the Constitution of Ecuador was included in two books edited by Alberto Acosta and Esperanza Martínez: *Derechos de la naturaleza: El futuro es ahora* (Quito: Abya-Yala, 2009); and *La naturaleza con derechos: De la filosofía a la política* (Quito: Abya-Yala, 2011). On the influence of Christopher Stone's legal analysis, see especially the text of lawyer Mario Melo, "Los derechos de la naturaleza en la nueva constituición ecuatoriana," included in *Derechos de la Naturaleza.*

30 Interview with the author, Quito, November 2011.

31 Ibid.

32 Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1993).

33 Carlos Marés de Souza interviewed by the author, Curitiba, Brazil, April 2012.

34 Eduardo Viveiros de Castro, "Os pronomes cosmológicos e o perspectivismo amerindio," *Mana*, vol. 2, no. 2 (1996):115–44. See also Bruno Latour, "Facing Gaia: Six Lectures on the Political Theology of Nature," Gifford Lectures, February 18–28, 2013, available at: http://www.bruno-latour.fr/sites/default/files/downloads/GIFFORD-SIX-LECTURES_1.pdf.

35 Eduardo Galeano, *Days and Nights of Love and War* (London: Pluto Press, 2000), 170.

DOWN TO EARTH
John Palmesino and Ann-Sofi Rönnskog
Territorial Agency
with images by Armin Linke

From a remote sensing satellite capturing images of the Polar Regions at 800 km over the surface of the earth to a Soviet experiment drilling at depths of 12 km under the surface of the earth, these images chart a journey through a sequence of planetary strata, exploring the different territories and technopolitical assemblages that become visible at each juncture. This vertical cross-section reveals a shift in the modes by which the earth is represented and produces new knowledge about its systems. Recently algorithmic models—computer simulations of past as well as projected transformation of the earth—are replacing physical evidence in constructing our understanding of contemporary territories and their polities. In the process of modeling they also expose the complex spatial and political transformations taking place across and within the deep surfaces of the earth.



Site of Kola Superdeep Borehole, 2012.

The Deepest Point on the Planet

The Norilsk Nickel mine in Zapolyarny, Murmansk Oblast, Kola Peninsula, Russia, at 69°23'47.27"N, 30°36'35.53"E, in the European Arctic is the site of the Kola Superdeep Borehole. Norilsk Nickel is the largest mining and metals company in Russia, the world's largest producer of nickel and palladium, and one of the world's major producers of platinum, rhodium, copper, and cobalt. The Kola Superdeep Borehole was a major scientific experiment carried out by the Soviet Union, with the aim of drilling as far as possible into the earth's crust. In 1989, it reached 12,262 meters, the deepest point on Earth ever drilled. The aim of the mission was to investigate the Mohorovičić discontinuity, the boundary between the earth's crust and the mantle. The mission produced a number of significant scientific advances that led to a substantial revision of geophysics, as we will later show.

Space Race

The Kola Superdeep Borehole mission was initiated in the late 1960s as a part of a wider effort to extend the geophysical knowledge of the Earth System and was planned alongside an array of similar activities around the world. Drilling started on May 24, 1970, from the Uralmash-4E drilling rig, and went on until 1989, when the SG-3 borehole drilled by the newer Uralmash-1500 rig reached the deepest point on Earth, deeper than the depth of 10,915 m previously recorded in the Mariana Trench in the western Pacific.

These ambitious experiments undertaken to observe the geological workings of the earth were mirrored in the Space Race: while it was the USA that first touched ground on the moon, the Kola Superdeep Borehole outpaced American attempts to reach deep down into the earth's crust. Despite the major scientific breakthroughs enabled by the advanced technology of the Soviets, in the popular imagination efforts to reach new heights above the planet's surface outshone the achievements of science in plumbing new depths beneath it.



Kola Science Center, Apatity, Russia 2012.

The 380.2 kg of lunar rocks and regolith that the Apollo missions to the moon brought back are stored at the Lunar Sample Laboratory Facility, whereas the 4 km in total length of core samples of the Kola Superdeep Borehole are scattered throughout a wide range of scientific labs and research centers in Russia, Europe, and the rest of the world. The main archives are stored at the Kola Science Centre RAS in Apatity, Russia.

Both narrative trajectories—the landing on the moon and the voyage to the center of the earth—conceal the contested relation between evidence based political organization and the projections of modernity. While ideological divisions shaped political discourses in radically antagonistic ways, both sides of the Iron Curtain were developing a political space of operation at unprecedented scales and magnitudes. The vast infrastructures implied by these experiments to reach new heights/depths required, in turn, a new conceptualization of the space of politics, one that had a geopolitical dimension that extended its technological reach from deep down into the lithosphere through the higher reaches of the thermosphere into the exosphere. This expanded notion of the political as inscribed into new and distant territories required different tools and new technologies and consequently influenced planning and decision making at all levels. The result of this new condition was the emergence of a geopolitical asset dominated by scientific developments and organized by evidence-based politics.

Integrated assessment reviews are the form through which evidence operates today in shaping the relations between policies, actions, and the material forms of cohabitation of contemporary polities and institutions. These are based upon complex computer models derived from the work on the Nuclear Winter: models of the atmospheric impacts of countervalue nuclear attacks in the Cold War, which were devised by Paul Crutzen and John Birks, and further developed into climate change models. They comprise complex system analysis built up through the combination and integration of expert rationalities and sectoral studies. They form a new landscape marked by knowledge borders and disciplinary boundaries and scattered by competing interests and divergent trajectories of development. Here evidence is produced through complex calculations and interventions, and is conceptualized as modulation, containment, intensification, the slowing down or delimitation of boundary conditions.



Olenegorsk-1, early warning radar system against ballistic missile attack, Kola Peninsula, Russia. Multiyear spectral anylsis: Territorial Agency, 2013.

Escalation

The Kola Superdeep Borehole is a vertical probe into the Baltic Shield. As the largest area of oldest rock in Europe it has been eroded by glaciation and a harsh climate. At its highest latitudes, the Baltic Shield meets the Barents Shield, forming the Kola Peninsula, one of the richest areas in the world in terms of natural resources. The exploitation of the vast mineral resources of the peninsula provided the basis for Soviet industrialization. It was the intrinsic connections between the development of scientific knowledge, the geophysics of the region, and technologies needed for industrial expansion that shaped Soviet territorial architectures.

These construction processes, based upon scientific developments, both reorganized the conception of sovereignty and deeply modified the territories of the Baltic Shield. During the twentieth century, the Shield has been involved in a wide-ranging reassessment of the relation between political structures and their spaces of operation: from the 1917 Revolution to the experiments with sovereignty in the Åland archipelago, the territorial structures of the Molotov-Ribbentrop Pact and the Winter War, to the industrialization of the Soviets; a fast-paced succession of different forms and practices of sovereignty, connected to different conceptions of the relation between human law and nature. Driven by extensive Soviet experiments to live rationally with nature, the territories of the Kola Peninsula were subject to a large-scale plan to populate the Arctic and to establish a rational and scientific base for the exploitation of its resources.

The Kola Peninsula was one of the sites of a new experiment in developing scientific sovereignty, one that reshaped the connections between human actions and natural processes. The links between the biosphere, the atmosphere and the geosphere are here extended to the noosphere, the space of human thought conceptualized at the Kola Science Center by Vladimir Ivanovich Vernadsky in the 1920s. Scientific evidence guided the development of a new space, where authority was based on a systematic extension of science into all realms of human activity. This extension also reshaped the physical strata, which politics started to operate in.

The Murmansk harbor in the north of the peninsula became the head of a complex bundle of infrastructures, industries, extracting facilities, science cities, and secret military complexes, with an overall population of more than one million. The entire material basis of the Kola has been reshaped by this momentous effort: into the mining industries and the boreal forests, the acid rains, the nuclear wastes, the lakes and tundra, are carved the traces and marks of human transformations of the surface of the earth. The distinction between the surface of the planet and human impact upon it is no longer possible. A new stratigraphy was formed by this experiment with serious consequences for and impacts upon the environment.

The northeastern extension of the Baltic Shield, the Kola Peninsula, was the Cold War border, the point where the Iron Curtain met the Early Warning System, scanning the Arctic for intercontinental ballistic missiles, and marked by escalation strategies and second-strike retaliation analysis. It is a border making military, economic, and political divisions, yet across which opposing sides are linked by a common rationale based on calculus, simulation, and the closed systems of scientific technological development.



Boreal forests affected by acidification, Monchegorsk, Kola Peninsula, Russia, 2012.



Norilsk Nickel plants in Nikel, Kola Peninsula, Russia, 2012.

Errors

To go astray, to wander, and to err are actions that operate upon other actions; they don't appear in the singular. They operate within a field of forces and are characterized by having an identifiable overarching order. Deviations from this order are detected, measured, and calculated, with the aim of controlling, adjusting, reintegrating, and eliminating. Errors are elements of the system that at once reveal and delimit its structured form. They are the constitutive elements of a dynamic system. Yet the baseline—the asymptotic line that marks the normal order of the system from which errors deviate—can only be approximated, modeled, simulated. It can only exist within the realm of calculus and abstraction.

Predictions, plans, and projects form the basis upon which modern polities are constructed. These contemporary polities also operate in two different modes in relation to evidence, and the Kola Superdeep Borehole experiment lies at the intersection between them. On one side, evidence is the direct conceptual correlation between hypothesis and reality. The Kola Superdeep Borehole set out to measure the Moho discontinuity and, on its way down, discovered a number of mistakes that demanded revisions in our understanding of the earth's geophysics, its thermodynamic properties, dynamics, and history. Evidence extracted from the drill and measured on site was the literal marker of errors in the theory. On the other side, contemporary measurement and observations, forecasts, and simulations operate primarily through models. Predictions can either be founded upon base level models, where initial states are extrapolated into the future, or boundary value models, where liminal conditions are observed or fixed and used to calculate change and transformations through the evolution of a complex system model. In this second sense, evidence can only be understood in relation to the model: evidence is the rational link between errors and models.



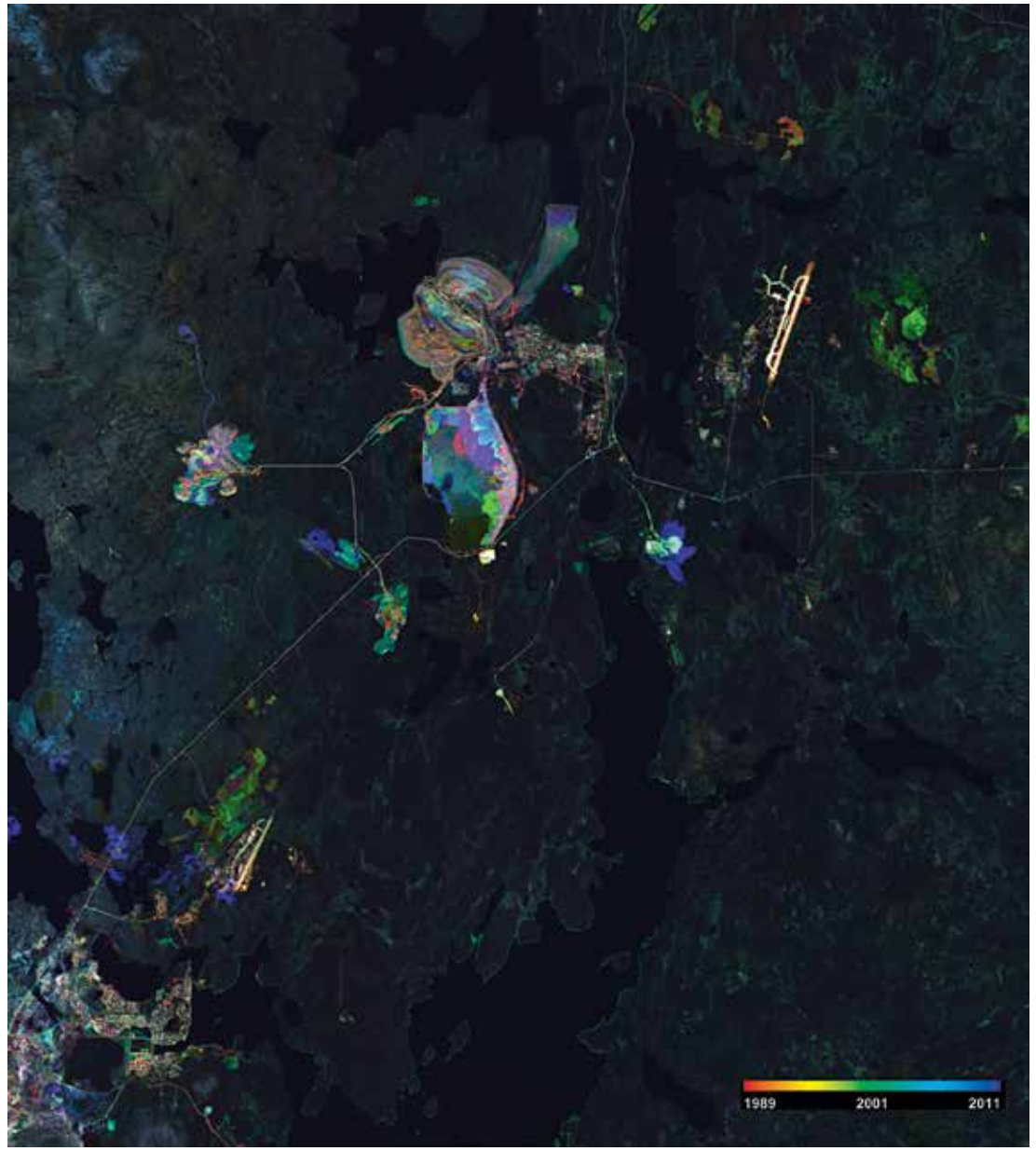
Monchegorsk, Kola Peninsula, Russia, 2012.

From Cold to Warm War

The coevolution of the space race and the race to the deepest points of the planet traces a vertically organized space of measurement, sensing, and modeling. From the 12,262 m of the SG-3 to the 800 km–high orbits of Earth observation satellites, everything that can be detected is measured. This is a space operated through the "vast machine" of sensors and computers of climate change science and integrated system analysis. The Earth System, the complex set of interdependencies and interrelated dynamics modeled, simulated, and calculated by global change sciences, reveals a new architecture: a new relation between polities and space, where plans, projects, and political drives are no longer geared towards a synchronized scientific future.

The satellite sensors capturing the radiation of the planet indicate a series of nonaligned and asynchronous changes in the disposition of materials on its surface. Driven by the measurement of environmental variables for climate change science, new industrial operations to exploit mineral and natural resources are today carving into the surfaces of the planet at unprecedented levels of magnification.

Today, the Kola Peninsula—along with many other northern territories—is shaped intensively across a wide range of apparently non-connected elements and spaces. The materials that form the surface of the earth in this region are mapped and analyzed as they undergo processes of transformation. Sounding the spectrum between the frequencies of 0.45–0.52 µm, the electromagnetic reflections detected by the multiple sensors of the Landsat 7 depict the transformations in the hard surfaces, those constituting the substrata, the infrastructure of human activities. These are markers of complex procedures to control, modulate, contain, and frame the shifting links; they are the markers of unequal durations, ages, and rhythms of transformations between the formation of contemporary polity and contemporary space: they indicate a shift away from Cold War rationality to Warm War investment, with negotiations and disparities on all sides. They are the marks of the new geological epoch shaped by mankind: the Anthropocene.



Olenegorsk, Kola Peninsula, Russia. Multiyear spectral analysis: Territorial Agency, 2013.

Transparent Earth: The Autoscopy of Aerial Targeting and the Visual Geopolitics of the Underground

Ryan Bishop

> The image always comes from the sky—not from the heavens, which are religious, but from the skies, a term proper to painting: not heaven in its religious sense, but sky as the Latin *firmamentum*, the firm vault from which the stars are hung, dispensing their brightness.
> — Jean-Luc Nancy[1]

In Book III of Jonathan Swift's 1726 savage satire *Gulliver's Travels*, Swift turns his rapier rhetoric on a host of speculative theories and theorists receiving large financial support from the wealthy and powerful in the emergent eighteenth century.[2] Among these is the theory of magnetism, which finds its applied form as military technology. In the novel, the magnetic principles expounded by William Gilbert and exemplified by his "terella" or "little earth" showed how gravity could be overcome by using its power and pulls against itself, thus achieving for magnetic bodies set in opposition against the earth the capacity to levitate. Clearly Swift intends to have levity triumph over gravity. Taking Gilbert's "terella," a ground magnet contained in a glass that floated above an oppositely charged loadstone, he creates his own little earth: the flying island of Laputa.

The island could fly and hover and menace its ground-dwelling enemies from the air through numerous means, some more benign than others: from blocking their access to sunlight or rain and thus causing environmental disaster (rather like contemporary "weather war" strategies) to actually crushing the enemy below, "which makes a universal Destruction both of Houses and Men."[3] Putting aside the derogatory Spanish name of the island, we note a few prescient elements to the satire: the support of scientific inquiry for the mastery of nature turned to potentially exploitative ends, the shift from scientific speculation to application (from science to technology), the application of said technology for military use, and, more importantly, the removal of the ground from the earth to become a platform in the sky, thus rendering sky as earth to control the ground from the air. The threat on the ground, as it historically has been, often comes from the sky, from its exposure to whoever can visually survey and control it from above.

Tempting though it is to dwell on Swift's flying island and its multiple manifestations in the trajectories and genealogies that can be traced from the seventeenth century to the present, we shall simply use it as an allegory of sorts for initially considering the ways in which science and technology reconfigure imaginaries to such an extent that they can decontextualize the ground from the earth, make the sky into a staging ground for surveillance and attack, and repeat Heidegger's famous dictum that the essence of technology is nothing technological—that it instead resides in the immaterial, the noetic influences that render the world possible and malleable. The physical constraints of nature become those areas that certain forms of technoscientific inquiry wish to erase or turn to their advantage, as made manifest in aerial technologies and aerial aesthetics deployed by various militaries, especially through various optoelectronic devices operating from above.[4] The purpose is to gain a vertical advantage and control the ground for one's own ends, and to do so the sky proves essential. When Peter Adey eloquently asserts that "both the ground and the air reside in vertical reciprocity,"[5] he is surely correct, but this does not mean that the reciprocity is by any measure equal, and nor does it diminish the human desire to use the latter to subdue and dominate the former.

For all of their appeal to the hubris of mastery, however, what aerial surveillance and targeting provide is both revelation and ignorance: a view we did not possess previously and a reminder that there is more there that cannot be seen, either due to technological limitations or to physical limitations apparently insurmountable by technology at a given moment. The triumph of the surface is unavoidable in the visual domain, and aerial surveillance and aesthetics are almost completely dominated by that which constitutes the visible. But the visible, like the tactile, can only engage surfaces. The most emergent and immediate dimensions of the object, that which is graspable by hand and eye, predominate. Yet the surface also always presumes a depth underpinning it: the aerial view always implies and depends on the subterranean invisible. And depth is accessible only by sound and sound waves.

Thus we find a major US Department of Defense initiative of 2010 called "Transparent Earth," one that would not be out of place in Swift's Book III of *Gulliver*—an effort by the Defense Advanced Research Projects Agency (DARPA) to read beneath the earth's surface. More than half a century of advanced satellite episcopy has rendered the surface of the earth consistently and constantly visible, resulting in the concomitant defensive move of underground weapons systems, battlements, and sites. Deep underground military bases (DUMB) provide the military's highly developed systems and technics of aerial observation with their biggest challenge yet, for they cannot be seen or interpreted with any sense of accuracy. To read beneath the earth's surface, the US military is investigating numerous strategies, including harnessing lightening (natural and artificial), radio signals, and complex algorithms to "see" through other sensorial means.[6]

The underground plays an increasingly large role in US cutting-edge military research and strategy, though it takes its symbolic, discursive, and material leads from the foundational moment of the current nexus of military, technological, academic, and aesthetic inquiry: the Cold War. "The

underground is the paranoid aspect of the Cold War, the dark space beneath the symbolic order reigning above," Tom Vanderbilt writes. "It is a paradoxical netherworld of both security and insecurity, the place in which we seek shelter, store our possessions, hide our weapons."[7] The underground marks the new frontier of surveillance and military intelligence challenges, and it does so due to two important developments: the political and environmental risks associated with using nuclear weapons to counter underground defensive strategies (the strategy up until the late 1990s), and the overwhelming success of the drive to map and always watch the surface of the earth, in "real time," anywhere (thus rendering the entire surface of the earth easily targetable by conventional weaponry). The visual capabilities and capacities of the unblinking eyes in the skies have driven those being watched underground, away from sighted surveillance and in protection from the sighted weapons that almost inevitably follow from aerial sighting: the line between seeing and targeting being a slim one.

The most significant of current military plans to obtain vision below the earth's surface deploy synaesthesia, the connection of two or more senses and an aesthetic mode much favored by avant-garde artists at the turn the century. The commonly held division between technology and aesthetics becomes difficult to maintain when considering how each side mobilizes the senses, thus revealing aesthetic experimentation as a way to render more precisely the vast surveillance and war-making machines of the early twenty-first century.[8] An important irony emerges because the very military technological trajectories that led the way in hardening the divisions of the senses and reifying the sensorium also led the way in optoelectronic and tele-technological synaesthesia, especially through the conversion of sound patterns into visual data and images of terrain at long distances (e.g., underwater), or ofmoving objects such as planes, missiles, or tanks.[9]

The use of combinatory senses to render a visible image of that which could not be seen (the underground) provides yet another attempt to remove the ground of error for military observation and control. At the same time, this attempt reveals both the desire for mastery operative in the view from above and the persistence of that which eludes mastery, both of which can be tied to a faith in technologies to deliver desired ends and fix emergent problems. Telecontrol and action-at-a-distance are hallmarks of the use of the air to control the ground, but the reflective surface of the ground and that which lies below it provide obstacles for mastery while revealing many underlying assumptions driving cutting-edge military technology. Similarly, these technological innovations reinforce and intensify these assumptions, desires, and goals: in this instance, to see through the earth's crust while also standing firmly on it by simultaneously occupying aerial, terrestrial and, subterranean domains. The prosthetically outfitted subject is simultaneously encouraged and thwarted in the desire for enacting agency and control through tele-technological extensions, rendering the subject (rather like the underground itself) paradoxically more secure and insecure at the same time.

Surface Readings: The Ground of the Image

> At the peak of our technological performance, the irresistible impression remains that something eludes us […] that, in effect, it is not we who are winning out over the world, but the world which is winning out over us.
> — Jean Baudrillard[10]

There are essentially two types of invisibility: one would be the invisible that can be rendered visible through technological intervention (e.g., X-ray, over-the-horizon viewing technologies, night vision, or even the light that helps us avoid stubbing our toe on a table leg at night). This contingent invisibility operates with regard to the empirical realm of the visible, and thus is potentially visible. As such, this domain of visibility opens itself up to a range of representational manipulations and constitutes the visible and invisible as a continuum: vision and its horizon. The other kind of invisibility is of a more radical stripe for it is that which can never be rendered visible, the structural necessity of invisibility by which visibility is possible at all. It is the ground of possibility for visibility. Both military technology and experimental avant-garde aesthetics of the early part of the twentieth century address this second kind of invisibility in an attempt by the former to eliminate it, and by the latter to insist on its inviolability.[11] This tension about the invisibility that is the ground of possibility for visibility tells a story that runs from more than a century as the drive by technoscience to extend the power of the senses, particularly vision, has been appropriated by military and corporate sectors in the name of defense, health, and entertainment. Yet the ground of the image extrapolated from this tension necessarily lies below the surface and thus poses further challenges for various vested interests.

The tension between forms of invisibility and how to engage them depends upon additional structural relations, including surface and depth, as well as the visible or legible and what supports it. To engage aerial sightedness—or even vision in its most basic form—is to yield almost completely to the promise and problems posed by the surface. For, as noted, the visible, like the tactile, can only engage surfaces. If something is visible, touchable, it is de facto a surface, and thus reliant upon some other entity, some other ground, not visible or graspable for its support. The ground of the image, therefore, becomes something simultaneously necessary and uncontrollable. However, with instrumental justification and rationale in the ascendancy for the most powerful sectors of the majority of nation-states, the most emergent and immediate dimensions of the object—those that are graspable by hand and eye—become dominant. Yet we know about the dangers of surface readings for literary study, religious hermeneutics, political analysis, knowledge accumulation, romantic love…anything that uses a literal or figurative surface-depth oppositional pattern. Aerial visual technologies and aesthetics—views from above—are almost solely grounded, literally, in the terrestrial. They are rarely *of* the sky and

almost exclusively *from* the sky for vertical, top-down capture and manipulation, and as a result remain stuck as surface readings.

Therein resides the problem posed by the elided relationship between image and ground. The limit is the ground: the ground of the image and the ground of the earth. This is where aerial technologies and aesthetics meet their limits. With the view from above, an image of mastery is derived, but only apparently so. The image, too, in Jean-Luc Nancy's words, is "inseparable from a hidden surface, from which it cannot, as it were, be peeled away: the dark side of the picture, its underside or backside."[12] The backside of the image of aerial surveillance of the globe, the ground of the image, is the underground: the dark depths of unstable *terra firma*. So the aerial view always implies and depends on the subterranean invisible. Such implication and dependence necessarily evades the complete mapping and surveillance of the earth allowed now by satellite viewing technologies. The now-commonplace assumption that various militaries can see anything, anywhere, anytime is belied by the ground of what it sees, which is after all only the ground and the built environment atop it.

Mastery is inescapably haunted by that which eludes it. The underside of what is visually apprehended, itself constituted by our apprehension of surfaces alone, means that the imagination begins acting up and wheedles its way to the fore. What lies beneath? we ask. How can we see *that*? And once we do, how can we see what grounds even *that*? The drive for mastery generates such a set of questions that runs to infinity, rupturing its goal (i.e., mastery) in the process. This partially explains why the imagination has played such a pivotal role in conceptualizing the underground—Plato's cave through Virgil's *Aeneid* to Orpheus to Pluto to Dante's *Inferno* to Poe's inner ocean to Jules Verne to H.G. Wells's many underground worlds to Dostoyevsky's existential scribbler on through to Saddam's complex underground bunker network[13]—thus generating fear and fascination out of its elusiveness. A possible interim solution to this particular problem of visibility and invisibility, of viewing and imaging depth and not surface, can be found in a synaesthetic paradox—that is, through a confusion of the sensorium. Depth can be accessed by sound, revealing the limitations of sight while also providing it with a synaesthetic and prosthetic extension. Sound will let us see where vision stops.

Geomancy and Artificial Lightening

> Underground is truly the final frontier.
> — Mark Smith of the Geospatial Corporation, a solutions provider for the underground infrastructure industry[14]

> He was about to hurl his thunderbolts
> At the whole world, but halted, fearing Heaven
> Would burn from fire so vast, and pole to pole
> Break out in flame and smoke, and he remembered
> The fates had said that some day land and ocean,
> The vault of Heaven, the whole world's mighty fortress,
> Besieged by fire, would perish.
> — Ovid[15]

The DARPA project called "Transparent Earth" continues that agency's longstanding interest in "mastering" or "lording over" nature, according to an article on the US Homeland Security newswire.[16] From planet hacking to changing meteorological conditions (also known as "enemy climate" or "weather war") to experimenting with broadcasting frequency ranges in the ionosphere to create nuclear-sized explosions without radiation, DARPA has long sought technological solutions for the limits imposed by physics and nature in the successful operation of military strategy and engagement, including that oft-heard element of surprise (itself part of the DARPA mission statement). DARPA describes itself as an organization that believes "it is better to invent a head-mounted multispectral imaging device than curse the darkness," articulating perfectly its understanding of the relation between technology and physical limitations, especially when it comes to the division between the visible and the invisible.[17]

With "Transparent Earth," the agency is attempting to convert its visual mastery of the earth's crust, its capacity to convert geography (geo-graphy, writing on the earth's surface) into geology, a logos of the earth. The hermeneutics of aerial vision is turned into inscription, revealing the interpretive reality that each decoding is also an encoding. The geomancy of converting military geography into military geology entails the move from surface to deep reading, which is always preferred in analytic or interpretive situations. The shift to the emphasis on the underground brings a specific avant-garde movement in contemporary military technological research back to a pivotal moment in the history of the industrial scientific revolution, with its emphasis on geology. Charles Lyell's groundbreaking *Principles of Geology*, published between 1830 and 1833, helped overturn long-held Christian dogma by furthering James Hutton's uniformitarianism in the popular imagination, inspiring Charles Darwin to make the same kind of mark in biology with similar theories, and sending thousands of Victorians sleuthing in shale in search of fossils. By proving that the earth was older than Church teaching and science influenced by religion claimed, and by finding evidence of change within and the loss of a given species, Lyell contributed to altering the commonly held worldview from a static to a dynamic one while also indicating the precarious nature of all living creatures on the face of the earth—a face that in the slow glacial movement of geological time would eventually be buried, leaving imprints of its former dwellers (e.g., us) stamped in stone. His work emerged with the simultaneous drive to fuel the industrial revolution with mineral resources that resulted in the increased import of mining and

study of the earth, and thus the rapid technological development in the extractive arts. The study of mines and mining became essential in the nineteenth century, and many tertiary institutions were opened to meet the rising need.[18]

As is always the case with military-based research, DARPA makes dual-use claims about the work involved in trying to see, read, and map the ground beneath the earth's surface by arguing that such knowledge could help generate tools for anticipating natural disasters, in addition to "detecting, targeting, and destroying hard and buried underground facility (UGF) targets," presented almost as an afterthought.[19] Toward that end the agency is spending four million dollars to create real-time, 3D maps of the physical and dynamic properties of the earth down to five kilometers, a small but important horizontal slice of the 3,500-mile stretch from crust to core. That five-kilometer swath, though, is about as deep as most tunneling or drilling projects can go, making it the most data- and information-rich portion invisible from the ground or the air (for military purposes anyway but not necessarily for predicting earthquakes, one should note). The entire project is targeted to be operational by 2015. The end result, so DARPA claims, will eclipse even the visual capacity from the air for mapping, tracking, and sensing the above ground natural and militarized world. The resultant imaging devices derived via sound will generate, so the claims run, perfect representational images of the uncanny landscape of the geophysical and human-created underground.

To generate these maps, a host of projective tools and developmental sensors will be deployed, including algorithms that estimate and predict tectonic shifts and other subterranean movements. Sensor technology will enable updates of the maps provided by the geoscientific algorithms and extant geophysical maps. New tools and techniques, though, play an integral role in bringing the "Transparent Earth" project to fruition. One of the more promising areas of research for rendering invisible the opacity of the earth has been the use of extremely low radio frequencies (ELF 3 Hz to 30 Hz 100,000 km to 10,000 km) and very low frequencies (VLF 3 Hz to 30 Hz 100 km to 10 km). These frequencies create radio signals that can be transformed into a visual signal, much as radar or ultrasound technologies do, rendering invisible sound waves visible as they move through subterranean spaces. Geophysical surveying has used naturally occurring ELF/VLF producers, such as lightning, for quite some time. Because they are naturally occurring, they are rather hard to come by. Now the US Department of Defense wishes to harness this strategy but to do so as and when they please: lightning on demand, as it were.

This kind of research touches on the highly controversial work being conducted by the Department of Defense and many research universities under the project called the High Frequency Active Auroral Research Program (HAARP). A lightening rod for conspiracy theorists because of its connections to warfare weather and "geohacking," HAARP studies various forms of wave technology in strategic relation to the ionosphere for its potential with radio communication and surveillance (e.g., over-the-horizon radar) as well as exploring its potential as an offensive weapon.[20] A small and seemingly more benign part of the strategy of the military with HAARP is a project to generate S-BUG, Sferics-Based Underground Geolocation (sferics is short for atmospherics, -spherics), thus using artificial lightning to create a GPS for underground formations. The goal, however, is grander than GPS, with the hope of a much more fully developed final collection of linked maps of the subterranean world than what we currently possess for the terrestrial one.[21]

"Nimbus," a DARPA project to trigger and manipulate lightning, represents a development that will result in Zeus-like capacity with lightning bolts being hurled across the ether at will largely to create VLF radio signals necessary for generating the sound waves required for mapping underground developments and structures. VLF radio signals were used by submarines to "see" the bottoms of the oceans during World War II, and massive transmitters and receivers known as umbrella antennae dotted the landscape of Europe at the time. These antennae provide the logo for the HAARP project: the spokes atop a long mast resembling an umbrella shed of its cloth, an umbrella's skeletal structure rendered visible through its surface, as it were. The logo thus visually performs by analogy the surveillance work it carries out in the aural-optical domain.

Essentially, "Transparent Earth" wants to create a very large telestethoscope that can make images, thus repeating the discourses of early medical science in early twenty-first-century military technological ones. The syntax of sight that Foucault argues in *The Birth of the Clinic* was emergent from late eighteenth- to early nineteenth-century medical practice focuses on the continued blurring of the once hard and fast boundary between the visible and invisible. The medical gaze, aided and abetted by multisensory prostheses such as the stethoscope, opened up the body to the objective eye of the practitioner and brought forth its previously stored mysteries. At that particular juncture in the history of medical practice, the living body, the diseased body, the corpse, all opened up their dark tyrannical interiors to the liberatory practices of the clinical space and the precise discursive practices. The body became like a text, unfolding in its legibility and rendering the implicit as explicit to the trained eye of the corporeal hermeneutician. These are the same assumptions, goals, and methods we find operative in the project called "Transparent Earth." Taking the layers and folds of the earth found in that important natural science text, Lyell's *Principles of Geology*, "Transparent Earth" melds Lyell's promises of reading the earth's interiors with those found in modern medical practice to survey the inner workings of the earth's core; and to do so, according to the current plan, nature must be mobilized by instrumental reason and for human ends.

Hiding Surfaces and the Autoscopy of Aerial Targeting

> And suppose further that the prison had an echo which came from the other side, would they not be sure to fancy when one of the passers-by spoke that the voice which they heard came from the passing shadow?
> — Plato[22]

We return now, in conclusion, to Plato's cave. In the parable, those chained inside the cave mistake the images before their eyes for reality when they are in fact merely shades cast by a crude shadow-puppet apparatus. The verity of the illusion, as the quotation in the epigraph explains, is rendered more fully by an aural mirror that reflects sounds as if coming from the images when they actually originate at the mouth of the cave, providing a kind of ventriloquistic tossing of the voice. We need to note that Plato's story centers on the fallibility of the senses, the mistaken impressions created by and as empirical evidence, and in this instance through the coordination of sound and image with regard to the position of the subjective recipient of the information. The Platonic conceit of the aural mirror as error, as further confusion of illusion for the real, is a cautionary tale, as are most parables, one with resonance (if we can pardon the term) for HAARP, "Nimbus,"and "Transparent Earth." What if the immense technological prostheses producing synaesthetic images and maps of the underworld's forms, formations, and installations prove illusory or simply mistaken? And what if they are in error, when the lightening flashes, the underground reads, the deep hermeneutics operate, and the weapons follow hard on their heels in a closed system of machinic identification, targeting and firing? The possibility emerges that the trick-of-the-light-as-aural-sound-effect might well turn out to be just a trick of the light and a sound effect, and not a perfect image or map of subterranean structures.

And what then? Perhaps a return to a position of the sensing subject with the earth no longer transparent but newly reformed as solid beneath its feet, the objects of the world opaque once more and impervious to penetration, and no desire for them to be otherwise for the purposes of the extension and control of the domain perceived by this sovereign subject?

No, likely the standard answer we receive now is the one that will emerge later: more technology to rectify the negative effects, problems, and inadequacies generated and perpetuated by previous technological application. The very essence of the momentum of technicity takes over once again. Our grasp will continue to exceed our reach, not the other way around as commonly held, and thus producing effects of which we know not.

The ubiquity of aerial views of landscapes or cities in cinema and photography exhibitions have rendered them commonplaces. Some kinds of aerial views, though, are rarer, indeed pathological. One of these is called "autoscopy," that is, viewing oneself, seeing oneself as a self viewing itself: both viewing subject and viewed object. Neurologists use the term to describe out-of-body or near-death experiences, and particularly in the latter cases when the body and the self are clearly *in extremis*, the perceiving subject sees him/herself from several feet in the air above the supine body. It is an aerial view determined by trauma or dementia. Some neurological studies link this phenomenon of seeing oneself in extrapersonal space as a pathological response to position, movement, and completeness of the body, arguing that it results from a failure to understand and process proprioceptive, visual, and tactile information. The effect is almost the neurological counterpart to ghosting for analogue broadcast television but the experience of subjective viewing of the self changes that very experience. We are not seeing two of the same object as in televisual ghosting but rather seeing ourselves as an object from the position of our embodied subjectivity—like looking in a mirror but without the mirror or at a hologram projection of ourselves. However rare these neurological phenomena may be, the vastly successful eye-in-the-sky optoelectronic technologies used for global surveillance and targeting have rendered us all in a state of autoscopic *extremis*, able to see ourselves simultaneously as viewed and viewing subjects, embodied in both positions simultaneously in real-time in two distinct spatial positions. We can call this effect "the autoscopy of aerial targeting."

In this effect we project a viewing subject above, one that is not us but a simulation of us that allows us to see ourselves, and others, from above in such a powerfully mimetic manner that we can believe, as in the pathological state, that it actually is us viewing too: the projection as actual. In the process, though, we also view and target ourselves. We additionally target the earth's crust and now, with "Transparent Earth," we target that which lies below the crust as if ground and underground were somehow separate from us. We have reified a solipsistic loop of sensory projection and reception in which nothing exists outside the viewing subject, even when that viewing subject is also the object of the view. However, this is a trick of optoelectronic tele-technologies, one that makes our astral out-of-body perceiving selves seem to be or feel to be our real selves, not understanding the effects of the actions as felt and experienced on the ground, which is both where we actually dwell and what we seemingly wish to render transparent. This perceiving and hovering self is no longer a neurological anomaly or neo-necromantic epiphenomenon but rather the consolidated result of massive spending, intensive research, military-driven geopolitical theorization about and application of whiz-bang tele-technological prowess, and synaesthetic manipulation. That is, it is us.

1 Jean-Luc Nancy, *The Ground of the Image*, trans. J. Fort (New York: Fordham University Press, 2005), 5.

2 A full-length version of Ryan Bishop's text was first published in *Theory, Culture & Society*, vol. 28, nos. 7–8 (2011): 270–86.

3 Jonathan Swift, *Gulliver's Travels* (Boston, MA: Bedford Books, 1995), 165.

4 The classic text on the relationship between visualizing machines and the war machine is Paul Virilio's *War and Cinema: The Logistics of Perception*, trans. Patrick Camiller (London: Verso, 2000), though he also has pursued these links in several other works. Similarly, many other theorists have explored this relationship, particularly Peter Adey, Louise Amoore, Ben Anderson, John Armitage, Benjamin Bratton, David Campbell, Caren Kaplan, Jordan Crandall, Rey Chow, James Der Derian, Manuel DeLanda, Gilles Deleuze and Felix Guattari, Steve Graham, Derek Gregory, Martin Heidegger, Sven Lindquist,Paul Saint-Amour, and Eyal Weizman, just to name a few. Also, my own work has been involved with these issues for some time, both writing done alone or with Greg Clancey and/or John Phillips. I am indebted to all of these scholars and our many discussions and collaborations.

5 Peter Adey, *Aerial Life: Space, Mobilities, Affects* (Malden, MA: Wiley-Blackwell, 2010), 3.

6 For a nice overview of the military problems provided by underground installations, as well as an explanation for their rapid growth and ways to neutralize those problems, see the 2000 report by Lt. Colonel Eric M. Sepp (US Air Force), "Deeply Buried Facilities: Implications for Military Operations," May 2000, http://www.dtic.mil/cgi-bin/GetTRDoc?AD=ADA425461. Sepp examines the issue from a number of different perspectives, including built environment, architecture, existing sensors, developmental technologies and the dangers of the unintended consequences of trying to neutralize such sites inasmuch as massive force can result in increased environmental and military problems, depending on what is stored underground. Thus the desire to see the outline of underground facilities leads to the further desire (or need) to see inside the facilities.

7 Tom Vanderbilt, *Survival City: Adventures among the Ruins of Atomic America* (Princeton, NJ: Princeton University Press, 2002), 129.

8 Synaesthesia held a special place in the work of many early twentieth-century avant-garde movements as an attempt to undermine the increasingly rationalized and separated domains of the senses as well as to their extension, modification, or control by various prosthetic technological enhancements. For an extended discussion of the relationship between sensory manipulation in art, literature, and music and how it pertains to developments in military technology, see Ryan Bishop and John Phillips, *Modernist Avant-Garde Aesthetics and Contemporary Military Technology* (Edinburgh: Edinburgh University Press, 2010).

9 The modes of resistance within the artistic movements and aesthetics, then, merely served to give these forces their next logical step, even if it was illogical (illogical insofar as it is the domain of avant-garde artistic experimentation). See Bishop and Phillips, *Modernist Avant-Garde Aesthetics*.

10 Jean Baudrillard, *The Perfect Crime*, trans. Chris Turner (London: Verso, 1996), 71.

11 Bishop and Phillips, *Modernist Avant-Garde Aesthetics*, 63–66.

12 Nancy, *Ground of the Image*, 2.

13 See Rosalind Williams's evocative book on the underground in relation to the literary and technological imagination, *Notes on the Underground: An Essay on Technology, Society, and the Imagination* (Cambridge, MA: MIT Press, 1990).

14 "Geospatial Corporation maps the world under the Earth's crust," March 10, 2010, http://www.homelandsecuritynewswire.com/geospatial-corporation-maps-world-under-earths-crust.

15 Ovid, *Metamorphoses*, trans. Rolfe Humphries (Bloomington: Indiana University Press, 1960), bk. I, lines 253–59.

16 "The last frontier: DARPA wants to make the Earth's crust transparent," March 10, 2010, http://homelandsecuritynewswire.com/last-frontier-darpa-wants-make-earths-crust-transparent.

17 Ibid.

18 Mines, of course, become the model for a host of underground structures, most especially fallout shelters for individual nuclear families or for large-scale civil defense, as espoused by Herman Kahn and his RAND studies and immortalized in Stanley Kubrick's 1964 *Dr. Strangelove* as a site of potential weakness in the US nuclear strategy, a "mine gap." Using the ground as a mode of military defense has a fairly contemporary genealogy too, one that runs through the trench to the bunker. As World War I honeycombed much of Europe's soil and inspired the postwar underground control center that became part of the Maginot Line, the use of reinforced concrete in these fortifications helped Hitler and his officers to envision and realize a massive underground command post that would use communications tele-technologies to conduct far-flung aboveground military activities from the relative safety of the underground, impervious to the newly sanitized mode of warfare called aerial combat. Attack from the air was condemned as "uncivilized" by the US and European nations when practiced by the Japanese on China but was rehabilitated as essential for the Allied forces when they realized how effective firebombs in Tokyo could be.

19 "The Last Frontier."

20 See http://www.haarp.net.

21 The DARPA 2013 fiscal year budget lists the following accomplishments: completed design of prototype hardware for subsurface receivers and processors and through-the-earth communications; built and tested prototype hardware (receiver and processors) for sferic-based geopositioning and navigation; and demonstrated above ground to below ground geopositioning. "Department of Defense Fiscal Year (FY) 2013 President's Budget Submission" (Unclassified), February 2012, http://www.darpa.mil/WorkArea/DownloadAsset.aspx?id=2147484865.

22 Plato, "Republic," in *The Dialogues of Plato*, vol. II, ed. B. Jowett (Oxford: Clarendon Press, 1953), 163–499, 376–77.

Geoforensics: Underground Violence in the Atacama Desert

Godofredo Pereira

> If other ancient people have great works of which they still feel proud, if some have great temples, others made major roads, others built pyramids, and those peoples became famous for such works, some day, to posterity, the vast terraces that copper workers have built on that site, will become a monument to honor the generations that have worked in these mines.
> — Fidel Castro[1]

Atacama

Academic and scientific research on the Atacama Desert, in Chile, tends to focus either on its unique geo-climatic conditions—as the driest place on Earth—or its long history of resource extraction and cycles of urbanization.[2] However, with the exception of Alonso Barros's correlation of the massive 1877 earthquake with Chile's victory in the subsequent War of the Pacific,[3] there hasn't been a systematic analysis of the role the desert plays in Chile's history. Despite clear evidence of its historical importance,[4] official reports on human rights abuses produced after the fall of Pinochet's dictatorship mostly ignored the fact that one of the main motivations for the coup of September 11, 1973, and the violence that followed was the control of the Atacama's natural resources.[5] In fact, the mineral wealth of the desert motivated conflicts along a much longer history, extending all the way to the present.

More than simply being a motive for conflict, the desert is also a weapon of violence: it imposes extremely harsh life conditions on its population of mining workers and indigenous inhabitants—conditions of scarcity that are exploited by mining corporations to facilitate dispossession and land grabbing. Indeed, during the last forty years, large-scale mining has contaminated air, water, and soils, further exacerbating the already dramatic conditions of the Atacama and contributing to the disappearance of agricultural communities. However, mining corporations frequently refer to the desert's complex climatic and geological conditions in order to deflect their responsibility for environmental damage and contamination.

It is in relation to such violence to both people and environments that, in the Atacama, new technologies of forensic analysis and remote sensing are becoming increasingly relevant in legal disputes. While techniques such as DNA analysis, bone sampling, and mass spectrometry have revolutionized

the practice of legal medicine—for instance, allowing an investigator to determine whether the presence of a toxic metal in a body resulted from criminal action—the development of satellite spectral imagery, ground-penetrating radar and reflective seismology has given visibility to previously barely perceptible aspects of the earth. But in unique cases like the Atacama, where geological and human domains are so intimately connected, such new disciplines can no longer remain separate. I propose using the term "geoforensics" to indicate the need for such practices to come together to form a common mode of inquiry, so that it becomes possible to investigate human rights claims and environmental disputes as part of an entangled condition.



Fig. 1. Chuquicamata copper mine. Color composite image enhancing in magentas and blues the presence of jarosite, a result of oxidized pyrite, typically found in copper mining rock waste. Landsat 8 OLI, April 2013. Source: US Geological Survey. Composite image: Godofredo Pereira.

"Removal of Televisions"

In 1973, Augusto Pinochet instructed a military group to travel the country and "expedite processes and uniform criteria in the administration of justice" to political detainees. It became known as the "Caravan of Death," and executed a total of seventy-one people without formal trials, with the government claiming they had fled the country. As part of the Caravan's activity, on October 19, 1973, in the mining town of Calama, twenty-six people were made detainees and later killed, most of them workers from the nearby Chuquicamata mine. Their whereabouts remained for many years a mystery, with their families kept unsure whether they were dead or alive. Later, in 1975, a few miners spotted several bodies, around twenty kilometers southwest of the city, while collecting calcium carbonate in the desert. According to one, the bodies "were still buried but their shapes could be discerned," apparently because of the effects of wind erosion.[6] Later they returned but couldn'tlocate the bodies again, and the fear of reprisals prevented them from officially reporting the findings.

Nonetheless, it is thought that because the story of these sightings reached higher levels of military command, the bodies were exhumed and later made to disappear in a wider operation referred to as the "Removal of Televisions" (*Retiro de Televisores*). This operation took place during 1978–79 and involved the exhumation of numerous people killed by the Caravan of Death. This gruesome military operation derived its name from the attempt to eradicate media coverage as part of the regime's campaign to cover up its crimes, following the discovery, in November 1978 in Hornos de Lonquén, of the bodies of fifteen farmers killed by the police. Despite the military junta's control over the media this finding became one of the first to receive domestic and international attention, as it brought to light the plight of the missing detainees (*detenidos desaparecidos*) in Chile for the first time.

After the decryption of the of category A1 (maximum urgency) cryptogram ordering Operation Removal of Televisions, it was discovered that Augusto Pinochet himself ordered these exhumations along with the final disposal of all remaining evidence. A report in 1990 by the Commission for Truth and Reconciliation (also known as the Rettig Report) concluded that the bodies of these detainees had probably been thrown from planes and helicopters into the sea, into volcanoes, or scattered over the desert.[7] Years later, in 1995, when the mass grave near Calama was finally exhumed (its specific location was in Quebrada del Buitre), few remains were left. Part of a skull, some mandibles, and some teeth were almost all the evidence left behind by the military. According to the Chilean Medico-Legal Service (SML), in the area of Calama all that remained were a total of approximately one thousand very small fragments.[8] Nonetheless, it is from these small bone fragments and the occasional personal object that the forensic teams have been able to identify some of the disappeared, allowing their funerals to take place. Thanks to advances in forensic procedures, particularly

in forensic genetics and anthropology, of the original twenty-six disappeared the SML has so far been able to identify twelve.

But it is not only people that are missing. The desert itself has also disappeared, at least from visibility and attention, lost somewhere in the background of events that clearly could not have taken place without it. It was the extensive swathes of no-man's-land in the Atacama that provided the geographic conditions needed to hide the bodies of the dead in the first place, thus allowing the government to suggest that those people had fled the country; it was the desert's windy climate that eroded the top of the grave to reveal the hideous crime that lay hidden; and it was the desert's dryness and zero humidity that allowed the few remaining bones to be in perfect condition for analysis and identification. As if in the desert every event is necessarily bound by the rules of geology, both geomorphology and stratigraphy are becoming essential tools in forensic investigations; the first required to discern surface abnormalities that might indicate the possible existence of buried bodies, and the second to understand the sequence of events through the analysis of geological strata. It is because of this that forensic exhumations are typically conducted by teams that include not only forensic anthropologists, criminologists, or doctors, but also archaeologists, chemists, and geologists.

The ability to identify bone remains in the desert has obviously been extremely important in pursuing legal charges against those who perpetrated crimes during Chile's dictatorship. But what has been less clear is the intimate relation of the desert itself with these crimes, and particularly the role of copper, an element that persistently remains outside of any account. Feeding the town of Calama is the monumental Chuquicamata mine. Owned by the US Anaconda Copper Company until 1971, when Allende's government nationalized it with the unanimous support of the Congress, this vast, man-made canyon (which Fidel Castro likened to the Egyptian pyramids) became emblematic of Chile's new symbolic and economic claim to sovereignty. Such was copper's relevance to the Chilean economy that Allende himself called copper "the salary of Chile" (*el sueldo de Chile*). But because of this, it is impossible not to link the process of nationalization implemented by the revolutionary government with the September 11, 1973 coup d'état that led to Allende's death and the mass disappearances that soon followed. After all, this was a coup that stood for the new economic management of Chile's mineral resources. Moreover, the murderous violence that followed the coup was focused particularly against the syndicates of copper miners and their political power, as suggested by the inclusion of Calama in the route of the Caravan of Death.



Fig. 2. Multispectral image from 2013 focusing on an area 5 km south of Calama where marks resemble a 2 km long curved dagger, the infamous "corvo" characteristically used by the Chilean military to slit the throat of foreign enemies. Image © 2013 DigitalGlobe, Inc. All Rights Reserved. False color composite: Godofredo Pereira.



Fig. 3. Multispectral image where the numbers 73 and 78 can be seen traced on the ground next to the dagger. Considering that 73 was the date of the coup d'état, and 78 the date of Operation Removal of Televisions, their presence was suggestive of a possible gravesite. Image © 2013 DigitalGlobe, Inc. All Rights Reserved. Color composition and enhancement: Godofredo Pereira.

Recently the SML went back to Calama to investigate a mysterious satellite image in which the shape of a dagger could be seen traced in the desert together with the numbers 73 and 78, suggesting the possible proximity of a mass grave.[9] The Chilean dagger (*corvo*) is an historical military symbol; it was in 1973 that the coup took place, and 1978 was the date when the military exhumed the mass graves to erase evidence of their crimes. Despite these indicators, nothing was found; nevertheless, it is significant that Chilean forensic teams attempting to locate mass graves have started to use the same ground-penetrating radars and satellite images that are often used for the prospection of copper and other minerals. In this way, bringing together the traces of bones and minerals, forensic technologies make evident how the Atacama's geography provided both the method for the occultation of corpses and the conditions for their discovery. But more importantly, as tools of mineral and geological inquiry, they bring forth the role of the desert itself in motivating this conflict in the first place.

Water Code, 1981

After the coup of 1973, a series of policy shifts took place that reversed Allende's nationalization of copper and progressively implemented an economic model that had drastic consequences for the populations inhabiting the desert area. Of key importance was the Water Code of 1981, introduced to promote private investment in mining. According to lawyer Nancy Yañez this code installed a "gratuitous, perpetual, and unconditioned right to water usage. This right was constituted by an administrative act, independently of the claimant being the owner or not of the land where the water is located, and whether or not effective or beneficial usage was being made. There were no costs for maintaining or managing the resource, and it was only reassigned by market trade, being a right that was transferable, transmissible, and prescribable."[10] In addition to treating water as any other commodity, it separated it as property from the ownership of land, allowing the free buying and selling of water, without demanding compensation for the generation of adverse effects in surrounding territories. This conversion of collective into private property allowed copper companies to appropriate the massive amounts of water required for mineral processing, dust suppression, and drinking, and at the same time to gain control over vast areas of the desert, effectively dispossessing existing communities.

The extraction of water for mining purposes in the Atacama, made possible by the legal framework implemented by Pinochet's regime, enhanced its already dramatic scarcity, making the lives of indigenous peoples inhabiting the oases of the Loa (the only river in the desert) almost impossible, and resulting in a drastic decrease in population in some affected areas—particularly the ones affected by the expansion of the Chuquicamata copper mine.[11] A recent study of the village of Quillagua evidences how the decrease in liters per second of river water rights for agriculture over the past forty years mirrors the decrease in population.[12] Moreover, between 1997 and 2002 Quillagua was drastically affected by several events of large-scale water contamination, leading to the destruction of its agricultural way of life.[13] According to analysis conducted at the time, the river had been contaminated by xanthate, a chemical used in copper mining and not naturally found in water.[14] And today, a sixty-five-square-kilometer tailings pond, where liquid waste from copper processing is deposited, is expanding close to the river Loa, having already contaminated two important underground aquifers that sustain several agricultural areas. Thus, as a vital resource for indigenous communities and mining operations, in the Atacama water has become, simultaneously, a central object of conflict and the very means by which conflict takes place.

If the previous case required an ability to bring together human rights and geological analysis in order to discover traces of the disappeared, in the case of water appropriation the central concern lies in disentangling what is of human from what is of nonhuman origin: firstly, there is the difficulty

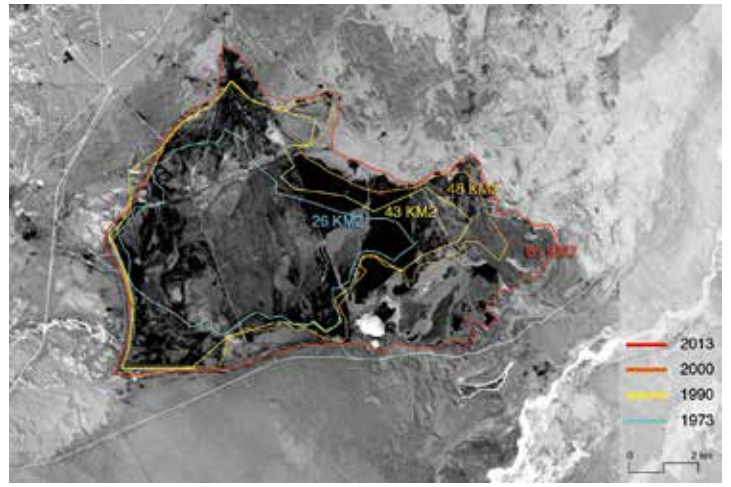


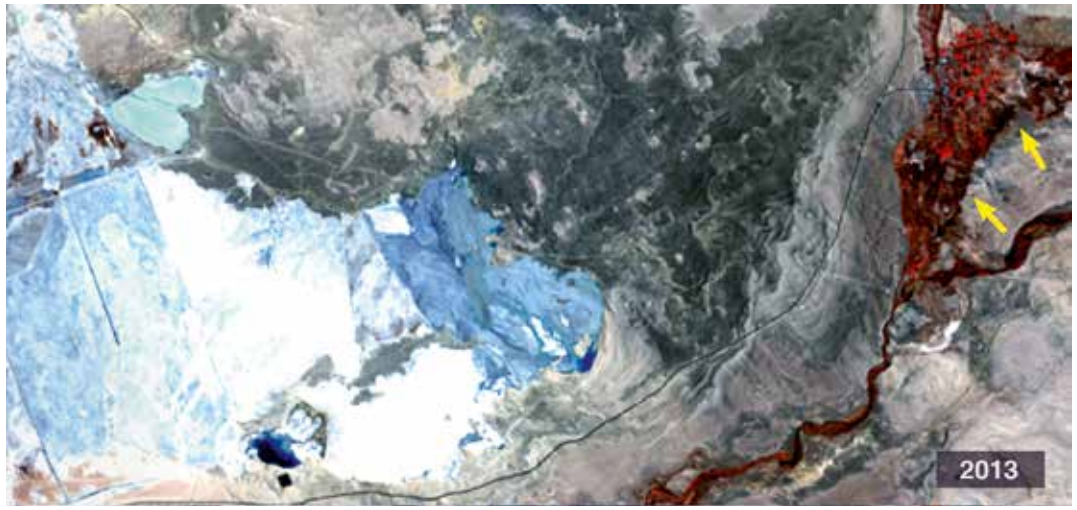
Fig. 4. Diagram indicating the growth of the tailings pond Talabre, traced over Landsat images from 1973, 1993, 2003, and 2013. Courtesy of the US Geological Survey. Visualization: Godofredo Pereira.

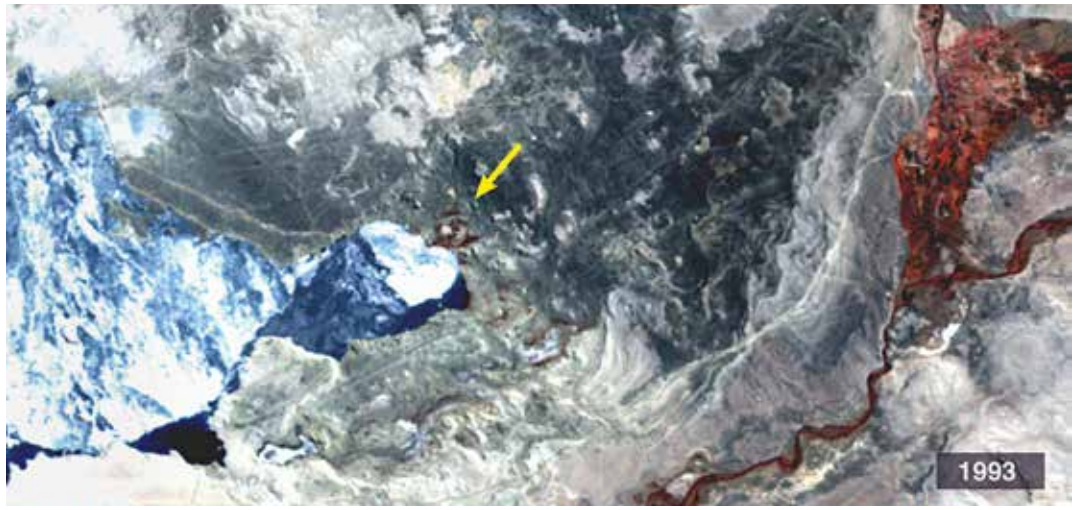
of discerning between effects that result from water appropriation by mining and those which can be attributed to the conditions of the desert itself; and secondly, there is a problem of discerning contamination caused by mining from the effects of upstream geyser fields (El Tatio) that naturally release arsenic into the waters of the Loa.

With regard to contamination, water sampling becomes a major scientific and political tool, through its ability to discern chemical components in water before and after it comes into proximity with the copper mining areas. As for water appropriation, this can hardly be measured, as copper companies are not obliged to divulge how many liters of water per second they are taking from the river. In any case, these analyses are only able to focus on singular aspects of the problem. And neither is able to extensively measure the underground aquifers that are as important as rivers in the provision of water to soils and vegetation.

Faced with these difficulties, an alternative approach, bringing all these water issues together so that an argument around environmental destruction can be made, has been the measurement of consequences: the deterioration of vegetation is a symptom of both water decrease and pollution. Because of this, its measurement is a very effective tool, as it correlates water with the natural ecosystem on which local peoples depend for survival, and with the help of available satellite imagery is able to give a historical record of its transformation over time. The point of contention thus shifts from simply arguing that copper companies fail to follow environmental regulations, to arguing that environmental regulations are inadequate, in that they take into consideration neither the history of environmental depletion over the past forty years, nor the "natural" conditions of the desert, which clearly magnify the effects of contamination or appropriation.

Based on this reasoning, an analysis of Landsat data for the villages of Chiu Chiu and Quillagua during the past forty years was developed using a tool called the Normalized Difference Vegetation Index (NDVI),[15] which uses the differential of spectral reflectance of vegetation in red and near infrared radiation bands to provide a coefficient of vegetation quantity and health for the area. And indeed this analysis has shown a constant trend of vegetation decrease from 1973 onwards that is consistent with the decrease in population and water availability.[16] Considering that there were no relevant alterations in rainfall and glacier water sources during this period, the investigation clearly points to mining as being responsible for the decrease.





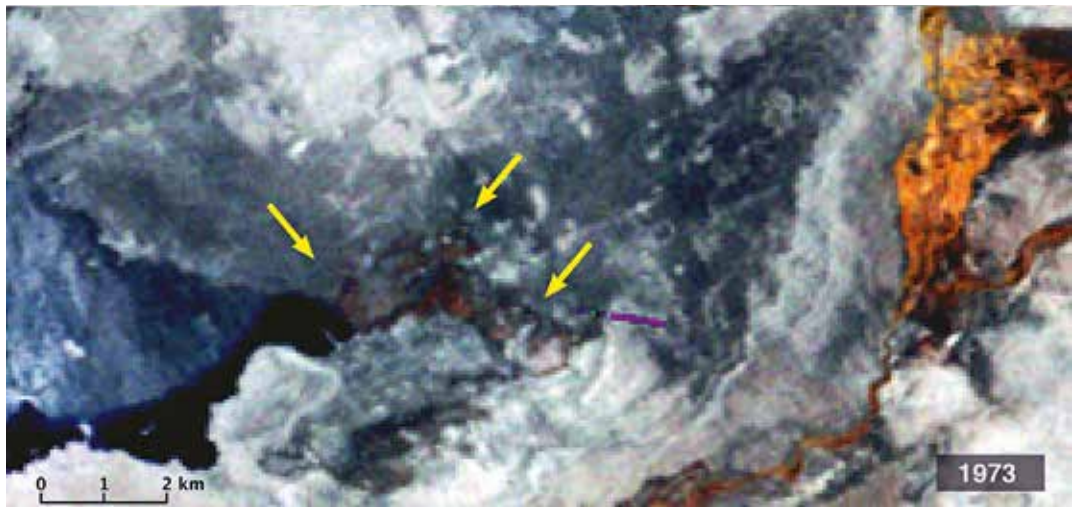
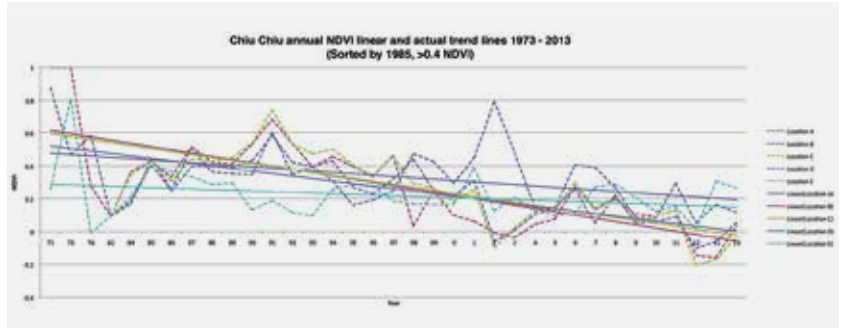


Fig. 5. Comparison of Landsat color composite images from 1973, 1993, and 2013 indicating how the tailings pond Talabre has grown over vegetation areas and a clear-water lagoon. The image also demonstrates a progressive decrease in vegetation in the oasis of San Francisco de Chiu Chiu. Lansat images courtesy of the US Geological Survey. Color composition and comparison: Godofredo Pereira.

Fig. 6. Normalized Difference Vegetation Index (NDVI) analysis by Jim Norton indicating a clear decrease in vegetation in San Francisco de Chiu Chiu during the last forty years. Source: Atacama Desert Project, July 2013.



In addition to this, by virtue of the fact that each material has a specific spectral signature, a spectral analysis is able to identify materials whose existence can be traced back to either human or nonhuman origins. By identifying such substances, it is possible to demonstrate the vast areas of soil affected by mining and map a reality that otherwise would have no visibility.

But the wider implications of this focus on spectral symptoms go far beyond these direct applications: since Landsat remote sensing allows the characterization of vegetation behavior over time, it expands the debate over factual details of what exists in the present into an exploration of how the present material conditions reflects a larger, wider, and much slower set of processes. In this way, the "geoforensic" perspective inherent to the spectral analysis of vegetation and minerals allows a drastic history of invisible water movements and contaminations which take place under the desert's surface to be made visible.

"Hombres Verdes"

As if the dramatic environment produced by the draining and contamination of the water table was not sufficiently challenging, toxic smoke from copper smelters, pollution from chemicals, dissolved metals or acids, and the low maintenance standards of tailing ponds and dams have resulted in decades of extensive air, soil, and groundwater contamination. It is particularly contamination by arsenic—a by-product of copper mining—that is affecting not only those in the vicinity of the Chuquicamata mine, but also populations all over Chile. One particular case is known as *los hombres verdes* ("the green men"), the name literally deriving from descriptions of workers from copper smelters who had a "gelatinous green substance" flowing from their bodies, in addition to other multiple symptoms of prolonged contamination.[17]

The case concerned the state-owned copper smelter of ENAMI/CODELCO-Ventanas in Puchuncavi, where dozens of workers have died from contamination-related diseases and hundreds more claim to be contaminated, and where the neighboring populations still inhabit today an environment whose water, soil, and air are completely saturated by the copper industry.

In a chilling list compiled by ASOFREN,[18] the number of years that workers spent in the smelter is correlated with the years they lived after retirement: the more years of work, the less years of life. This area has a higher percentage of cancer and heart-related deaths than any other in Chile. Moreover, the whole region of Puchuncavi is contaminated with massive amounts of SO_2 [19] and other potentially harmful particles suspended in the air, referred to as PM_{10} and $PM_{2.5}$.[20] An analysis conducted in 2011 recorded massive amounts of lead, arsenic, and other metals inside the classrooms in the nearby village of La Greda.[21] Toxic clouds, acid rain, and layers of toxic dust are said to be typical occurrences.



Fig. 7. Eduardo Castillo, ex-worker at the ENAMI-Ventanas copper smelter, Chile. Photo: Luis Miranda, 2011.

Given the amount of evidence available, currently a collective of widows is demanding acknowledgment of responsibility and compensation from the national copper company for the deaths of their husbands. As part of this process, between 2011 and 2013 the bodies of twenty-eight people are to be exhumed by forensic teams from SML.[22] In the cases already exhumed, forensic experts have taken bone samples of femurs, fingers, and skulls to test for the presence of arsenic, copper, or lead. While the final results of this process are still to be made public, the massive degree of contamination suffered by the workers was already evident during the exhumations: according to the families, the clothes of the deceased had become green (probably due to the slow release of arsenic from the bodies after death), and one of them had even exploded inside the coffin. It is clear that the toxic metals released from underground had circulated as transversal agents of contamination, from the body of the earth to the bodies of people. And, strangely, the image of arsenic slowly releasing itself from inside the body, rupturing the skin and changing its color is not too dissimilar from the images resulting from the remote sensing of the desert's surface, evidencing how mining excavates and transforms the earth. In this case it is the body itself that becomes the symptom and evidence of a large-scale environmental contamination.

But because copper is the main source of income in Chile, the political debate remains key to this problem, which is ultimately a question of the balance between the environmental and human consequences of mineral extraction and its economic and material profits. The appropriate responses to the growing body of evidence indicated above would be the implementation of more strict environmental monitoring and remediation processes, and a more committed stance on the application of the existing legislation, but equally the compensation of affected populations and recognition by the state that it has failed to properly take into consideration the public health implications of resource extraction.

In relation to these wider political forums, a geoforensics needs to be constituted as something more than the application of scientific expertise to legal disputes. Gesturing in this direction, NGOs have drawn attention to the fact that the large-scale exhumation procedures of the *hombres verdes* are comparable to the exhuming of remains from disappeared detainees. They made such a connection in order to raise public awareness of the unleashing of underground materials into the environment, and, more importantly, to direct attention towards the political dimension of mineral extraction, which forces people and contaminants to live together. Such a mobilization was possible not simply by focusing media attention on the testimony to people's suffering, but by circulating the data, reports, pictures, and other evidence of the mutual contaminations between people and minerals, bringing together labor and environmental disputes as manifestations of a single problem.

And indeed these matters have begun to be debated, particularly at the constitutional level. Most recent proposals of constitutional reform focus on the relation between copper and people: on the one hand the need for the mining industry's renationalization; and on the other the need for an appropriate balance between mineral extraction, environmental protection, and indigenous territorial rights. Seen together, they are suggestive of a constitutionalism from below, where "below" refers not only to the people but also to the minerals, spirits, and bones that inhabit Chile's underground.[23]

Geoglyph Talabre

The expansion of Chuquicamata's tailings pond has severely damaged a millenary geoglyph. Like other geoglyphs, this humanoid figure was traced on the desert's surface more than one thousand years ago, and cannot be seen from the ground, only from the sky. Its protection depends on satellite or aerial observation, as the traces which make it up appear from ground level, at least at first sight, no different from common truck marks. Maybe it is the Atacama that imposes the necessity of a critical distance to properly frame the scale at which events take place. But while distance allows for the enhancement of some objects, it also collapses others: from a remote sensing perspective, what are visible are not the clear-cut figures of man and nature; rather, it is their background, the vastness of the desert that, once brought into focus, registers every historical moment on its surface: events that occur in the desert, that make use of the desert, and that, indeed, take place because of the desert itself.



Fig. 8. Google Earth image of a geoglyph in close proximity to the tailings pond Talabre, demonstrating lack of appropriate protection. Image © Digital Globe, Inc., 2013. All rights reserved.

Today the Atacama reflects not only the quest for the underground frontier but also the disregard for human rights that often goes hand in hand with such territorial calculations, informing the destruction of environment and people alike. And given that the geological and climatic conditions of the desert further exacerbate the environmental violence to which its inhabitants are and have been subjected, in the current era of accelerated climatic transformation, the

Atacama has become a paradigmatic scenario: as a contemporary El Dorado it is sure to remain for the foreseeable future one of the world's most coveted mineral attractions, yet for this same reason it also will allow the tracing of the ways law and politics are coming to rearrange themselves in the face of this condition.

In this context, examples such as those I have described suggest that material evidence is gaining increasing political significance, reflecting the growth of legal disputes around environmental entanglements. Bones, soil samples, and satellite images emerge as concrete actors within a field of seemingly indiscernible forces, as objects of evidence around which territorial politics are debated. The point of political significance, however, is not these objects per se, but the emergence of a set of practices that have the ability to both expand the range of *and* single out the relevant actors within such debates: on the one hand to understand how objects that were previously separated across closed fields of research and expertise, in fact influence and contaminate one another, and on the other hand to determine relevant levels of responsibility.

These are practices that should come together under the term "geoforensics," as the mobilization of tools that focus on the translation, analysis, and visualization of the earth, whether this means the analysis of its materials or the mapping of its spaces, with the purpose of reformulating political debates around it. Only such practices can generate a broader debate around the role of the Atacama in Chile's politics, not only as a motive behind historical events such as the coup d'état of 1973, but also as a weapon that in the past forty years has inflicted a slow and almost untraceable violence upon the Chilean people.

1 Fidel Castro, transcript of speech to the miners of Chuquicamata, November 14, 1971, produced by the Department of Phonographic Versions of the Cuban Revolutionary Government, http://www.cuba.cu/gobierno/discursos/1971/esp/f141171e.html, last accessed December 2013. Translation by the author.

2 See Eugenio Garcés and Andrés Sabella, *Las ciudades del salitre: Un estudio de las oficinas salitreras en la región de Antofagasta* (Santiago: Editorial Universitaria, 1988); and Eugenio Garcés, Marcelo Apablaza, and Mauricio Townsend, *Las ciudades del cobre: Sewell, Chuquicamata, Potrerillos, El Salvador, San Lorenzo, Pabellón del Inca, Los Pelambres* (Santiago: Ediciones Universidad Católica de Chile, 2007).

3 Alonso Barros, "Tsunami en Bolivia y Perú: el terremoto y salida de mar del 9 de mayo de 1877 (Norte Grande, Chile)," *Revista Ciencias Sociales*, no. 24 (2010): 73–93.

4 It was after Bolivia became independent from Spain in 1825 that the northern part of the Atacama witnessed its first great period of expansion: due to the absence of rain, nitrates of sodium carried by groundwater were able to crystallize as water rose to the surface and evaporated. This natural presence of nitrates allowed a boom of sodium nitrate exploration during the nineteenth century that led to the appearance of hundreds of mining settlements (*salitreras*) disturbing the surface of the surrounding landscape. So important were these territories that they eventually became part of Chile, conquered from Bolivia and Peru during the War of the Pacific (1879–84)—a war that started because Bolivia imposed a ten-cent tax on each hundred pounds of nitrates exported by an industry largely controlled by Chilean and British companies. In 1891, when President José Balmaceda proposed to purchase nitrate fields from private owners so that the state could pay for land reform and health services, a civil war broke out, resulting in Balmaceda's defeat and suicide.

5 While the Comisión de Verdad y Reconciliación (Informe Rettig) mentions the nationalization of copper resources in its introduction, it does so only in passing, declaring that it was not its purpose to look deeper into the developments that led to the coup of 1973. On the other hand, the Valech report on political detainees and the tortured, does not mention resource politics at all. See "Informe de la comisión nacional de verdad y reconciliación (Informe Rettig)," April 25, 1990, http://www.ddhh.gov.cl/ddhh_rettig.html, last accessed January 2014; and National Commission on Political Imprisonment and Torture, 2003–2005, available at http://www.usip.org/publications/commission-of-inquiry-chile-03, last accessed January 2014.

6 Miguel Ballesteros Candia, "la 'operación retiro de televisores' en Calama," *El Zorro Polémico*, February 15, 2007, http://elzorropolemico.blogspot.com/2007/02/la-operacin-retiro-de-televisores-en.html.

7 Comisión de Verdad y Reconciliación (Informe Rettig) was the process of inquiry established after the return to democracy in 1991, ordered by Chilean President Patricio Aylwin, and focusing on human rights violations during the years of Pinochet's military regime. It was subsequently expanded by the Valech report on political detainees and the tortured in 2004. See note 5.

8 Servicio Médico Legal, *Memorias Programa de derechos humanos 2007–2010* (Gobierno de Chile, 2010), 107.

9 See Jorge Molina Sanhueza, "Calama: El siniestro corvo de 2 kilómetros que indica la ruta de la Caravana de la Muerte," *The Clinic*, September 3, 2013, http://www.theclinic.cl/2013/09/03/calama-el-siniestro-corvo-de-2-kilometros-que-indica-la-ruta-de-la-caravana-de-la-muerte/.

10 Nancy Yañez and Ingo Gentes, *Derechos locales sobre las aguas en chile: análisis jurídico y político para una estrategia de gestión pertinente en territorios indígenas* (Santiago de Chile: WALIR, 2005), my translation.

11 Alonso Barros and Jorge Rowlands, "El Último Oasis del Loa: Agua, Territorio y Sociedad en la Comunidad Aymara de Quillagua," San Pedro de Atacama, May 2008. (San Pedro de Atacama: May 2008).

12 The water availability in Quillagua decreased from 400 l/s in 1970 to 64 l/s in 2010. Similarly, the population decreased, from above six hundred to below one hundred in 2010. See ibid.

13 Ibid.

14 Hugo Román and Carlos Valdovinos, "Una aproximación al estudio de la contaminación del río Loa, II Región, Chile. Periodo Marzo de 1997–Febrero 2000," paper presented at "1er Simposio sobre Medio Ambiente—Gestión Ambiental e Investigación en Metales Pesados en el Norte de Chile," Antofagasta, 2000.

15 Jim Norton (GISCorps), "Atacama Desert Project-NDVI Processing Sequence and Rational," Forensic Architecture, Atacama Desert Project, June 2013, http://www.forensic-architecture.org/investigations/atacama-desert-project/.

16 As part of the process of photosynthesis, the visible (red) band of vegetation absorbs solar radiation while the near-infrared band scatters it. Landsat multispectral sensors in operation since 1973 are able to detect these differences. Applying a series of atmospheric corrections, it is possible to gain a clear picture of overall vegetation decrease and increase. This nonetheless requires findings to be validated by observation on the ground. A wider study has evidenced how the decrease in vegetation is inversely proportional to the increase of mining operations of CODELCO. See Godofredo Pereira and Alonso Barros, "El impacto del tranque talabre en la comunidad Lickanantai de San Francisco de Chiu-Chiu," Forensic Architecture, Atacama Desert Project, September 2013, http://www.forensic-architecture.org/investigations/atacama-desert-project/.

17 Luis Miranda, "El drama de los mineros contaminados de la Fundición Ventanas," *Soy Chile*, July 1, 2011, http://www.soychile.cl/santiago/temas/hombresverdes/10/16170/.

18 ASOFREN stands for Asociación de Ex Funcionarios de ENAMI (the Association of Ex-workers from ENAMI).

19 "Sulfur dioxide (SO_2) is one of a group of highly reactive gasses known as 'oxides of sulfur.' The largest sources of SO_2 emissions are from fossil fuel combustion at power plants (73%) and other industrial facilities (20%). Current scientific evidence links short-term exposures to SO_2, ranging from 5 minutes to 24 hours, with an array of adverse respiratory effects." United States Environmental Protection Agency, "Sulfur Dioxide," http://www.epa.gov/airquality/sulfurdioxide/, last accessed October 2013.

20 PM_{10} has an aerodynamic diameter that is shorter than 10 µm, whereas $PM_{2.5}$ has a diameter of less than 2.5 µm. These are organic and inorganic particles capable of entering the respiratory system. See World Health Organization, *Air quality guidelines global update 2005: particulate matter, ozone, nitrogen dioxide, and sulfur dioxide* (Copenhagen: 2006).

21 See the report by SEREMI de Salud, Región Valparaíso, *Informe análisis de metales pesados en polvo y suelos a colegios en Puchuncavi* (Valparaíso, 2011).

22 According to Mauricio Dunner from Quintero's public prosecutor's office, of these twenty-eight, twenty-one have now been exhumed. "Exhuman nueve cuerpos más de ex funcionarios Enami-Codelco para determiner su causa de muerte," *La Tercera*, June 10, 2013, http://www.latercera.com/noticia/nacional/2013/06/680-527550-9-exhuman-nueve-cuerpos-mas-de-ex-funcionarios-enamicodelco-para-determinar-su.shtml.

23 The exhumations of political leaders that have been taking place throughout South America—from Simón Bolívar in Venezuela to Salvador Allende in Chile, or João Goulart in Brazil—belong to a movement of reconstituting the political body of the state that foregrounds resource conflicts as central to South American political history. See Godofredo Pereira, "Dead Commodities," *Cabinet*, no. 43, "Forensics" (Fall 2011): 90–94.

Ehrlich's *Pharmakon*: Poison and Cure in the "therapia sterilisans magna"

Howard Caygill

Significant traces of arsenic are present in Paul Ehrlich's acceptance speech for the Nobel Prize in Physiology or Medicine of 1908 which, consistent with the genre of such prize speeches, reflected on his life's work and scientific achievements. Ehrlich's contribution was indeed enormous: he made fundamental contributions to the theory of poison, to the inauguration of modern pharmacology—the concept and description of a drug as a "magic bullet" was Ehrlich's —and perhaps most significantly to the science of immunology for which he received the Nobel Prize. He also presided over the industrialization of medical science in the late nineteenth century—carrying over into medicine and public health the pattern of state-sponsored knowledge and industrial concentration characteristic of the German chemical and dye industry.[1] His most prominent achievement, announced towards the end of the Nobel Prize speech, was the invention-discovery of Salvarsan, a chemical-arsenoid therapy for syphilis which prevailed as the most efficient if controversial treatment of the disease until the discovery of penicillin and antibiotic treatments in the 1940s.[2] Although this poison-cure was but one of the many spin-offs of Ehrlich's laboratory—which included the application of dye compounds to human and animal cells and the invention of chemotherapy—its discovery, synthesis, and application was made possible by the intellectual and industrial foundations laid by Erhlich's systematization of biomedical research on the basis of the logic of the *pharmakon*.

The controversy that surrounded Ehrlich's drug Salvarsan for the treatment of syphilis soon after its introduction in 1910 and the strategies invented to manage the public and professional anxiety provoked by the ambivalent realization that this cure might also be a poison, exemplify what Jacques Derrida later identified as the effects of the logic of the pharmakon. Derrida explored these effects through a reading of Plato's enigmatic description of writing as a pharmakon in his dialogue *Phaedrus*, using a medical term to describe it as the cure for forgetfulness that destroyed memory. From this Plato and following him Derrida drew the broader lesson of the logical ambivalence of the pharmakon—that cures are poisons and poisons are cures—which brought with it the undermining of dialectical logic and its commitment to an unequivocal result. The non-dialectical tension and movement proper



Fig. 1. Bottle of Salvarsan treatment for syphilis, London, England, 1909–1914. Source: Science Museum, London.

to the pharmakon was elegantly analyzed by Derrida in his essay "Plato's Pharmacy" in the collection *Dissemination* by means of a reflection on the inscription and trace that makes up writing. In the remarkable fourth section of the essay he leads his reflection on the pharmakon along a route already surveyed by Ehrlich, who has a spectral presence alongside Plato in this essay—moving from the concept of disease as fundamentally immunological ("the most general concept of disease should be allergy") to the introduction of the pharmakon into a context of diseased life:

> "Normal" disease demonstrates its autarky by confronting the pharmacological with *metastatic* reactions which displace the site of the disease, with the eventual result that the points of resistance are reinforced and multiplied. "Normal" disease defends itself. In thus escaping the supplementary constraints, the superadded pathogeny of the *pharmakon*, the disease continues to follow its own course.[3]

In spite of his rhetoric of the "magic bullet" the pharmakon was not just the ironic fate of Ehrlich's work, but its very element. His work in immunology and therapeutics may be described in terms of the attempt to give a cyto-architectural account of the symptomatic properties of the pharmakon, to show how and why there is a pharmakon, how and why poison is a cure and cure a poison.

Ehrlich's work inhabits the pharmakon; indeed his contributions to immunology and pharmacology ultimately made possible Derrida's later recognition of its properties in terms of immune response. He encountered its manifestations throughout his research, but most critically in his ambition of producing a dazzling exemplar of his pharmacological conviction that targeted chemical intervention at the level of the cell could provide a "magic bullet" for the cure of disease—in this case the cure of syphilis effected through selective and targeted poisoning of the responsible microbe. Ehrlich's MD thesis, "Contributions to the Theory and Practice of Histological Staining," studied the effects of chemical staining on cellular architecture and anticipated his later application of the physiological research method of ablation (the selective disabling of an organism usually by vivisection but in Ehrlich's case by chemical poisoning) to the functioning of a cell. By showing how the staining of a cell by a chemical dye selectively changed the structure of the cell he was able to hypothesize a potential therapeutic application.[4] The possibility that the selective disabling of a cell by poisoning it might have diagnostic and therapeutic applications was recognized and subsequently exploited by Ehrlich in his chemo-therapeutical investigations.

With the principle if not the name of the pharmakon already identified in his early work, Ehrlich addressed himself to its specific therapeutic application. One of the diseases he addressed was the horrific and symbolically charged sexually transmitted disease of syphilis which had arrived in Europe as a "new disease" in the late fifteenth century, carrying with it devastating

suffering and enormous mortality. An effective chemical therapy for this insidious but deadly disease—whose highly visible victims were filling the late nineteenth-century mental hospitals—would assure enormous publicity and validation for the new pharmacology. Building on his teacher Robert Koch's rules for isolating a pathogen, neutralizing it in a petri dish, and returning it to a healthy subject in order to see if it recurred and if so thus confirming its presence and operation, Ehrlich pursued a chemical poison that could neutralize the bacillus *treponema pallidum* that had recently been identified as the pathogen provoking the symptoms of syphilis. His timing was fortunate: the presence of the pathogen had been established following Koch's rules by the experiments with monkeys and rabbits of Metchnikoff and Roux in 1903 and identified by Schaudinn and Hoffman in 1905.[5] With the identification of the pathogen and other factors we shall discuss below, Ehrlich and his collaborators set themselves to discovering a chemical compound that neutralized its effects—effectively poisoning it —at the level of the cell while minimizing its own "collateral damage" on the healthy cells of the organism.

Ehrlich proceeded methodically on the basis of the early insight, even obsession, provoked by effects of the application of dyes to cells. On the one hand the dyes made visible otherwise inconspicuous features of cellular architecture—an important discovery—but on the other hand the dyes affected otherwise identical cells in different ways. What to many investigators would have seemed an irritating distortion of the cyto-structure by the dye—manifest in small chromatic differences—fascinated Ehrlich, who saw in these distortions not only a research tool but also a potential opening for chemical intervention at a cellular level. His observations were compromised by the phenomenon of poisoning or the destruction of the observed organism by the very process of observation, but this distortion pointed to other possibilities. It led in Ehrlich's case to the deduction of architectural and topological properties of the cells—receptors—that were specifically responsible for the interactions with the chemical dyes. Ehrlich thus moved from the micro-properties of the cell and its interaction with chemical agents to the properties—pathological or normal—of the populations of cells that make up the organs of the body. The cure or poisoning of the body, in other words, could be traced to functional interactions and architectural changes at the level of the cell. The therapeutic gain of these chemical and organic interactions depended on the specific properties of the pharmakon or the balance between short-term poisoning and long-term cure, itself a formula with complex variables dependent upon the qualitative changes to cellular architecture provoked by the compound along with macro-properties depending on the quantity of cells affected by the chemical compound and the rate at which they were affected.

Claude Quétel, in his fascinating history of syphilis, describes how Ehrlich moved on an empirical discovery announced in 1905 by the Liverpool scientists Thomas and Breinl. Researching sleeping sickness, Thomas and Breinl discovered that the ironically named compound "atoxyl," a sodium salt of arsenic (first reported in 1863 by Antoine Bechamp), acted on diseases known to be caused by the trypanosomiases, pathogens analogous to the syphilis treponema.[6] Arsenic was traditionally known to offer short-term alleviation to symptoms of syphilis, but was not thought to be as effective in suppressing the symptoms as the devastating mercury treatment. Ehrlich seized on the analogy between the pathogens and the effects of arsenic on the sleeping-sickness pathogen to explore the possibilities of arsenic compounds in the treatment of syphilis. He identified two linked problems with arsenic therapy: in the first, the specific case of atoxyl, the chemical compound destroyed the pathogen but at the price of destroying healthy cells—it approached the state of a pure poison; while in the second case the effectiveness of a chemical compound in neutralizing a pathogen was quickly mitigated allowing the pathogen to revive and resume its attacks on the cell, perhaps even strengthened. In the latter case Ehrlich drew on his work in immunology to hypothesize that the properties of the chemical-pathogen interaction were rapidly neutralized in a process he described as "arsenoresistance," and on this basis sought an arsenic compound that would not be so quickly neutralized. The changes to cellular architecture provoked by the pathogen had to be neutralized and this neutralization had to be as long lasting as possible but without destroying the cell itself.

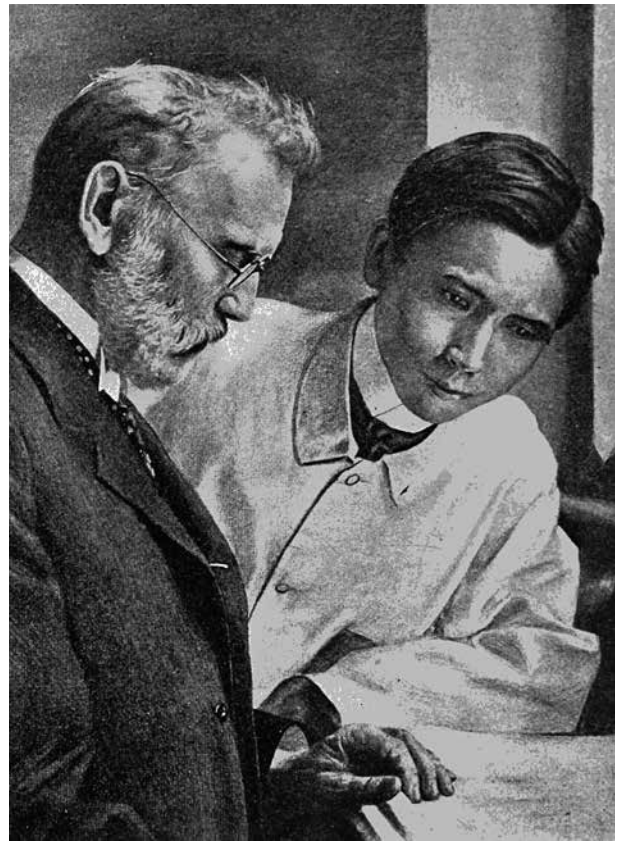


Fig. 2. Dr. Paul Ehrlich and the Japanese bacteriologist Dr. Sahachirō Hata, who worked in Ehrlich's laboratory. Source: *Popular Science Monthly*, vol. 83, October 1913.

The research consisted in a painstaking art of combination—Quétel notes that Ehrlich's motto was *Geduld*, "patience"—with the research team systematically introducing small variations into the structure of the arsenic compound—moving as we shall see from a pentavalent salt comprised of five molecules to a trivalent salt and then applying variations of these compounds sequentially to resistant strains of the pathogen. In May 1909, after persistent trial and error, variation number 606 produced the desired effect of neutralizing the pathogen in a lasting fashion. It was tested first on animal subjects and then sent to doctors for trials on humans and the results published and a patent secured in 1910 after which, and to great fanfare, it was marketed under the names Salvarsan, or simply 606.[7] The sequencing of variations continued and combination 914 was found to be more effective—that is to say less devastating in its effects and easier to administer—and was in turn marketed as Neosalvarsan. The problem, of course, was that while the compounds neutralized the pathogen they also provoked collateral damage to the cellular

architecture which was manifest somatically and given the name "side-effects." In short, Ehrlich's art of chemical combination directly addressed the problem of the ambivalent poison-cure properties of the pharmakon, seeking a compound that would maximize the toxic impact on the pathogen and its operations while minimizing the toxic effects on the host.

Ehrlich immediately came under pressure in the press and in medical and scientific literature for the alleged ineffectiveness and extreme toxicity of the drug; that is to say, for its very properties as a pharmakon. In a defense of the drug before the Reichstag in 1914, Ehrlich appealed to a calculus based on the logic of the pharmakon: "If the advantage did not far outweigh the disadvantages, I would not think for one moment of still permitting the drug to be used for treatment."[8] With such claims Ehrlich began the systematic attempt to manage the effects of the pharmakon by diverting responsibility for these effects away from the drug itself to such contingent features as the quality of the manufactured compound or the competence of the medical practitioners who administered it to patients. It was in this spirit that much of the high reported toxicity of Salvarsan was attributed to its inept administration by medical practitioners. The process of administering the drug was indeed complicated with many possibilities of fatal error. It was administered by mixing a powder taken from an ampoule with a saline solution and with sodium hydrate which was then filtered and injected intravenously. If the powder was exposed to air, it became toxic, or rather its toxicity was enhanced. If it was administered in any other form it was less toxic but—consistent with the logic of the pharmakon—also less effective.[9] The development of Neosalvarsan was a direct response to these problems of administering the drug, an attempt to adjust the terms of the logic of the pharmakon at the level of its administration. Much of the then contemporary debate surrounding the effectiveness and toxicity of the drug seems to have sought such narratives to account for its equivocal properties—its character as a pharmakon—whether in the unreliable medical administration of the drug that allowed it to oxidate or in impurities in the drug associated with different production sites. Responsibility for the ambivalent effects of the drug was rarely traced back to the foundations of Ehrlich's biomedical research and his view of disease as a product of poisoning and of therapy as the effective poisoning of the poison. These foundations, however, were stated very clearly in Ehrlich's Nobel Prize speech which referred directly and at length to the research in progress for a chemotherapeutic treatment for syphilis.

Ehrlich's 1908 Nobel Prize speech was delivered on the eve of the introduction of Salvarsan, and with it the principle of the pharmakon, to a mass public and market in 1910. It gives a report on the emergence of a powerful


DOCTORS HAVE FAITH IN EHRLICH'S '606'

Danger, All Admit, Attends Faulty Technique in Using the Blood Cure.

IT MUST ENTER THE VEINS

Fatalities Have Resulted Only Where Salvarsan Has Been Introduced Into Muscular Tissues.

Fig. 3. Headline of article in the *New York Times*, February 9, 1912. Source: New York Times Archive.

new body of biomedical knowledge and its associated therapeutic technologies born under the sign of the pharmakon. It begins with a reference to the history of the cell doctrine made possible by the microscope, pioneered by the romantic physiologists Oken and Swann, and systematized by the pathologist Virchow. The speech opens with an homage to the invention of the cell doctrine that quickly modulates into the dissolution of the concept of the unified cell "into a large number of distinct partial functions."[10] With the breakdown of the cell into its functions Ehrlich returns to another opening trope of his lecture, namely the received distinction between the biomedical disciplines of anatomy and physiology. Anatomical knowledge is visual, concerning the morphology of organs and their place within the larger structural architecture of the body, while physiological knowledge is functional, time based, and usually unavailable to direct vision. By pointing to the functional dissolution of the unit of the cell, Ehrlich seemed to be opting for the pursuit of a pure physiological inquiry, one organized around the knowledge of chemistry and chemical reactions: "The activities of a cell, however, are essentially chemical in nature, and since the formation of chemical structure is beyond the pale of visibility, it follows that we must cast about for other methods of study."[11] Yet this dissolution of the cell into a sum of temporal functions understood in terms of chemical reactions and syntheses very quickly assumed a morphological character, with Ehrlich moving from chemical groups hypothesized as active within the cells to the morphological features corresponding to them and potentially visible, if indirectly, to the new discipline of physio-anatomy. The move from chemical reactions taking place over time to specific features of cellular architecture that correspond to them is accomplished in the speech with great rapidity and without extended reflection. Ehrlich first reports, "I am convinced that it has been proven conclusively that the cells contain definite chemical groups which bind the poison,"[12] and then moves to describe these groups in terms of a structural property of the cell, using the pointed metaphor—if that is what it is —of "the key and the lock."

Before arriving at the transformation of the conditions of possibility for a chemical reaction into a morphological characteristic of the cell Ehrlich reports an important methodological step towards the understanding of otherwise invisible chemical processes. This is the property of specific poisons—"toxins"—capable of provoking the production of antitoxins by the host cell. From the discovery that toxins continued to provoke the production of antitoxins even after neutralizing their toxicity by heat or dilution, Ehrlich inferred the existence of a morphological property or "haptophore" of the toxic cell that continued to bind with complementary properties of the host cell even after its toxicity had been neutralized. He further deduced the existence of complementary properties of the host cell or "toxophores" which had been diverted from their normal function: the chemo-structural properties of the cell—what he calls "receptors," that were "really designed to chemically bind normal metabolic products" and are in this case transformed into

"poison catchers."[13] These provoke the cell in some circumstances to cast off the compromised receptors manifest as "antitoxins." This magnitude of this discarding of compromised receptors seemed to be out of all proportion to the scale of the attack, leading Ehrlich to hypothesize a "hyperregeneration" of the cell and to look for indirect methods for the immune suppression of invasive pathogens.

The model of the poisoning of the cell and the stimulation of the production of antitoxins discarded by the cell and released into the bloodstream was above all of methodological significance for Ehrlich, even though he admits that it also had "significance in the forensic diagnosis of blood."[14] By provoking the accumulation of rejected, compromised receptors into the bloodstream it becomes possible to deduce the functional architecture of the cell—its array of receptors—from its discarded elements. Ehrlich was well aware of the implications of his method for cellular physiology: while not claiming to solve "the mystery of life" he does go so far as to suggest that by "comparing the latter to the complex structure of a mechanical apparatus, we might say that we are at least able to take out some of the wheels and study them minutely. This is certainly a great advance over the former method—to smash the entire apparatus and then hope to learn something from the mass of fragments."[15] The reverse deduction of structural properties of the cell from its discarded receptors allows Ehrlich to propose three groups of receptors: those which are not rejected by the cell, "normal" receptors "involved in the very simplest functions, as, for example, the absorption of simple fats and sugars"; those which are rejected into the bloodstream "forming characteristic antibodies";[16] and those in which "instead of regeneration, there is a *disappearance* of receptors,"[17] a property Ehrlich identified as "immunity."

In the creation of a new scientific method of physio-anatomy that combined the structural analysis of anatomy with the functional analysis of physiology Ehrlich brought himself into close proximity with the pharmakon. By understanding disease according to the model of poisoning, and by privileging the analysis of toxins, toxoids, and antitoxins, Ehrlich rephrased the health and sickness of the cell and by extension the population of cells that constituted the organism in terms of poison and cure. Health consists in not being poisoned. With this method established he turns to the latter part of his Nobel Prize lecture that offers an extended account of his work in progress on the trypanosomes, whose pathological action is understood according to the model of a poison. His research into the toxic action of the trypanosomes was conducted in terms of the third group of cellular receptor action, namely those that disappeared with the attack by the toxin. Ehrlich and his research group discovered the phenomenon of resistance —that certain trypanosomes survived the defensive actions of the cell in eliminating the receptors that rendered them vulnerable to attack, and adapted their structure to different receptors, thus resuming their attack on the cell and the organism: "We are dealing, therefore, with a typical case of the disappearance of receptors following immunization, and accompanied by the formation of an entirely new variety of receptor."[18] With this realization Ehrlich begins to vindicate a claim made seemingly in passing at the outset of his lecture, namely that the understanding of the vital, chemical properties of the cell "constitutes the basis of a truly rational use of drugs."[19] The rationality at work in the "magic bullet" is revealed to be that of the pharmakon, or quite literally, of knowing how to poison the poison.

Ehrlich's research group turned their attention to inquiring into "what manner the trypanosome antibodies affected the parasites."[20] What was the specific action of the antibody understood at the level of cellular and intra-cellular function? Ehrlich's group discovered that the poisoning of the poison in this case occurred indirectly: the antibodies did not bind with the parasite cell in a way that assured "injury or even destruction of the latter."[21] Rather, the antibodies bound to the nutritional receptors of the trypanosome, blocking their access to nutrition, and allowing Ehrlich to identify a type of antibody he called "atrepsins." This indirect poisoning of the microbe by blocking its nutritional receptors varied according to the number of antibodies—if these were insufficient to shut all the nutritional channels of all the microbes then the surviving microbes would mutate and develop new nutritive channels. With this Ehrlich and his team had discovered the workings of the pharmakon, or the objective of poisoning the poison with sufficient vigor to prevent the emergence of mutant, resistant strains. Unfortunately this objective of curing by means of poisoning the poison could also entail the poisoning of healthy cells and indeed the entire organism. What was required was a precisely targeted poison that would affect only the pathogens, or poisonous cells, and to a degree that would assure the survival of the organism.



Fig. 4. Poster for William Dieterle, dir., *Dr. Ehrlich's Magic Bullet*, starring Edward G. Robinson (USA, 1940), 103 min.

Ehrlich closes his lectures with an account of his work with the three groups of "trepanocydal" poisons, that is to say, of the poisons capable of poisoning the poison: the first and most significant are substances of the arsenic group, followed by fuchsin and the acid trypan red. In his pursuit of a trypanocidal chemical agent (and ultimately a cure for syphilis) Ehrlich chose to work with a strain of trypanosomes that were resistant to all three forms of poison, a "triple-fast strain" that "acts as a kind of cibrium therapeuticum"—any poison effective against this strain would thus "represent a new type of trypanocidal agent."[22] Ehrlich relates how he followed the atoxyl clue provided by Thomas and Breinl in 1905, discovering that the pentavalent

arsenic atoxyl had no trypanocidal effects in the test tube, but when broken down in the body the arsenic adopts trivalent properties which were indeed trypanocidal and attached themselves to "arsenic receptors" on the microbe. Ehrlich then turns to the emergence of "arsenic fast" strains in "practical therapeutics in man and animals" or the pharmacological phenomenon of poisons gaining resistance against their poisons. The first object of research was a trypanocidal poison that could overcome the microbe's elimination of its arsenic receptors, rendering it immune to arsenic poisoning. He describes one such agent, arsenophenylglycin, as laying "hold of what is left of the arsenic receptor, somewhat as a stump is grasped by a pair of pliers,"[23] which is to say that the scar or stump of the eliminated receptor can serve as an "anchor" for the poison. This solution to the problem of a poison gaining resistance to poisons encounters the further problem of how to manage the effect of the poison on other cells in the body apart from the invading toxins. The poison that eliminates the poison can also by the same logic poison healthy cells. The toxic effect of substances such as tartar emetic and arsenious acid on the organism meant that it was necessary "to proceed indirectly" following a path that avoided the mutation of resistant strains of the trypanosome or "relapse" as well the poisoning of the host organism.

Ehrlich concludes his lecture poised between cure and poison: the poisoning of the poison must be sufficient to prevent the survival and reproduction of resistant strains, with the familiar pattern of temporary cure and remission—but not so high as fatally to compromise the architecture of healthy cells and their function and so poison the entire organism. Nevertheless, despite this delicate poise the speech ends on a high utopian note:

> My object has been to show you that we are gradually approaching the problem of securing an insight into the nature of the action of drugs. I hope too that the systematic application of the views I have here presented will facilitate a rational development of the science of drug synthesis. In this connection I may say that thus far arsenophenylglycin has proven in animal experiments to be a truly ideal therapeutic agent. By the aid of this substance it is possible to completely cure every kind of trypanosomic infection in any kind of animal, and that by means of a single injection. Truly, such a result may be termed *therapia sterilisans magna*.[24]

This is a manifesto of the pharmacological revolution, one which emerged from the predicament of the pharmakon but which—and Derrida would say necessarily—later succumbed to its logic. Salvarsan had to be succeeded by Neosalvarsan and eventually superseded altogether when a family of drugs with a more favorable ratio between poisoning the poison and poisoning the organism emerged with antibiotics. What remains fascinating though is how Ehrlich moves from the somatic predicament of the pharmakon to the study of its micro-properties, to the cell, then its functions, and then to features of intracellular architecture. And it is in the course of this inquiry that he first reveals the intersection of the spatial properties of the architecture of the cell with functional temporal features of its chemical action and then generalizes this microanalysis into an account of changes in the cell population provoked by toxicity, whether of the poisonous microbe or of the poisons used to poison it. The logical properties of the pharmakon—cure by poisoning the poison—are in this way given a microbiological account which binds together the functional architecture of cells, the temporal character of their interactions, and the emergence of the macrophenomena of resistance and immunity.

1 For the broader social and political context of Ehrlich's contribution see Fritz Stern, *Einstein's German World* (Princeton, NJ: Princeton University Press, 1999).

2 Ehrlich entered popular culture as the adversary of therapeutic nihilism in the face of syphilis with Edward G. Robinson's performance in the 1942 Warner Brothers film *Dr. Ehrlich Magic Bullet,* dir. William Dieterle (USA, 103 min.), in which Robinson plays Ehrlich in the throes of the discovery of Salvarsan.

3 Jacques Derrida, "Plato's Pharmacy," in *Dissemination*, trans. Barbara Johnson (London: The Athlone Press, 1981), 61–171, at 101.

4 This technique was crucial for the development of cytological research in the late nineteenth century and consummately realized in the work of Camilio Golgi in staining and so revealing the cellular architecture of the neuron, a technique subsequently developed by the neurologist Ramon y Cajal and still in use.

5 See the fascinating and informative thesis by Nicholas Lloyd, "A Reinvestigation of Salvarsan and Related Arsenic Chemistry," PhD diss., University of Waikato, New Zealand, 2011, at 41.

6 Claude Quétel, *The History of Syphilis*, trans. Judith Braddock and Brian Pike (Baltimore: Johns Hopkins University Press, 1992), 142.

7 Lloyd cites the *British Medical Journal* observation that Ehrlich and Sahachirō Hata (a Japanese bacteriologist working in Ehrlich's laboratory) "showed much shrewdness in calling this substance '606' since the mystery that surrounds this term in the eyes of the public has made people anxious to find out something about the substance which it notes." Lloyd, "A Reinvestigation of Salvarsan," 65.

8 Ehrlich, cited in Lloyd, "A Reinvestigation of Salvarsan," 66.

9 Ibid., 67–68.

10 Paul Ehrlich, "On Immunity with Special Reference to Cell Life," trans. Charles Bolduan, in *German Essays on Science in the 19th Century*, ed. Wolfgang Schirmacher (New York: Continuum, 1996), 90–107, at 91.

11 Ibid.

12 Ibid., 93.

13 Ibid.

14 Ibid., 96.

15 Ibid.

16 Ibid.

17 Ibid., 97.

18 Ibid., 98.

19 Ibid., 91.

20 Ibid., 99.

21 Ibid.

22 Ibid., 102.

23 Ibid., 104.

24 Ibid., 107.

The Toxic House

Nabil Ahmed

This essay deals with the complex mixture of legal, political, and scientific problems posed by cases of arsenic poisoning. Few substances have been as challenging for the fields of chemistry, environmental geology, toxicology, and criminology as arsenic, while the scientific, cultural, and legal understanding of arsenic poisoning has foregrounded questions crucial to the contemporary conception and politics of causality, liability, and redress.

Two modes of arsenic poisoning are to be considered here: its intentional use as a murder weapon, largely prior to the development of effective forensic tests for the element in the late nineteenth century, and its lethal effects as an environmental poison, in more recent and ongoing cases. Though in legal and moral terms these may seem like two disparate forms of lethality belonging to different historical periods, the role of arsenic as a Victorian murder weapon may inform and problematize several aspects of the contemporary cases of ecological violence. The difficulty of detecting arsenic, which made it a popular choice of murder weapon in the nineteenth century (frequently referred to as the "invisible killer"), is reflected and complicated in the problems faced in attempting to establish its role in twentieth- and twenty-first-century cases of environmental poisoning. Indeed, the exponential increase in the use of arsenic in the Victorian domestic space (e.g., as a green pigment in wallpaper and fabric dyes), resulting from its production as a by-product of copper mining, meant that arsenic was already involved in environmental poisonings even during that period—a fact which confused and complicated toxicological investigations in criminal cases. Where earlier murder trials for arsenic poisoning needed to demonstrate not only intent but a direct causal link between actions and their purported violent effects, separating them from possible environmental factors, it is precisely such indirect causal elements that need to be accounted for in order to demonstrate criminal liability in cases of modern ecological violence. This necessitates ways of understanding, and assembling into the form of evidence, a diffused plurality of multivalent factors in order to demonstrate non linear, yet nevertheless criminally prosecutable forms of causality: the same complications that may be used to obfuscate claims of guilt in a murder case become the focus and potential source of incrimination in modern cases of environmental arsenic poisoning.

Following an exploration of its nineteenth-century history, this essay will discuss two contemporary cases of arsenic poisoning affecting larger ecosystems in which issues around climate change and global resource exploitation are at stake—one in Bangladesh and the other in West Papua, Indonesia. These poisonings will help articulate the new ways in which science, politics, and law have come to construct ideas of responsibility and accountability; as such, their examination has implications for such issues in the wider context of pollution more generally as an increasingly serious threat to the planet's ecological future.

Victorian Chemistry

> For me chemistry represented an indefinite cloud of future potentials, which enveloped my life to come in black volutes torn by fiery flashes, like those, which had hidden Mount Sinai. Like Moses, from that cloud I expected my law, the principle order in me, around me, and in the world.
> — Primo Levi[1]



Fig. 1. Longwood House, Residence of Napoleon Bonaparte during his exile on Saint Helena. Photo: Edmund Allenby. Image courtesy of Liddell Hart Centre for Military Archives, King's College London.

Consider the properties of arsenic, which made it so potent as a lethal poison: tasteless, colorless, and odorless. It leaves no trace of itself, making it the perfect murder weapon. Its efficacy is further enhanced by its ready availability: in Victorian England it was widely used as a preservative as well as in a range of household objects.[2] The task of forensic science was to make this invisible poison visible in order to prove beyond reasonable doubt that it had been employed as a murder weapon. Yet due to its mass consumption it formed part of the environment of Victorian social life—in a way which both metaphorically and literally anticipates its environmental impact in today's global society. In *Venomous Earth*, Andrew Meharg argues that Victorian Britain was the space/time of the world's first mass poisoning, well before modern Bangladesh.[3] While science succeeded in capturing the poison through the technical practice of toxicology, it was nevertheless often difficult to prove causality precisely because murders and assassinations with poison took place against a background of an environment saturated with toxicity, for example through the abundant and unchecked use of arsenic in the dyes used for wallpaper and interior architecture.

In Western jurisprudence the *corpus delicti* (the body of a crime) refers to the principle that a crime must be proven to have occurred before a person can be convicted of committing that crime. Most often invoked in murder investigations, the best evidence for establishing crime is the body of the deceased and the cause of death. In this sense the term also describes the evidence that proves that a crime has been committed. In England up until the end of the nineteenth century, establishing corpus delicti for murder by poisoning, in which arsenic was typically used, was particularly contentious

despite the chemical's lethal toxicity. I consider the difficulties faced by forensic toxicology in the nineteenth century to anticipate the contemporary dilemma faced by forensic architecture in attempting to establish the earth itself as corpus delicti.

During the industrial revolution, tin and copper mines in the southwest of England produced half of the world's arsenic, facilitating its widespread domestic-homicidal use. The popularization of the poison as an instrument of murder and its use in industrial process went hand in hand. Arsenic was the perfect example of a *pharmakon*—a thing that is at the same time a poison and a remedy, simultaneously the cure or the illness and its causes.[4] As a geological agent, its study helped shape the science of toxicology and even the legal adversarial process. In establishing proof for a substance that went easily undetected not only were new forms of chemical analysis required, but the ability of the expert toxicologist to convince a scientifically untrained criminal court became crucial.

In 1832, British police arrested John Bodle, alleging that he had murdered his grandfather by poisoning his coffee. James Marsh, an English chemist, was brought in as an expert witness. He tested the coffee in his laboratory, and confirmed the presence of arsenic by producing a yellow precipitate of arsenic sulfide. But by the time of trial, the precipitate had entirely disappeared. Due to lack of evidence, Bodle was acquitted. Feeling betrayed by the verdict, especially when Bodle later admitted to murder after emigrating to Australia, Marsh devised a test that could better stand up in court. Known as the Marsh Test, his new apparatus not only detected minute traces of arsenic but also measured the quantity in the form of a silvery-black deposit.[5]

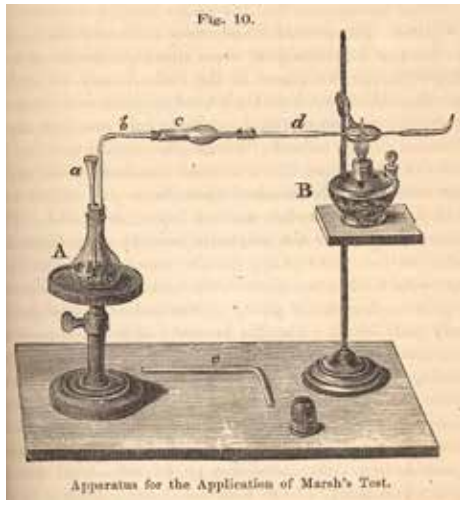


Fig. 2. Marsh Test Apparatus, Steel engraving, 1867. Theodore G. Wormeley, M.D., "Microchemistry of Poisons, including their Physiological, Pathological, and Legal Relations," New York, National Library of Medicine. Image courtesy of National Library of Medicine.

Results from the Marsh Test were the first applications of forensic toxicology to be used as evidence in court, in the Lafarge incident, which took place in France in 1840. Mary Lafarge was charged with poisoning her husband Charles Lafarge with arsenic. The case received much media attention in Paris, where Mme. Lafarge was widely regarded as innocent by a sympathetic public. During the courtroom trials several toxicologists were brought in, yet none could show conclusively that arsenic had been the instrument of murder. Finally the prosecution called for Mathieu Joseph Bonaventure Orfila, considered to be the father of toxicology, to intervene.[6] Orfila performed the Marsh Test by drawing blood from the corpse in a makeshift laboratory next to the courtroom. Claiming that the previous toxicologists had not performed the tests correctly, he found arsenic in Charles Lafarge's gut. Mary Lafarge was hanged.

Forensic science seemed to have finally caught up with the poison and the poisoner. In 1851, English courts passed the Arsenic Act, the first attempt to regulate the sale of the chemical. Measures such as requiring that arsenic, until then usually white, be mixed with equal parts indigo were designed to ensure that arsenic would no longer resemble sugar, flour, and similar substances. However, the widespread use of arsenic in nineteenth-century Britain presented a far more sinister predicament for the judiciary. Meharg quotes an 1860 edition of *The Lancet*:

> To subject men, women, and children to the ingestion of arsenic, by living in an arsenical atmosphere, may at the moment frustrate the aim of justice in the charge of homicidal poisoning.[7]



Fig. 3. "Trellis." First wallpaper design by William Morris in 1864, This particular sample was tested for arsenic content by Andrew Meharg, Queens University Belfast. Image courtesy of Andrew Meharg.

The first mass poisoning of a population with arsenic was in Victorian Britain, where the amounts ingested were greater and the concentrations higher than in contemporary Bangladesh.

Arsenic was the key ingredient in bringing a luscious, Technicolor hue to various pigments of green in Victorian Britain. Developed by the prodigious Swedish chemist Karl Scheele, copper arsenite or "Scheele's green" and chemically similar dyes were widely used in wallpapers throughout Britain. These were cheap and widely available due to both mass-production techniques and large-scale arsenic mining. The color of prosperity in Britain was a macabre green—the color of money—laced with arsenic. Meharg estimates wallpapers contained twenty-five to thirty grams of arsenic per square meter and by 1858 around 260 million square kilometers of arsenic-laced wallpaper marked the interior architecture of Victorian homes.[8] The cure for the dull interior walls of middle-class Victorian homes was a poison in disguise.

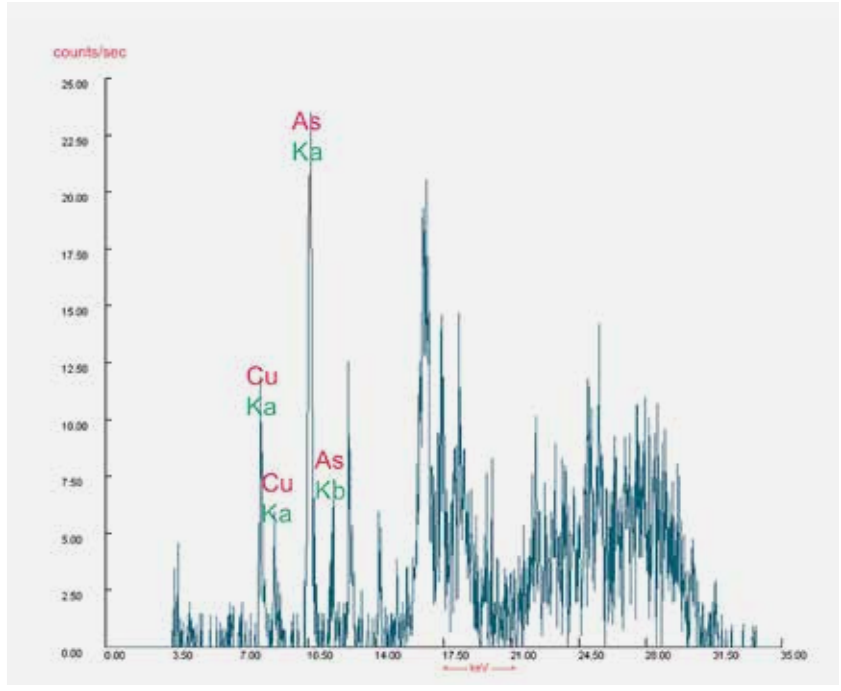


Fig. 4. Mass Spectrometry analysis showing trace quantities of arsenic in the sample of Trellis wallpaper. Credit: Andrew Meharg.

The "arsenical atmosphere" inside Victorian houses resulted from the combination of damp and wallpaper, which produced arsenic gas. The Victorian house was a toxic house. Along with the development of new toxicological detection technologies such as the Marsh Test came new techniques of legal argumentation. For example, the "Styrian defense" countered the toxicologist's proof of an accused individual's guilt by claiming that the poisoning could have been environmental. The indigenous people of Styria, a mountainous region in Austria, were known to have an unusual resistance to arsenic. In fact they regularly took high doses of the stuff to improve their appearance and strength, and through this practice had apparently acquired a degree of immunity to the notorious poison. The story of the Styrian arsenic eaters was sensationalized in the Victorian press and used by cunning defense lawyers in relation to the toxic house, compelling jurists to take into account the possibility that an alleged murder victim might have self-administered arsenic through their wallpaper, tonic, or cosmetics.

Under the Styrian defense questions facing juries were threefold: was the killing intentional; had the victim poisoned him/herself; or was it a product of an immersive poisoned environment? In my view, unlike homicide, environmental poisoning seemed to have neither motive nor intent. As the entire interior became a toxic depository, buildings were not just the locations of crimes, but rather the instruments of killing. This is very different from a case of a poisoning in which it could be clearly established that the cause of death was arsenic and that only the accused could have had the means to administer a lethal dose. When material evidence such as the Marsh Test could not determine responsibility, it was feasibly the rhetorical skill of the prosecution and the toxicologist that played the pivotal role in producing the final verdict.

The problem of the toxic house may have also been responsible for unsolved murders and mysterious deaths. Here the speculation around the political poisoning of Napoleon Bonaparte is worthy of mention. Forensic analysis of his corpse found a higher-than-average concentration of arsenic. The interior of Longwood House in St. Helena where he was exiled was covered in arsenic green. Did his enemies slowly poison him, or was it the house that killed him? I imagine the damp humidity of a tropical island reacting with the wallpaper, releasing trails of green, arsenic gas inching towards an unsuspecting Napoleon.

The legal challenge posed by the toxic house in the Victorian era can be extended to larger territories, particularly within north-south power asymmetries. The two case studies of territorial poisoning that follow are examples of what Rob Nixon has called "the long emergencies of slow violence" under neoliberal globalization in the Global South.[9] The stories unfold how I understand the problem of the toxic house, which constitutes a spatial, legal entanglement of environmental and intentional violence, to have expanded to the scale of a toxic planet.

Fig. 5. Detailed map of the Ajkwa River Tailing Deposition Area from the Grasberg Mine, West Papua. Landsat 8 false color band composition: 5, 6, 2, 2013. Image: Nabil Ahmed/Joseph Davis/ Godofredo Pereira.

Earthly Poison

The first large-scale groundwater arsenic poisoning was the result of a botched UN development project in the present-day Bengal Delta. Arsenic spread from the territory into the bodies of the victims over a long period of time. The slow diffusion of the chemical across a large area makes it hard

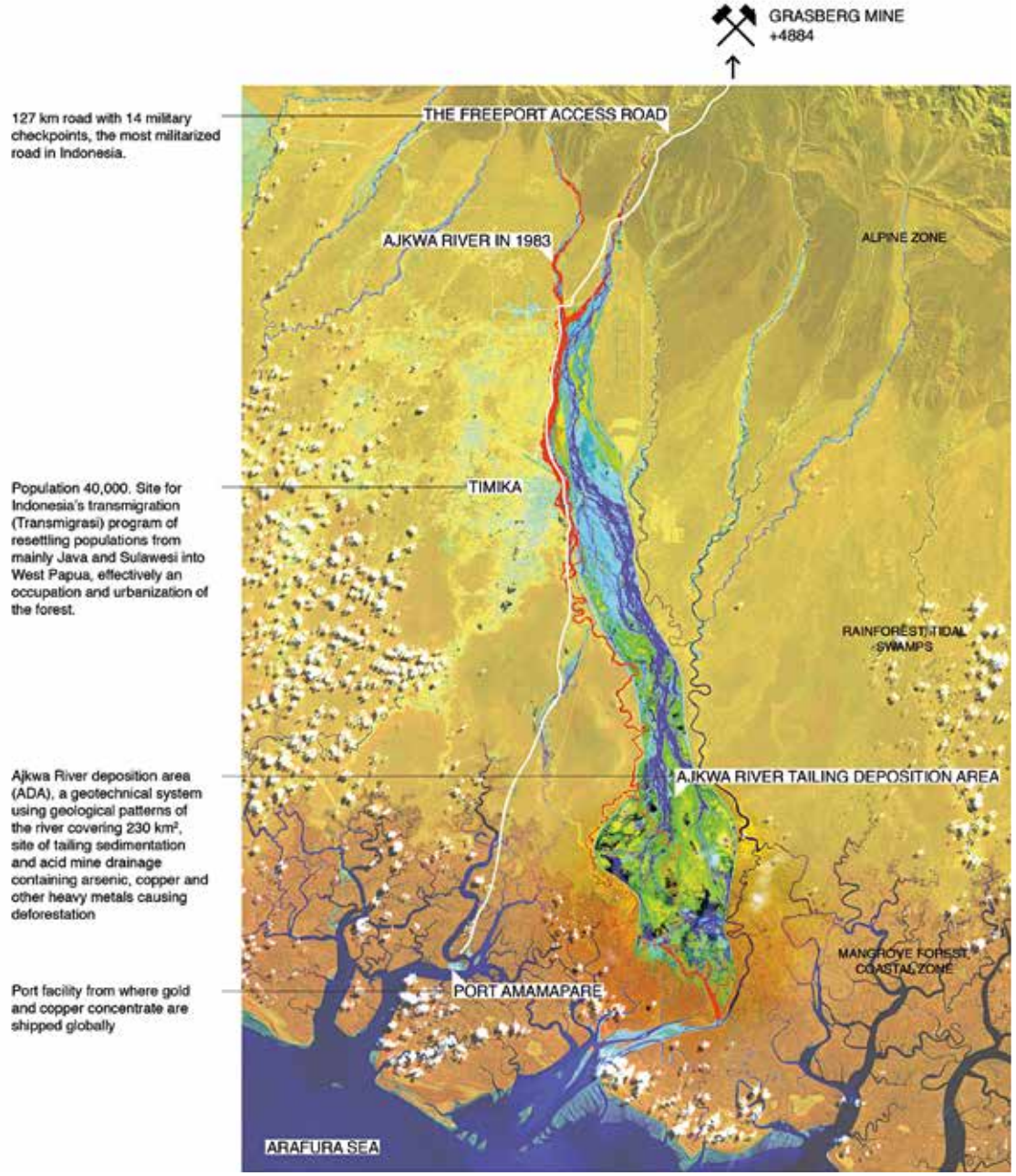




Fig. 6. President Yahya Khan in a helicopter inspecting the aftermath of Bhola, November 15, 1970 in *Doinik Purbodesh*. Original image from the daily newspaper Doinik Purbodesh. Original photographer unknown. Photographed at the National Archives of Bangladesh. Photo: Nabil Ahmed.

to attribute responsibility, or even calculate an exact number of victims, the majority of whom are among the region's populous rural poor. In what follows I will discuss the only legal case that has tried to hold international actors liable for this slow environmental disaster. It is a little known toxic tort brought by NGOs on behalf of Binod Sutradhar, a Bangladeshi villager, against British geologists who, in undertaking a survey to test the safety of groundwater to be used as a source for drinking water, had failed to test for arsenic.[10] The villagers lost the case and the rural poor in the region still drink water polluted with arsenic.

In the National Archives of Bangladesh I found a newspaper photograph of Yahya Khan, military dictator and president of East and West Pakistan. Taken days after the Bhola cyclone in November 1970, the photograph shows the president wearing aviator sunglasses and gazing through his helicopter window at the devastation below. As the incumbent president, it was Yahya Khan's job to provide humanitarian assistance to the survivors of the most devastating cyclone recorded in human history. This was an individual who just months later would order the mass killing of the same people he was responsible for protecting, beginning with Operation Searchlight on March 25, 1971.

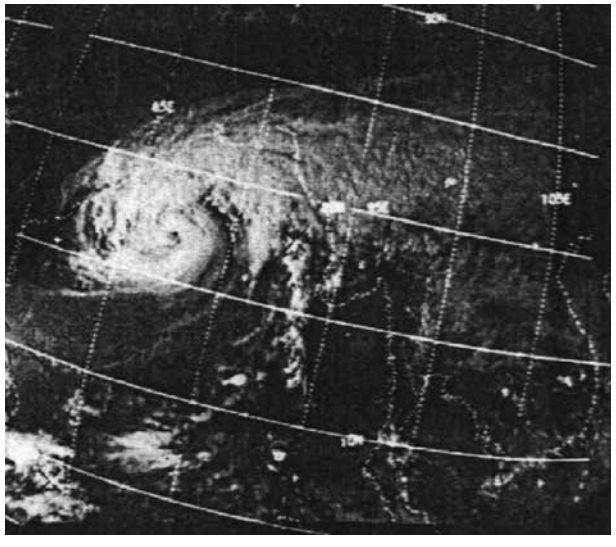


Fig. 7. Bhola cyclone, November 11, 1970. Satellite image: National Oceanic and Atmospheric Administration.

On November 11, 1970, six hundred kilometers from the port city of Chittagong, a low-pressure zone that had formed in the south and adjoining central Bay of Bengal on the morning of November 8 intensified into a severe cyclonic storm. Taking a northeasterly course, it crossed the coast of East Pakistan during the night of November 12. As the storm made landfall in the Barisal and Khulna districts, it caused a seven-meter-high storm surge.

A population of at least three hundred thousand along the coastal areas drowned in their sleep in one of the most devastating natural disasters in history. In the following days and weeks the humanitarian efforts of the ruling government in West Pakistan were heavily criticized for their mismanagement of relief funds and their sluggish response to the disaster.[11] Deciding to hold general elections in the final weeks of 1970 was equivalent to political suicide for the governing party in Pakistan, as it allowed the Awami League, the main opposition populist party in East Pakistan, to win a landslide victory. As both an extreme weather event that took so many lives and a rallying call for unity against a brutal regime, the cyclone provided the critical mass for a social-political movement for self-determination. The military rulers of Pakistan refused to give up power to the democratically elected party, which now held a majority in both parliaments, leading to a war for liberation and genocide perpetrated by the Pakistani armed forces and their Bengali-Islamist collaborators.[12] It would take over forty years to bring some of the perpetrators to justice in the war-crimes tribunal convened by Bangladesh in 2010.

The immediate effects of the independence war of 1971 were devastating. Major infrastructures were destroyed; the newly formed government led by Sheikh Mujib faced the difficult tasks of feeding a population and getting itself recognized within the global political economy.

As in many other countries undergoing decolonization, development became a key aim of the government.[13] This entailed, among other projects, the implementation of the Green Revolution, the neo-colonial program of introducing high-yield monocrops to developing countries, whereby the developing state was required to employ modern irrigation, and buy pesticides and synthetic nitrogen fertilizers, thus opening up new markets for northern seed and chemical companies. In Bangladesh, groundwater irrigation was a new technology in which the World Bank invested heavily because high-yield monocrops require five times more water, thus increasing groundwater consumption. This intervention increased the country's rice-production output in line with other countries undergoing a green revolution.



Fig. 8. Still from Nabil Ahmed, *Radical Meteorology*, 3-channel video (2013), 3 min. 46 secs., 4 min. 12 secs., 5 min. 53 secs.

Against the backdrop of this agricultural shift, UNICEF developed a major groundwater project to reduce the number of child mortalities due to drinking polluted surface water. In 1974, UNICEF, in collaboration with the Department of Public Health and Engineering, sank nine hundred thousand hand-pump wells starting in the center and south of the country.

This was an early example of the kind of forced environmentalism that did not take into account local geology. Water was not tested to see whether it might have pollutants. No pilot projects were carried out. Such large-scale public health intervention without public consultation or tests would be unthinkable in the Global North. Where the water infrastructure of the state was not horizontally connected through reservoirs and pipelines, forces of development dug vertically to tap water beneath the earth. Nevertheless, over the next two decades the program was considered a major humanitarian success for the international agency, as child mortality rates decreased. As a result, sinking tube wells for drinking water became the norm, and approximately three million more wells were either sunk privately or financed by various aid agencies. The phenomenon created a thriving village economy around vendors, installers, and producers of PVC pipes, cylinders, piston valves, and other materials required for this type of construction.

It is currently estimated that tube wells in Bangladesh number 8.6 million. Of those, 55 percent have been tested for arsenic, resulting in 3.3 million wells being marked green (safe) and 1.4 million marked red (unsafe).[14] That still leaves almost four million wells that have yet to be tested—a staggering number, especially considering the number of people using water from them. Moreover, the concentration of arsenic in unsafe wells is higher than the safe limits given in both medical and legal-scientific definitions—25 percent have more than 50 µg/L arsenic concentration (the national limit), while 50 percent have surpassed the limit of 10 µg/L set by the World Health Organization that was legalized in the United States and Europe. This difference of 40 µg/L between the nationally and internationally accepted levels itself highlights the disparity between the Global North and the Global South, articulated in the double standards of the WHO, an organization that is supposed to be concerned with international public health and "health for all."

For the past three decades, 35–77 million people out of a population of 125 million have been drinking polluted water. The crisis in Bangladesh is considered to be the largest chemical mass-poisoning on the planet—worse than Chernobyl and Bhopal combined. Furthermore, it lacks the spectacular disaster narrative which such names evoke. This environmental poisoning had neither intent nor motive. Though arsenic in groundwater had been detected as early as 1984 it would be decades until any attempt at legal redress was made. *Sutradhar v. National Environmental Research Council*, the legal case that tried to bring justice to the victims of this poisoning on a territorial scale, produced alliances between Bangladeshi NGOs and the sophisticated legal process of tort law. In 2004, several NGOs launched a legal case against the National Environment Research Council (NERC), the parent body of the British Geological Society, on behalf of Binod Sutradhar, a villager from Ramrail village, Brahamanbaria district (located northeast of the capital Dhaka). The leading NGOs were Brotee and Bangladesh Legal Aid and Services Trust (BLAST) and later Dhaka Community Hospital.



Fig. 9. Mrs. Sutradhar showing advanced keratosis from arsenic poisoning, Ramrail village, Brahmanbaria, Bangladesh, July 2013. Photo: Nabil Ahmed.

Fig. 10. Table showing quantity of arsenic in Binod Sutradhar's immediate neighborhood at present, Ramrail Village, Brahmanbaria, Bangladesh, July 2012. Credit: Nabil Ahmed/Forensic Architecture.*Parts per billion

Well owner	Depth (Feet)	As (ppb)*	Year of Installation	Number of users
Haripad Debnath	200	0.722	2002	6
Bishonbor Debnath	170	0.232	1990	12
Poritosh Debnath	205	0.23	1995	6
Shanjit Debnath	180	1.594	2010	7
Kanailal Sutradhar	200	0.042	2007	15
Gaurago Sutradhar	150	0.046	1995	15
Rashiklal Debnath	180	0.003	1990	12
Shantosh Debnath	300	0.082	1993	300
Mahfuz	180	0.018	2013	10
Dulal Debnath	165	0.003	2010	5

In 1992 the British Geological Society had tested the well water in Sutradhar's village for toxicity but failed to test for arsenic. The report, titled *Hydrochemical Character of the Main Aquifer Units of Central and Northeastern Bangladesh and Possible Toxicity of Groundwater to Fish and Humans*, made no mention of arsenic.[15] The claim centered on this report and how it was used as a policy document by the state, thus making it a key factor leading to Sutradhar drinking polluted water for years and developing an arsenic-related illness. Leigh Day & Co., a UK-based law firm, approached Brotee with the idea of a toxic tort, a type of case in which they had significant expertise. Rather than the UN or the State, the case implicated geologists as negligent in the duty of care they owed Sutradhar. At that time there had been no previous litigation based on the culpability of a scientific institution that had produced flawed technical reports while working on a development project.

In 2006, in a court of appeal at the House of Lords, Leigh Day lost the case when the judges decided that the proximity between the plaintiffs and the British Geological Society was so remote that no duty of care could arise. This is the opposite of a view of globalization that is seen as characterized by the diminishing of the distance between the local and the global. Proximity and responsibility become political terms where, in certain cases, humanitarian actors in the North cannot be held responsible for their actions when these bring harm to the very people they are trying to protect. Although with the proviso that it was the minority judgment, one of the three judges drew attention to the point made in the expert witness statement of Dr. Sara Bennett, a Canadian environmental specialist consulting on Bangladesh's Northeast Regional Water Management Plan, which stated that the government of Bangladesh relies heavily upon foreign organizations for data gathering and analysis, implying that the 1992 report would have been in close associative proximity with their decision making processes.

I was interested to find out how a poor Bangladeshi villager was able to take a major Northern scientific institution to court over actions which it claimed were intended to foster development rather than to advance scientific knowledge. Forensic science is not neutral, in that it follows the imperative of using reason to prove the guilt of the supposed perpetrator of a crime. Similarly science in the service of development is caught up with the politics

of development, which are also not neutral, but rather entangled in webs of bilateral agreements, the neoliberal dictates of the donor countries and the World Bank, and various strategies for coercing and generating profit. The transfer of capital, technology, and expertise has in general flowed unidirectionally from north to south. Within this uneven matrix of power, what influence can a single villager in Bangladesh have?

In attempting to provide an answer we can begin with the history of the World Bank, an institution whose work is supposed to benefit villagers like Binod Sutradhar. Michael Goldman, in his book *Imperial Nature,* writes how Robert McNamara, head of the World Bank from 1968 to 1981, had made the reduction of poverty and development of the rural peasantry in the third world his top priority.[16] His knowledge of the third-world rural peasantry was shaped by his previous job as Secretary of Defense during the Vietnam War. From that experience he understood that the World Bank had to diversify its loan program to include financing development projects targeted to the rural poor, given that it was increasingly clear that conflicts in the third world would continue to grow, with their participation. This is an early instance of the often-invoked "winning the hearts and minds" argument, which he skillfully employed to convince the bank's investors that a social approach was necessary. And for McNamara, the most intensive intervention was to be in agriculture. In order to increase food security for the rural poor he proposed to bring the Green Revolution to Asia, Africa, and Latin America. The World Bank under McNamara in its rhetoric, policy, and operations had pledged to improve the lives of the rural poor of the world in order to pacify a threat they were taken to pose to neoliberal globalization. Yet its development projects, many of which which go so terribly wrong, are deeply embedded in the governance structures of receiving states.

The failure of a British geologist to test Sutradhar's water set off a chain of events as the government of Bangladesh, donor countries, the UN, as well as other NGOs and development agencies could reassure themselves that it was perfectly fine to launch a territory-wide hydraulic intervention to make groundwater into the main source of drinking water. The work also involved the social dimension of convincing the rural poor to stop drinking surface water, thus adapting local knowledge to that of the agents of development. When it was discovered that the government had produced a water policy based on the report's findings, Brotee initiated the casework against the NERC. It is not clear how Sutradhar came to be the one person in whose name the case would be made. As I discovered, competing interests of law firms and NGOs were bigger factors in how the case took shape than the victim himself. In the case against geologists it was the very absence of arsenic from the report which implicated science. This is in contrast to the previous medico-legal history of the poison, in which it was always the role of the expert to prove the (already suspected) presence of arsenic in a substance, whether food or drink. For the first time a test was involved in court in which the crucial issue was that the experts did not test for the poison. The British Geological Society stated that they were not testing for arsenic and could not have known of the need to test for the element at the time.

Mimika, West Papua

> When someone is stabbed and killed in an attack with an arrow in Timika, we can easily identify the perpetrator's clan from the arrow's characteristics. But we can hardly identify it from a bullet.
> — Arnold Romsumbre (Papuan human rights activist)[17]

The second case is one of environmental poisoning in Papua, Indonesia. The Freeport Grasberg mine is the largest gold mine and third largest open-pit copper mine in the world. Tailings (waste residue) containing arsenic and other pollutants from the mine have for years been poisoning the drinking water, rivers, and coastal mangrove forests of the Mimika region. The mine is operated by US mining corporation giant Freeport McMoran. The company has shadowy links to Indonesia's military, who are responsible for documented massacres and other human rights violations against the Papuan people, including aerial bombings, extrajudicial killings, torture, assassinations, disappearances, detentions, forced displacements, and the rape of civilians.[18] The mine is in the heart of the ancestral land of the indigenous Amungme and Kamoro, two of the many ethnically Melanesian indigenous peoples that make up Papua. The environmental violence perpetrated by Freeport McMoran with the backing of military force has brought death and sickness to the people, and destroyed their food sources and livelihoods. Can evidencing environmental violence in the Mimika region prove that the damage caused to rivers and forests also constitutes harm to the people? What is the place of national environmental law when it is not enforced? Do the combined actions of the Indonesian military and Freeport amount to genocide, that is, to "the systematic and targeted killing of a people," as claimed by Benny Wenda, a Papuan independence leader and leading spokesperson for the Free West Papua campaign living in exile in the UK?[19]



Fig. 11. Monument for the liberation of Irian Jaya, Jakarta, 2012. Photo: Etienne Turpin.

Shaped like the neck of a giant bird, Papua is one of Indonesia's largest and most profitable provinces, yet also its poorest. Far from Indonesia's capital Jakarta and the seat of power, it makes up half of the world's second largest island, New Guinea. While remaining geopolitically peripheral, Papua and West Papua have powerful global

connections. Among its numerous natural resources, under Papua's Mimika region lie the planet's largest gold and copper reserves. The land is covered in tropical, coastal mangrove forests and glacial mountains; the island is considered to host the most biodiverse and largest forest in the world after the Congo and the Amazon. Two worlds of violence, political and environmental, the punitive power of the Indonesian state and global capital, collude to hold this territory under a brutal military occupation.[20]

Freeport PT Indonesia, a subsidiary of Freeport McMoran, began a large-scale mining project in West Papua with support from President Suharto's regime as early as 1963, while the status of Papuan territory was still being disputed with the Dutch. Allowing the mining company to seize this remote part of what was soon to be unquestionably part of Indonesia's territory was part and parcel of Suharto's doctrine of New Order, which used development in the form of foreign investment as one of its main economic drivers. Handed over several years before the so called "Act of Free Choice" of 1969,[21] the Freeport Grasberg mine came both to symbolize and to act as a site of conflict for the annexation of indigenous territories. While it is Indonesia's single largest taxpayer, the company is not held accountable for its use, over several decades, of the environmentally destructive practice of open-pit mining.

The Free Papua Movement (OPM, Organisasi Papua Merdeka) and other groups fought a guerilla war against the state immediately following the Act of Free Choice, while a host of indigenous activist groups and politicians have continued to negotiate and infiltrate the state.[22] In many ways the Grasberg mine and its environmental violence has been a nexus of their grievances; it was made a site of conflict as early as 1977, when the Free Papua Movement blew up an ore pipeline at the mine. The military retaliated with Operation Tumpas, killing thousands of civilians.[23]

Open-pit mining is known to be one of the most environmentally harmful mining practices. In the Mimika region mining has permanently altered the landscape. Freeport uses a 293,000-hectare area stretching from the Otomina and Ajkwa River to the Ararfura Sea as a geotechnical system for the depositing of tailing.[24] The journey begins from the mine located more than four thousand meters above sea level and progresses through its ore-processing center down to the lowland estuaries and a diverse, forested coastal zone of mangroves, sago, tropical, and cloud forests. The occupation by the mining company traverses both a vertical and horizontal path of destruction. Over two hundred thousand tons of tailings flow through the river per day into this area in the form of acid mine drainage, bringing highly toxic amounts of arsenic, copper, cadmium, and selenium. Arsenic is known to be present with high residual concentration as a by-product of copper mining. While there have been major studies on arsenic pollution in Bangladesh, the health effects of possible arsenic pollution in Indonesia are largely undocumented.[25] This is all the more true in the remote province of Papua, which has some of the poorest public health facilities in the country.



Fig. 12. The annexation of Irian Jayu, Diorama, Museum of National History (MONAS), Jakarta, 2012. Photo: Nabil Ahmed.



Fig. 13. Grasberg mine, West Papua, Indonesia, 2011. Photographer undisclosed. Image courtesy of West Papua Media Alerts, http://westpapuamedia.info.

While there have been claims made by villagers to local NGOs of illness related to drinking polluted river water and the disappearance of indigenous fishing, the impacts of pollution are unclear and require further study. Moreover, the objectivity of existing Environmental Impact Assessments is disputed as they are all funded by Freeport.[26] Politically, with its aspirations for independence, Papua remains the most militarized province of Indonesia, with extremely limited access afforded to journalists and human rights workers. Mining pollution and political instability must be understood here as deeply intertwined. From an ecological point of view, large tracts of forest have already disappeared, with irreparable biodiversity loss in the mining region. The environmental violence backed by military force has caused death and sickness, and destroyed the food sources and livelihoods of both the Amungme, who live in the highlands, and the Kamoro, who call the south-coast lowlands their home.[27]

In the case of Papua, it seems the rivers are both the victims (as rivers) and instruments (as part of the geotechnical tailing management system) of a crime against nature and against humanity. The river is no longer only a river but a new form of assemblage, an out-of-the-way place that has severe local effects and plugs into the global political ecology. The question arises, was it the polluted river—part of a rogue, yet politically legitimate mining operation—or the intentional action of military forces, that was responsible

for killing or harming in this scenario? The answer may appear to be both. However, these two possibilities are likely to be dealt with in two separate types of forum, that of environmental law and that of international humanitarian law (IHL). The large-scale pollution caused by Freeport is illegal. In an interview Abetnego Tarigan, the Director of WALHI (Indonesia Forum for the Environment), explained that his organization had won a case in 2007 in Indonesian courts that found the tailing practices to be illegal under Indonesian law.[28] No action was taken. Business continues as usual, with plans underway to dig even deeper into a spiraling hole in the earth.

These two separate branches of international law, environmental law and IHL, can be understood through the single frame of forensic architecture as a method of analyzing and understanding diffused causalities. This is because the entanglement of the two spheres of violence is registered in one, the territory itself. It is not in the relationship itself between the mining activities and the environmental violence they appear to produce that we must identify these diffused causalities, nor in the connection between the political actions of the Indonesian State and the violence effected against the Amungme and Kamoro peoples. Rather, the task is to provide evidence linking the continuous territorial transformation of the Mimika region by mining activities to the political and physical violation of the people.

Recent developments and activism in Indonesia might offer new ways of evidencing environmental violence in Papua. In May 2013 the word "state" was removed from its position preceding the word "forest" in the Indonesian constitution. It has been replaced by the recognition of the customary forest rights of indigenous peoples. Under what is known as Ruling No. 35, customary forests are now classified as titled forests. The landmark ruling was a result of the Indigenous People's Alliance of the Archipelago (AMAN), the indigenous community of the Kenegerian of Kuntu and the indigenous community of the Kasepuhan of Cisitu petitioning a judicial review on numerous articles of the National Act No. 41 Year 1999 on Forestry.[29] The exploitation of Indonesia's forest resources started under Dutch colonial occupation. The Dutch



Fig. 14. Ajkwa River. Photographer undisclosed. Image courtesy of West Papua Media Alerts, http://westpapuamedia.info.

had infringed upon the land rights of the indigenous people through forest enclosures as a form of territorial violence. After gaining independence in 1949 Indonesia further asserted its rights on indigenous land. Conflicts have resulted from overlapping claims where state and local governments handed over concessions and permits on indigenous lands to logging, mining, and palm-oil companies. The Forest Law of 1999 mentioned above only saw an increase in conflicts; landgrabs of surrounding forests in indigenous territories spread through the archipelago in Sumatra, Java, Kalimantan, Sulewasi, Maluku, Flores, and Papua.

In order to produce evidence of territorial rights, maps and mapping are crucial technical-legal instruments. In response to the state's strong territorial claims exercised through state maps and laws, many indigenous communities have come up with their own maps. The maps were made through a practice of "counter-mapping," which entails the identification of ancient, generational territorial rights and sacred land, whose geographical contours are added to a map using GPS-enabled devices so that they can then be read by computers. More detailed maps are produced from geo-referenced field data gathered by local mapping teams, sketch mapping, and GPS. Thus two very different epistemologies—science and indigenous knowledge—are seen to be acting together, often with NGOs as facilitators. Such practices of counter-mapping by local indigenous communities have played an active part in Indonesia since as early as the 1990s, beginning in West Kalimantan.[30] Recently, Network for Participatory Mapping (JKPP), an international land coalition, and AMAN have submitted maps outlining two million hectares of customary forests in Borneo and Papua to Indonesia's Geospatial Information Agency.[31] There are still over thirty million hectares of indigenous territory left for mapping, a mammoth task for the activists, especially when the encroachment into the land continues. With the change in Indonesia's constitutional law regarding forests, the possibility of righting territorial wrongs has finally appeared on the horizon for millions of indigenous people in the archipelago.



Fig. 15. Local villagers engage in discussion as part of the participatory method of community-based cartography. Yoke Village, Mamberamo Raya, Papua. Photo: Mokhammad Edliadi/CIFOR.

Counter-mapping can also be a valuable tool in the context of evidencing deforestation caused by the activities of the Grasberg mine. With regard to the Mimika region of Papua and the Freeport-Grasberg mine, I have identified three sets of spatial data around which a new spatial-political project can take shape.

The first dataset is used to identify the location of Grasberg's waste dumps and tailings, of which arsenic is a part. This entails understanding the geotechnics of the tailing management system. The second set is drawn from existing forest mapping data, and will be used to identify demarcations of customary forests in the areas affected by the tailing area. Thirdly, multi-temporal satellite images of the region can be used to show land cover change that has already taken place. Superimposing and calculating these

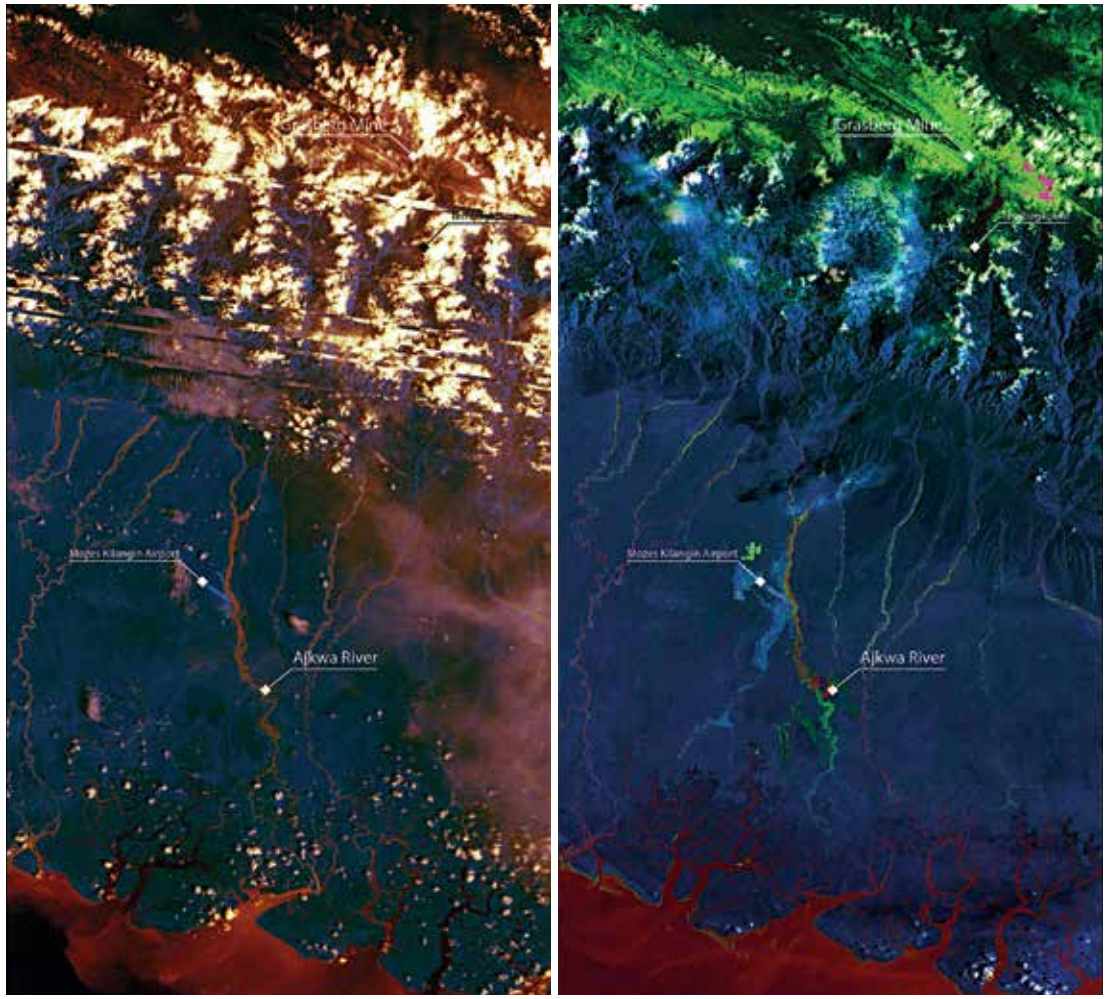


Fig. 16 a–d. Land cover change due to expansion of mine tailing from the Grasberg mine 1983–2013 in Timika region, West Papua, Indonesia. LANDSAT 5 false color composite display. Image: Nabil Ahmed/Adam Bobette.

three sets of data can show what customary lowland forest areas have been destroyed or might be under threat from future deforestation. With the support of fieldwork and analysis to determine the chemical makeup of the tailing area, this wealth of data can be connected and used to monitor the mining company's activities.

In 2004 Suciwati Munir, the wife of Indonesian political activist Munir Thalib, received a phone call from Pollycarpus Priyanto, a man claiming to be a Garuda Airlines pilot. He asked to know the date Munir was flying to Jakarta that month to take up a masters degree in international relations at a university in Amsterdam. Suciwati told him the date and hung up the phone, immediately feeling that she had done the wrong thing.[32] After all, who was Pollycarpus and what did it matter to him when her husband was flying? On the day Munir boarded the airplane, Pollycarpus was on the flight and offered him an upgrade to a business-class seat. Munir accepted. During the flight he ate a bowl of noodles and drank a glass of orange juice. By the time the flight landed in Amsterdam, Indonesia's most outspoken activist was dead. The news of his death sent shockwaves through Indonesia's activist world. While the cause of death was still unknown, the Papuan chapter of the Indonesian Human Rights Monitor (IMPARSIAL), the human rights organization which Munir cofounded, was the first to protest in front of Garuda's office in Jayapura, West Papua. Many there thought he had been poisoned. Munir's autopsy, carried out sixty-four days later by the Forensic Institute in The Hague, showed that arsenic was the lethal agent. The investigative work of activists close to Munir found that Pollycarpus worked for BIN, Indonesia's secret service. Munir Said Thalib, Indonesia's leading political activist, was poisoned by the state security agency with arsenic on a Garuda flight. While his killer has been brought to justice, the organization that ordered the killing remains out of bounds. Besides IMPARSIAL, Thalib was one of the founding members of the Commission for Missing Persons and Victims of Violence (KONTRAS) and campaigned against

human rights violations in the troubled provinces of East Timor, Aceh, and Papua. Yet while East Timor and Aceh have since gained autonomous status, we must raise the question of Papua.

Arsenic moves vertically in both directions from the territory into the body through a complex assemblage of the body of an activist mid-flight, the rural poor in Bangladesh, mangrove forests, rivers, and the emancipatory dream of an indigenous people. This entanglement of natural and political processes of violence has reached a point where it is difficult to differentiate between their causalities. Furthermore, as I have shown, in Bangladesh and Papua, attributing responsibility for poisoned water and deforestation remains difficult due in part to the territorial poisonings being seen as unintended consequences of development and mining where victims—the rural poor and indigenous people—face powerful states and international actors. How can we take political action where "unintended consequences" open up a messy reality in which it is difficult to connect a crime to its location? Was it even a crime? In contemporary times these are political questions for forensic architecture, as human lives and the planet's ecosystem are at stake. The problems posed by the toxic Victorian house are now the most urgent questions that have shaped and continue to shape our relation to the planet.

1 Primo Levi, *The Periodic Table* (New York: Schocken Books, 1984), 28.

2 Arsenic, since its discovery in elemental form in the Middle Ages by the polymath and Dominican friar Albertus Magnus, came to fascinate Victorian society. For further reading see James C. Whorton, *The Arsenic Century: How Victorian Britain was Poisoned at Home, Work, and Play* (Oxford: Oxford University Press, 2011); and Katherine Watson, *Forensic Medicine in Western Society: A History* (Abingdon: Routledge, 2010).

3 This section of the essay is indebted to Andrew Meharg and the research he presented at the "Earthly Poison: Arsenic in the Bengal Delta" roundtable seminar organized by the Forensic Architecture project and me in May 2013 in London. See Andrew Meharg, *Venomous Earth: How Arsenic Cause the World's Worst Mass Poisoning* (Hampshire: Palgrave McMillan, 2004).

4 The *pharmakon* first appeared in Plato's account of writing as both poison and remedy for the forgetfulness of the soul in the dialogue of the Phaedrus. Later it is Jacques Derrida who gives a contemporary account of Plato's pharmacology of writing as pharmakon. For Derrida the pharmakon is a dissident concept of philosophy that refuses to be translated as either poison or remedy; rather, it necessarily carries both properties. Choosing only one of its meanings leaves the concept incomplete; the pharmakon thrives in the non-agreement. See Jacques Derrida, "Plato's Pharmacy," in *Dissemination*, trans. Barbara Johnson (Chicago: University of Chicago Press, 1981), 63–171.

5 James Marsh, "Account of a Method of Separating Small Quantities of Arsenic from Substances with Which it May Be Mixed," *Edinburgh New Philosophical Journal*, vol. 21 (1836): 229–36.

6 Orfila, a Spanish doctor who practiced and lived in France, was the author of the groundbreaking book on toxicology, *A General System of Toxicology; or a Treatise on Poisons, Found in the Mineral, Vegetable, and Animal Kingdoms, Considered in the Relations with Physiology, Pathology, and Medical Jurisprudence* (Philadelphia: M. Carey & Son, 1817).

7 Meharg, *Venomous Earth*, 131.

8 Ibid., 67–68.

9 Rob Nixon, *Slow Violence and the Environmentalism of the Poor* (Cambridge, MA: Harvard University Press, 2011), 3.

10 A toxic tort is a personal injury lawsuit where the victims claim that chemical exposure, in this case through drinking water, caused them bodily harm.

11 The 1970 Bhola cyclone and the 1971 Bangladesh Liberation War and genocide are crucial events in the emergence of the humanitarian NGO movement during the Cold War and therefore of global importance. Along with the Biafra war, the violence unfolding in Bangladesh directly influenced the creation of humanitarian organizations such as Médicins Sans Frontières. Khushi Kabir, a long-time landless rights activist in Bangladesh, told me during an interview in Dhaka in 2013 how the cyclone was a rallying call for NGOs to take action.

12 The precise numbers of dead are not known and no war-crimes tribunal was ever set up, as Pakistan denies committing genocide. Bangladeshi figures place civilian casualties at three million, although this is contested. In 2010 a local initiative to investigate alleged war crimes by Bangladeshi collaborators was established by the Awami League government. For further discussion see Wartdatul Akmam, "Atrocities against Humanity during the Liberation War in Bangladesh: A Case of Genocide," *Journal of Genocide Research* vol. 4, no. 4 (December 2002): 543–60.

13 The term "development" was first used specifically in the case of newly independent postcolonial countries after the World War II to address the issue of integrating precapitalist economies into the capitalist system. Foreign aid was the main way of providing capital and expanding government and governmentality. For a study of development in Bangladesh, see Abdul Bayes and Anu Muhammad, eds., *Bangladesh at 25: An Analytical Discourse on Development* (Jahangirnagar: Jahangirnagar University Press, 1997), 47–48.

14 See the UNICEF report, *Arsenic Mitigation in Bangladesh* (New York: United Nations, 2008), http://www.unicef.org/bangladesh/Arsenic_Mitigation_in_Ban gladesh.pdf.

15 J. Davies and C. Exley, *Hydrochemical Character of the Main Aquifer Units of Central and Northeastern Bangladesh and Possible Toxicity of Groundwater to Fish and Humans* (Keyworth: British Geological Survey, 1992), Tech. Rep. WD/92/34R, Suppl. WD/92/44R.

16 Michael Goldman, *Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalization* (New Haven, CT: Yale University Press, 2005).

17 Cited in Yosepha Alomang, "Freeport donates Rp 5.8b to human rights foundation," *Jakarta Post*, March 2, 2012.

18 For a historical record, see Asian Human Rights Commission, The Neglected Genocide: Human Rights Abuses Against Papuans in the Central Highlands, 1977–1978 (Hong Kong: Asian Human Rights Commission & Human Rights and Peace for Papua, 2013), 7–19.

19 I met Benny Wenda at a meeting of International Parliamentarians for West Papua in the Houses of Parliament on October 16, 2013, in London. When I asked him whether he thought there was a genocide taking place in his country he clearly stated yes.

20 Violence in Papua does not often make front-page international news. One reason may be that the Indonesian state does not allow journalists to enter the territory. Websites-such as West Papua Media Alerts run by Papuan activists living in neighboring Australia have been reporting on human rights violations in Papua for over a decade. See http://www.westpapuamedia.info.

21 The Act of Free Choice refers to a deal brokered between the Dutch and the Indonesian state whereby indigenous people of Papua were given a choice under UN protection (the first in the history of the UN) between becoming an independent state or joining Indonesia. Though they chose the latter, it is well known that the choice was made at gunpoint.

22 For a remarkable study of the complex and nuanced Papuan independence movement, and particularly how it operates through collaboration just as much or more than resistance, see Eben Kirksey, *Freedom in Entangled Worlds: West Papua and the Architecture of Global Power* (Durham, NC: Duke University Press, 2012).

23 Tumpas is Bahasa Indonesia for annihilation. See West Papua Media Alerts, "Chronology of Events in West Papua," http://www.rizeofthemorningstar.com, last accessed October 10, 2013.

24 "Tailing" is the waste material in the form of finely grounded natural rock that is left after the concentrate has been removed from the ore at the mill.

25 Muhammad Ilyas et al., "Is Arsenic a Potential Threat for Human Health in Indonesia?," *Interdisciplinary Studies on Environmental Chemistry–Environmental Research in Asia*, vol. 2 (2009): 185–89.

26 International Institute for Environment and Development (Mining, Minerals, and Sustainable Development project), Mining for the Future Report (April 2002), Appendix J: Grasberg Riverine Disposal Case Study, http://pubs.iied.org/pdfs/G00563.pdf, last accessed December 2013.

27 For a recent report that connects human rights abuses to deforestation and that mentions Papua, see Human Rights Watch, *The Dark Side of Green Growth: Human Rights Impacts of Weak Governance in Indonesia's Forestry Sector,* (July 16, 2013) http://www.hrw.org/re ports/2013/07/15/dark-side-green-growth.

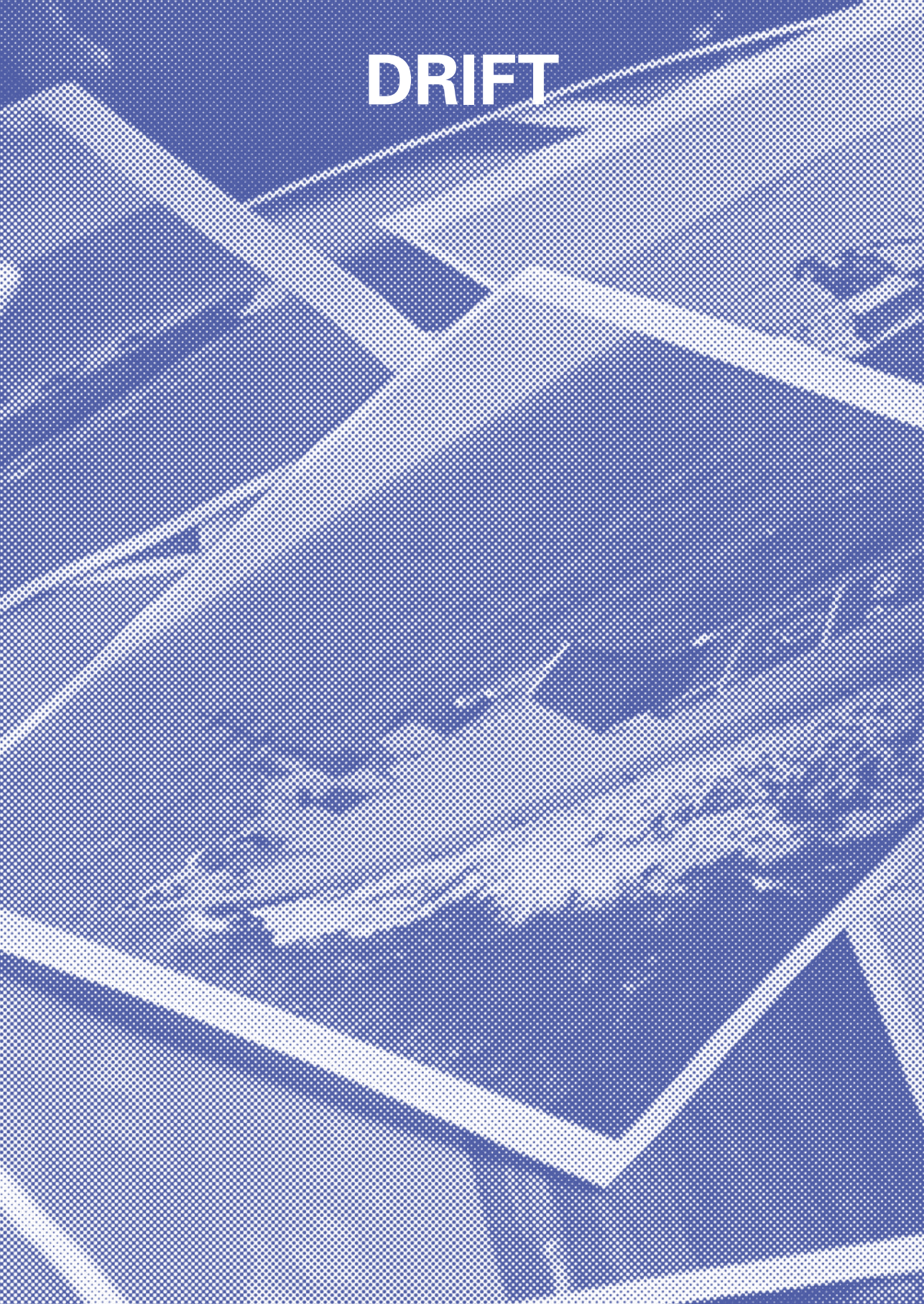
28 Abetnego Tarigan, interviewed by the author, Jakarta, June 2013.

29 See Indonesia Nature Film Society & HuMa, *The Customary Forests after the Constitutional Court's Ruling No. 35* (Indonesia, 2013), video documentary, 27 min.

30 Kalimantan rainforests in Borneo and numerous indigenous communities suffered devastating forest exploitation at the hands of multinational companies and the Indonesian state. The anthropologist Anna Tsing has written an insightful book connecting the local forests to the global political ecology, titled *Friction: An Ethnography of Global Connection* (Princeton, NJ: Princeton University Press, 2004). See also Nancy Lee Peluso, "Territorializing Local Struggles for Resource Control: A Look at Environmental Discourses and Politics in Indonesia," in Paul R. Greenough and Anna Lowenhaupt Tsing, eds., *Nature in the Global South: Environmental Projects in South and Southeast Asia*, eds. Paul R. Greenough and Anna Lowenhaupt Tsing (Durham, NC: Duke University Press, 2003), 231–52.

31 Jaringan Kerja Pemetaan Partisipatif (JKPP) and Aliansi Masyarakat Adat Nusantara (AMAN, Indigenous Peoples' Alliance of the Archipelago).

32 Personal interview with Usman Hamid, Human Rights Activist and Munir's close friend, who was the chief witness in the prosecution of Pollycarpus Priyanto.


DRIFT

Case: “Left-to-Die Boat”

Charles Heller, Lorenzo Pezzani, and SITU Research



Fig. 1. Lorenzo Pezzani, of Forensic Oceanography, presenting new evidence and spatial analysis on the “left-to-die boat" case at a press conference held in Paris on June 18, 2013 that announced new legal cases in France and Spain. The new cases were filed by two of the survivors, supported by several NGOs, after the initial complaint lodged in April 2012 was ignored by the Paris Prosecutor’s Office.

Forensic Oceanography: The Deadly Drift of a Migrants’ Boat in the Central Mediterranean, 2011

While from 1988 to March 2012 there were 13,417 documented deaths at the maritime borders of the EU, according to the Office of the United Nations High Commissioner for Refugees (UNHCR), 2011 was the “deadliest year” in the Mediterranean since the organization began recording migration statistics for the region in 2006.[1] The UNHCR estimated that over 1,500 migrants died while fleeing Libya during the initial stages of the conflict that began in February 2011 while a wave of uprisings, known collectively as the Arab Spring, enveloped the Middle East.

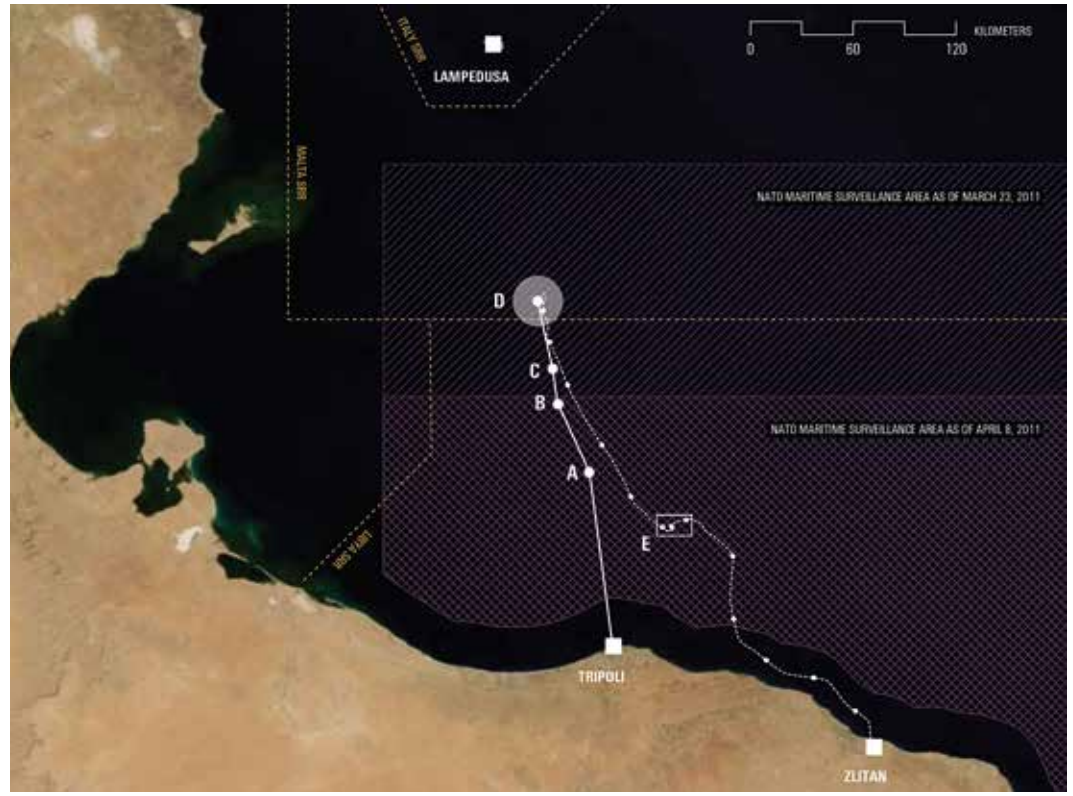


Fig. 2. The following is a summary of key events: the migrants’ vessel left the Port of Tripoli between 00:00 and 02:00 GMT on March 27, 2011 with 72 migrants onboard. The vessel was probably sighted by a French aircraft which transmitted its coordinates to Rome Maritime Rescue Coordination Center MRCC (A). After proceeding in the direction of Lampedusa for 15–18 hours, the migrants placed a distress call by satellite phone to an Eritrean priest based in Italy (B). The priest, in turn, called the MRCC in Rome to alert them to the fact that there was a vessel in distress. Shortly following this call, the MRCC in Rome published an Enhanced Group Call message and alerted both Malta MRCC and NATO HQ allied command in Naples that a vessel was in distress. It also provided them with the vessel’s geographic coordinates in latitude and longitude at 16:52 GMT. Following the broadcast of the vessel’s position, a helicopter arrived, observed the boat and left. After this visit by the helicopter, the position of the boat was determined a second time as 9 nautical miles NNW of the earlier position (C). The migrants then waited 4–5 hours in the same area, where their requests for help from some fishermen went unheeded. Still in the same position, the vessel was visited for a second time by a military helicopter that dropped biscuits and water before leaving. The vessel then continued NNW towards Lampedusa for 5–8 hours before running out of fuel at approximately 07:00 GMT on March 28, at which time the boat began to drift (D). The boat drifted SSW for 7–8 days before it encountered a military ship (E). On April 10, the boat landed south-east of Tripoli at Zlitan. Upon landing, 11 migrants were still alive. 2 died shortly thereafter. Visualization: Forensic Architecture and SITU Research.

Most notable is the fact that the loss of lives at sea in 2011 occurred in the context of the heightened concentration of Coalition/NATO assets in the area enforcing a maritime embargo of Libya during the conflict. This places these deaths squarely in the most highly surveyed area of sea in the entire world.

Among the many vessels that attempted the journey, one particular boat was covered extensively in the international press. Coming to be known as the "left-to-die boat," the case involved the journey of 72 sub-Saharan migrants fleeing Tripoli by boat on the morning of March 27, 2011. After traveling about halfway to the Italian island of Lampedusa during their first day at sea, the vessel ran out of fuel and subsequently drifted for the following 14 days without food or water until landing back on the Libyan coast. Only 9 of the passengers ultimately survived. In interviews following the event the survivors recounted a series of interactions they had with others while at sea. This included a military aircraft that flew over them, a distress call they placed via satellite telephone, two encounters with a military helicopter and fishing vessels, and an encounter with a military ship. Moreover, the Italian and Maltese Maritime Rescue Coordination Centers, as well as NATO forces present in the area, were informed of the distress of the boat and of its location, and had the technical and logistical ability to assist it. Despite the legal obligation to render assistance to people in distress at sea enshrined in several international conventions,[2] none of these actors intervened in a way that could have averted the tragic fate of the people on the boat. An NGO coalition was formed to demand accountability for these deaths that were allowed to occur despite heightened surveillance and for those of the "left-to-die boat" case in particular.[3]

Methodology

In an effort to understand the events that led to this tragedy, we undertook a report, with the aim of providing a spatio-temporal reconstruction of the 15-day period between March 27, 2011, when the vessel left the Port of Tripoli, and April 10, 2011, when it washed ashore at Ziltan.[4] In this effort, we attempted to account both for the events as they were experienced by the passengers and for the conduct of the actors who were either in direct contact with the passengers, in the vicinity of their vessel, or informed of their distress. Because of the complex legal structure of the Mediterranean and the high number of actors operating there during the time of the event in question, creating a coherent spatial picture was critical for determining the degree of involvement of each of these parties.



Images taken from the video of the interview with survivor Daniel Haile Gebre conducted by Lorenzo Pezzani and Charles Heller, Milan, December 22, 2011.

Fig. 3. In this still, Haile Gebre writes the text that he saw on the side of the helicopter. It reads "RESCUE ARMY," although he is not sure about the presence of the first word ("RESCUE").



Fig. 4. Image of the United Kingdom Army Air Corps Westland Lynx, which Haile Gebre recognizes as having a similar color to the helicopter that hovered over the migrants' boat.



Fig. 5. When shown the image of the Italian ship *Borsini*, he recognizes it as having the same shape as that of the ship the migrants encountered.

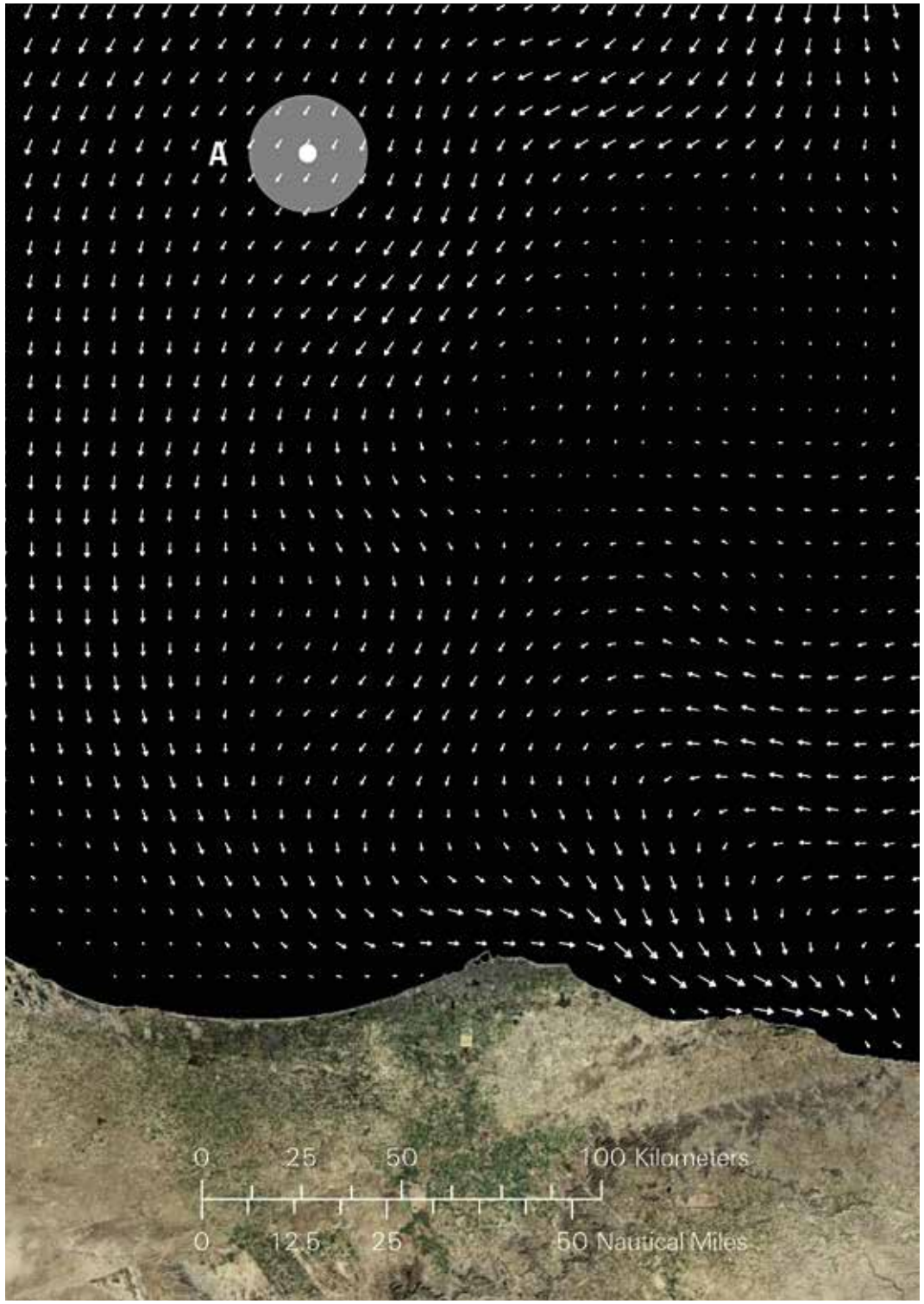


Fig. 6. The approximate area within which the vessel began to drift becomes the initial error in the drift model (A). Visualization: Forensic Architecture and SITU Research.

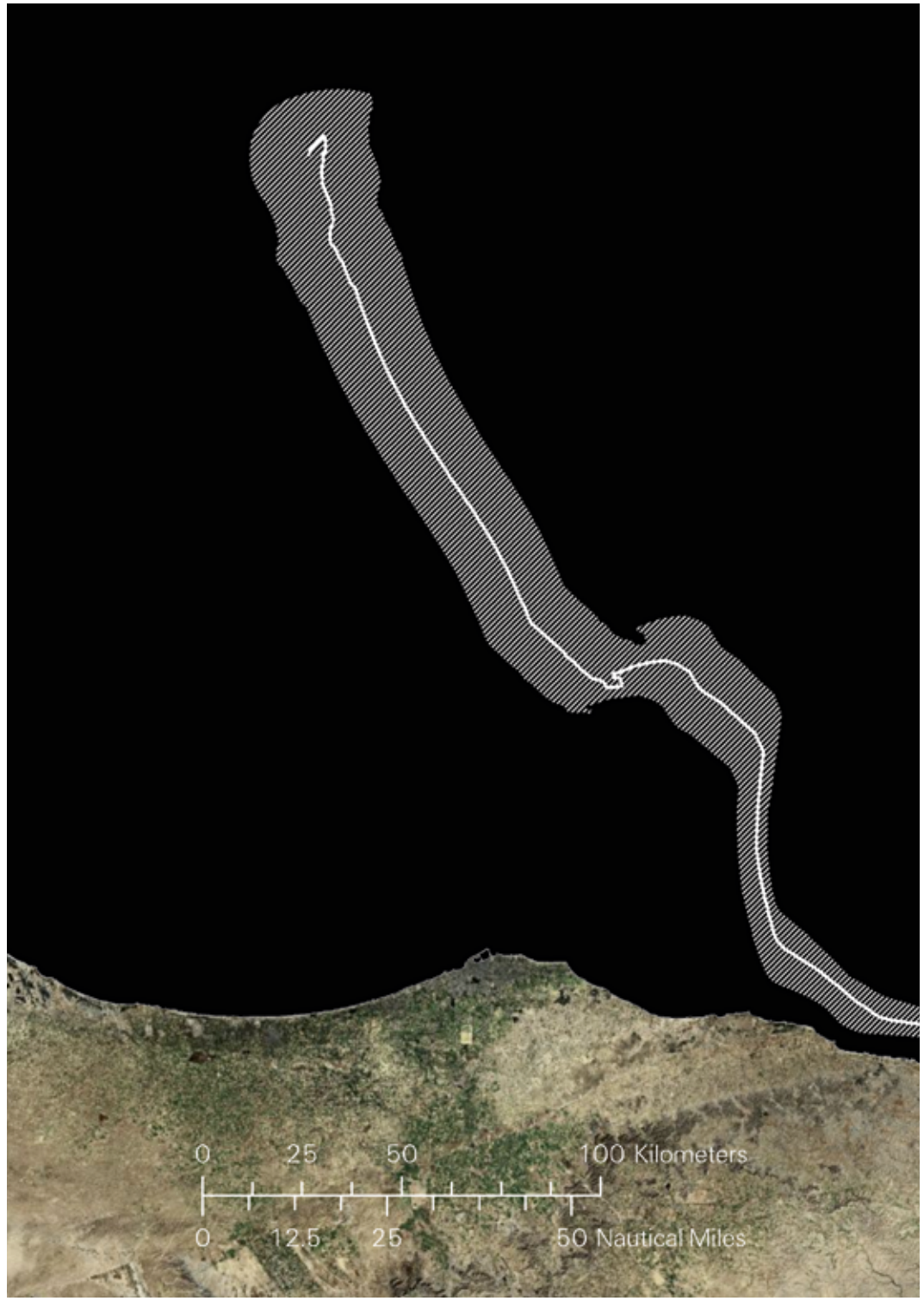


Fig. 7. Over time, the margin of error in the drifting vessel's track linearly decreases as it is constrained by the known position of landing. Visualization: Forensic Architecture and SITU Research.

A comprehensive textual analysis was undertaken in concert with the production of a series of visualizations, diagrams, and figures. This work was an exercise in the culling of disparate data (geospatial, meteorological, testimonial, military, and other) that was ultimately recombined in an effort to assemble a coherent spatial narrative of the chain of events. The diversity of sources and types of data required the report to draw upon the methodologies and expertise of a variety of disciplines, among them remote sensing, cinematography, architecture, and oceanography. The result is a synthetic spatial product that leverages increasing technological interoperability and cross-disciplinary collaboration to help address what was a humanitarian and legal failure.

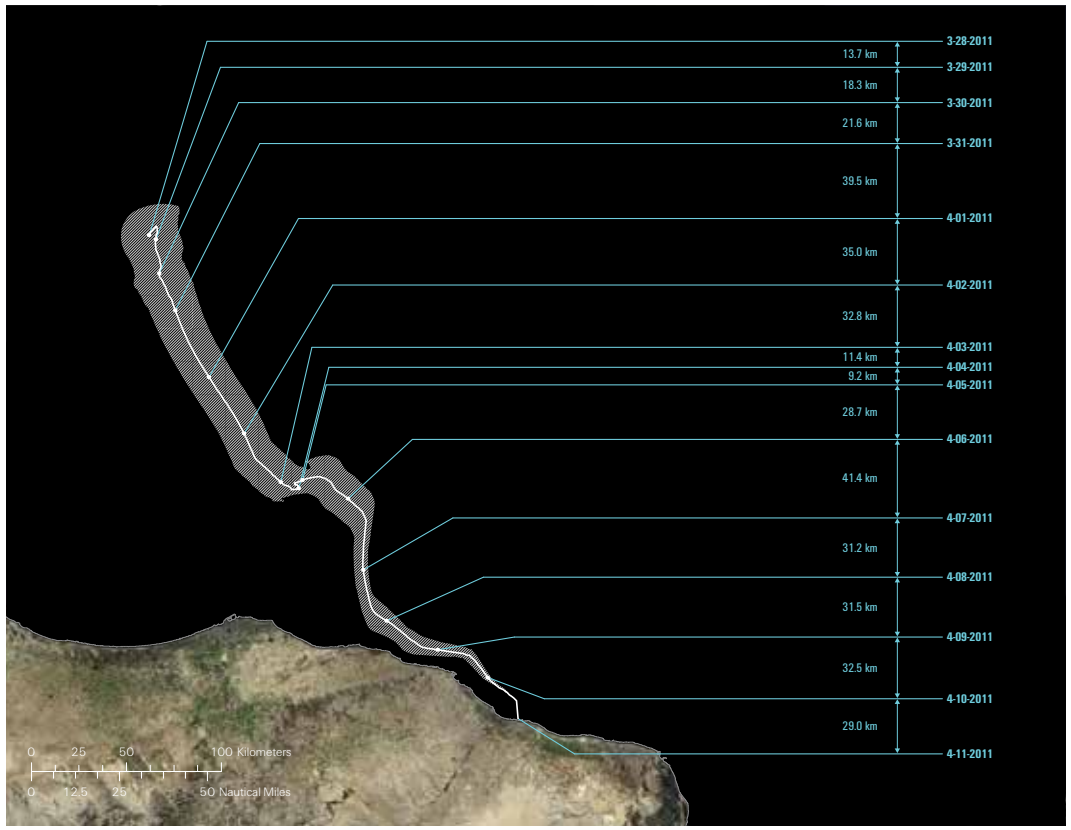


Fig. 8. Richard Limeburner, senior research specialist in the Department of Physical Oceanography at the Woods Hole Oceanographic Institution, created a drift model for this report to simulate the path of the migrants' vessel after it started floating without any use if its motor. Limeburner's model provides hourly positions of the vessel on the basis of ocean current data and wind. Tidal currents, which can influence drift track, were ignored for this model as they are relatively weak within the area in question, and only occur periodically within a 24-hour cycle. Visualization: Forensic Architecture and SITU Research.

Gathering the initial data

Before focusing specifically on the "left-to-die boat" case, extensive fieldwork was conducted in Southern Italy to build an overall understanding of the conditions in which maritime crossings were taking place during this period. 68 migrants who had recently crossed the Mediterranean were interviewed, as well as representatives from the Coast Guard, immigration lawyers, and fishermen operating in the Sicily Channel.

Following the decision of the NGO coalition to focus its demand for accountability on the "left-to-die boat" case, specific information on the case was initially acquired through interviews—conducted by ourselves, human rights workers, and journalists—with the survivors and other actors involved. In the interview we conducted with Dan Haile Gebre, one of the survivors, we tried to depart from formats of witnessing normally associated with humanitarian organizations. Rather than placing the emphasis on the subjective dimension of his experience, the interview methods we employed aimed at assisting him in the recollection of any precise element that could support the reconstruction of the spatio-temporal coordinates of the event and the identification of the various vessels and aircrafts that the migrants encountered while at sea. To this end, we gave Dan Haile Gebre a notepad and a felt-tip pen, asking him to draw or write any element that he made reference to. We also asked for temporal points of reference throughout the narrative of the events, inquiring for instance whether events had taken place at dawn, in the daytime, at sunset, or at night, and trying to reconstruct the passage of time by making informed guesses about fuel consumption, average speed of the boat, and so forth. Finally, we inquired about information such as the color and shape of the encountered vessels and aircraft, the presence of flags or writings on their hull, and the language spoken by the crew. To support this process, we presented him with pictures of maritime assets that were present in the area at the time of the events.

Elements of information were also extracted from news reports, as well as publicly available official documents concerning the incident. In this respect, an important source of information was the parallel and complementary inquiry led by Dutch Senator Tineke Strik on behalf of the Parliamentary Assembly of the Council of Europe which resulted in a report entitled "Lives lost in the Mediterranean Sea: who is responsible?"[5]

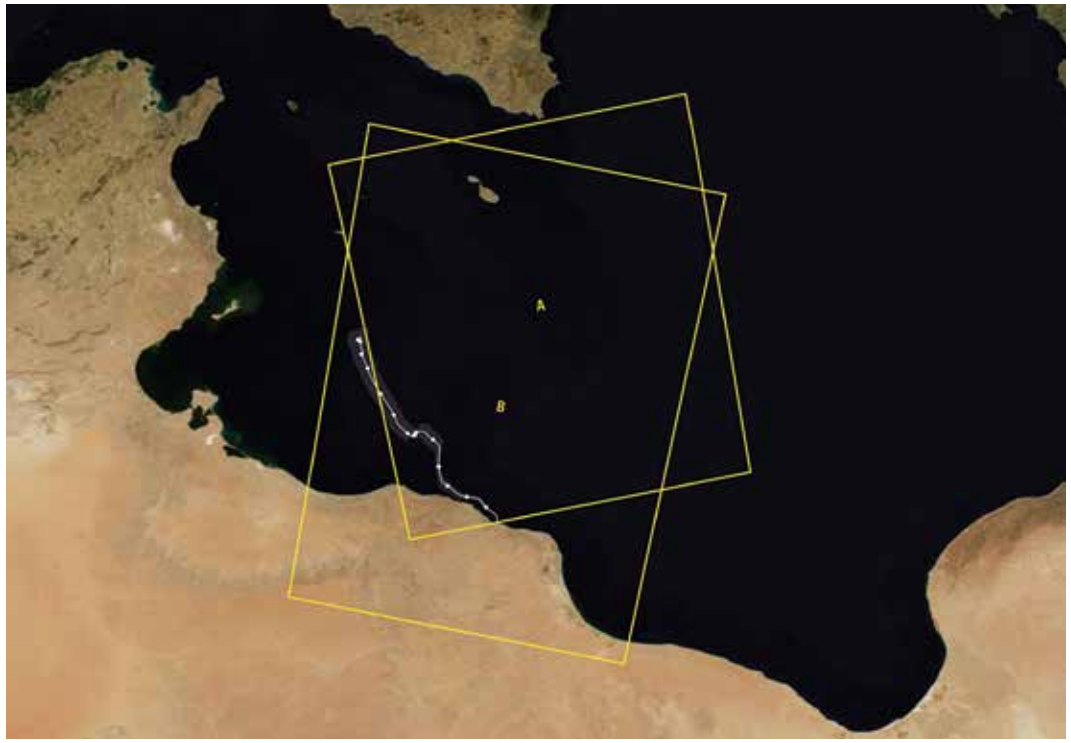


Fig. 9. Moderate to fine resolution satellite resources, such as optical satellite imagery, are not normally collected over the open ocean. However, Synthetic Aperture Radar (SAR) data is routinely collected over the Mediterranean Sea. For the purposes of this report, Envisat data was acquired for March 28 (A) and 29 (B), which provides a snapshot of maritime activity in the area. Lawrence Fox III, Humboldt State University Emeritus Professor of Remote Sensing and consultant, provided analysis of this data. Fox's analysis provided estimates of ship length and quantification of confidence for all returns considered probable vessels. The resolution of the Envisat-1 data allows for high confidence detection of ships 75 meters and longer. On March 23 the US Department of Defense disclosed that 38 NATO ships were being deployed in the frame of the 2011 military intervention in Libya. 37 of 38 ships were above 75 meters in length. Visualization: Forensic Architecture and SITU Research.

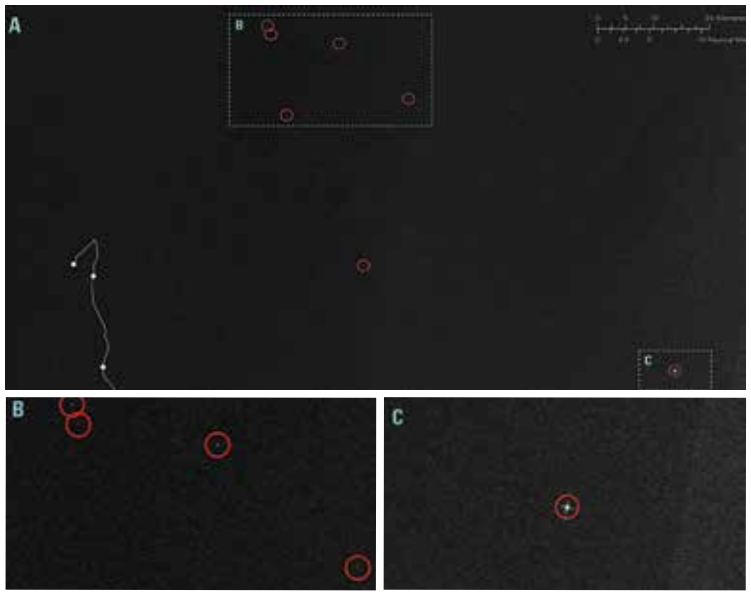


Fig. 10. Overview of ship detections from March 29 Envisat data (A) with enlargements of (B) and (C). The SAR returns appear as bright pixels against the surrounding sea surface (eight times the brightness on average in the data analyzed for this report). In the case of the Envisat data, low variability of the background sea pixels means that even moderately bright returns indicate the presence of vessels. The brightness of (C) is due to an interference pattern that occurs when the geometry of the target aligns for maximum return. Visualization: Forensic Architecture and SITU Research.

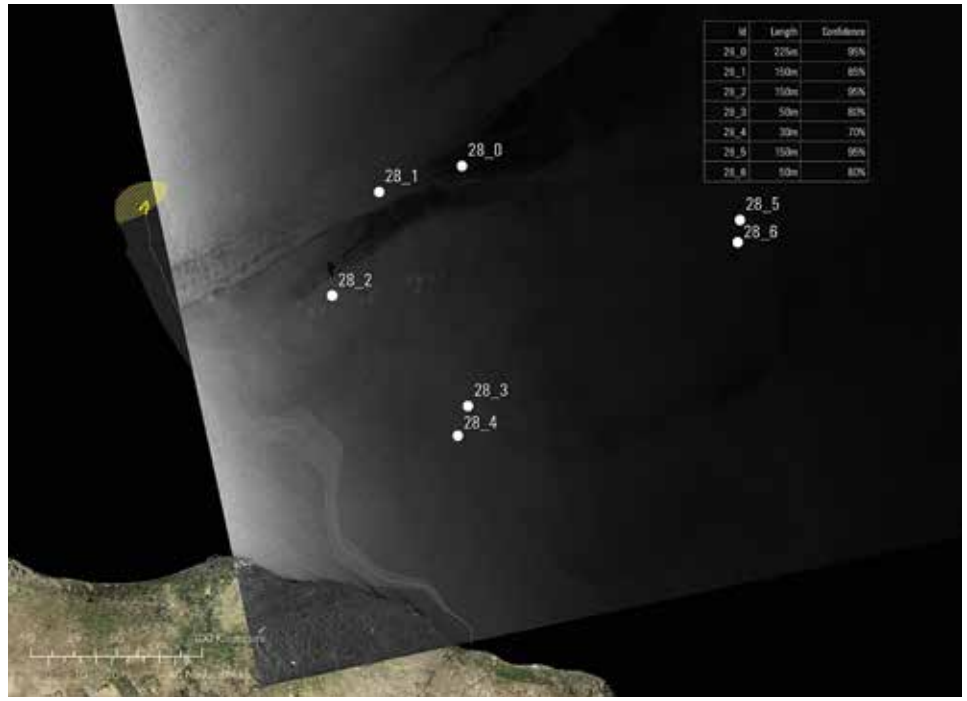


Fig. 11. (above) Envisat-1 data vessel detection for March 28 with corresponding table of returns documenting estimated length of vessel and confidence. Return 28_2 was between 82 and 94 NM away from the ship's drift, while return 28_1 was between 89 and 105 NM away and return 28_0 was between 115 and 132 NM away. Visualization: Forensic Architecture and SITU Research.

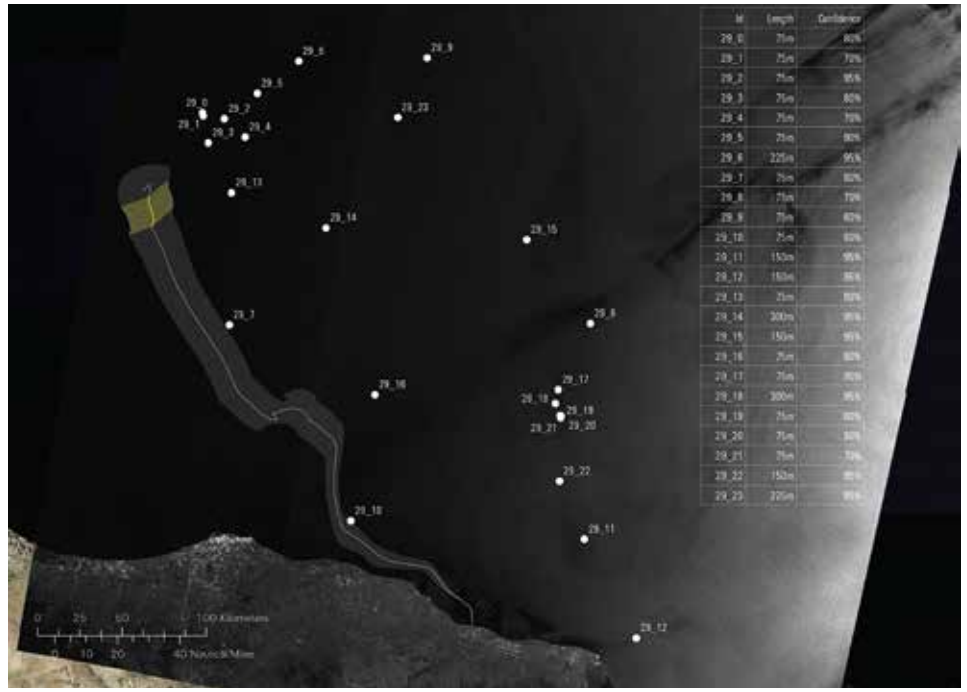


Fig. 12. (below) Envisat-1 data vessel detection for 29 March with corresponding table of returns documenting estimated length of vessel and confidence. Return 29_13 was between 20 and 34 NM away from the ship's drift, while return 29_3 was between 25 and 33 NM away and return 29_1 between 32 and 38 NM away. Visualization: Forensic Architecture and SITU Research.

Determining the trajectory of the migrants' vessel

Based on these initial elements, we began writing the report with the aim of determining the location of the migrants' vessel throughout its 15 day drift at sea. To this effect, all available information was geolocated. This information was collected in a variety of formats and translated into latitude/longitude and mapped in relation to a timeline of events. This initial set of points, which documented key information such as encounters with other vessels and point of drift, provided the foundation for all subsequent analyses. With this main timeline in place, strategies were explored to model the trajectory of the boat from the time it ran out of fuel until when it finally landed back on shore, south of Tripoli. A conversation was begun with oceanographer Richard Limeburner of Woods Hole Oceanographic Institute, who had experience modeling the trajectory of objects in the open ocean based on subsurface currents and wind. Working with Limeburner, a drift model was created that takes known components of the case (i.e. the point of drift, and the dimensions and type of vessel used by migrants) and projects its trajectory over the ensuing 14 days of drift based on available meteorological data. The drift model allowed us to offer a complete map of the vessel's trajectory (with a certain stated margin of error) during the period in question.

Assessing military presence

The analysis then turned to assessing where and when military assets might have encountered or been in the vicinity of the vessel. The first task in this respect was to determine the overall maritime laydown as well as its spatial distribution. In order to do that, we analyzed several documents, among which were various maps released by the US Department of Defense at news briefings showing the maritime laydown of 38 naval assets, press releases and declarations from NATO officials, and the online journals of some of the ships involved in the military operations. Whilst these sources provided an overall image of a congested stretch of sea, they did not help in determining the location of specific assets at certain times and locations. To achieve a more precise picture, we resorted to satellite imagery. Optical satellite imagery, however, was not useful for this application due to its very limited coverage of the open ocean. Alternative remote sensing technologies were explored and, ultimately, a satellite-mounted sensor known as Synthetic Aperture Radar (SAR) was utilized. Not only is SAR uniquely suited for vessel detection, it also generally offers a greater degree of coverage over the open ocean—particularly the Mediterranean—than optical satellite imagery, since it is used by states for monitoring

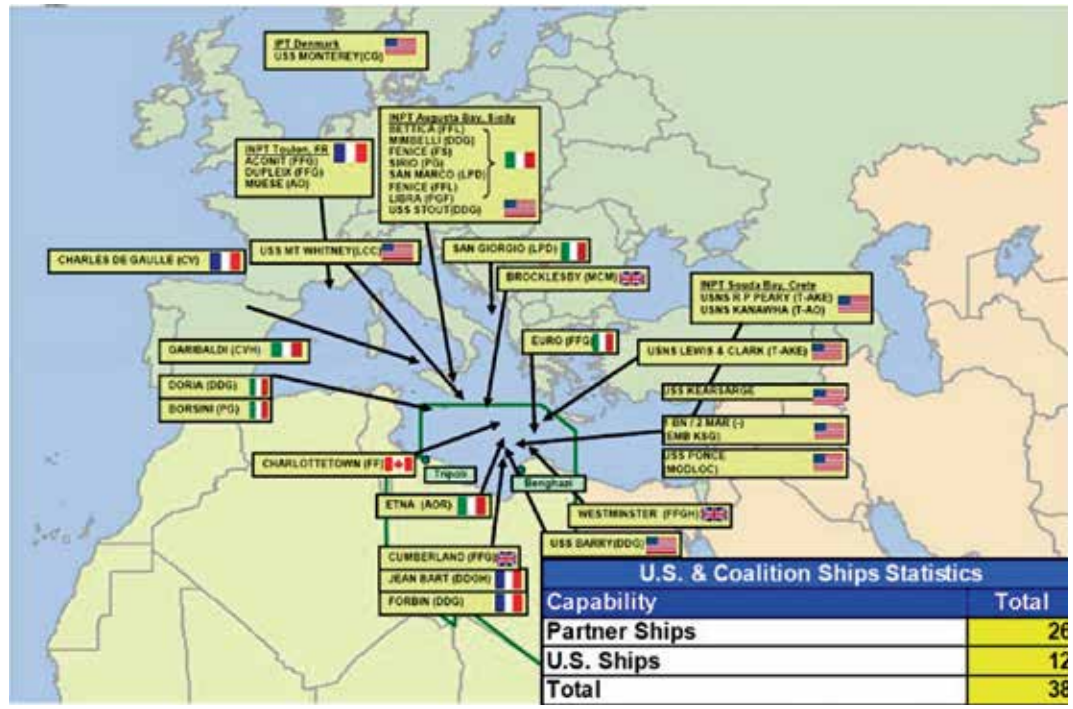


Fig. 13. Slide presented by Vice Admiral Gortney at a US Department of Defense news briefing on March 24, 2011. The image shows the "US & Coalition Maritime Forces Laydown" a few days before the migrants left Tripoli. A total of 38 ships are indicated. Source: US Department of Defense, "DOD News Briefing with Vice Adm. Gortney from the Pentagon on Libya Operation Odyssey Dawn," March 24, 2011, http://www.defense.gov/news/d20110324pptslides.pdf.



Fig. 14. Inside the Operations Room of HMCS Charlottestown (Canada). NATO/coalition naval and aerial assets were equipped with technologies that offered an extremely high sensing capacity geared both towards combat operations and to the monitoring of the Maritime Surveillance Area. The different sensing capabilities were shared between naval and aerial assets, as explained by Commander Craig Skjerpen, Captain of HMCS Charlottetown: "What we do is link up all our radar images together, all the ships, and from that we create sort of a map of all contacts in the area. We are also working with aircrafts that are tracking vessels. And from that we have a full picture of all vessels in the area." Source: "NATO and Libya - Operation Unified Protector: The Arms Embargo," NATOchanneltv, April 1, 2011, http://youtu.be/_dRqzRvvg2Y.



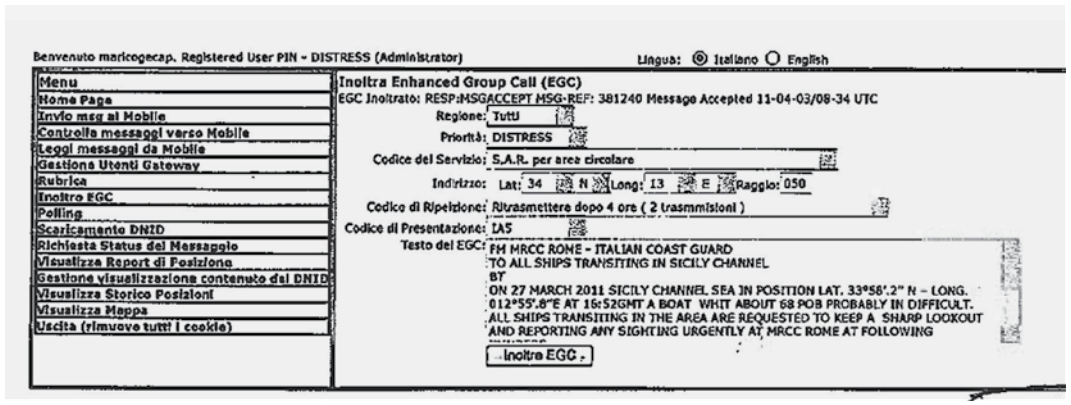
Fig. 15. Inside the operations room of Italian frigate Bettica, as it sails towards its patrol area, "near the border between Tunisia and Libya." Mike Mühleberger, NATO correspondent onboard, explains while describing a monitor presenting maritime traffic and squares delimiting large areas: "The area north of Libya has been divided into patrol sectors assigned to each NATO ship. By sharing information they can be more effective, and ensure that vessels are continuously tracked as they pass from one sector to another." Still from the NATO video "NATO and Libya - Italian patrol ship Bettica enforcing the arms embargo," NATOchanneltv, April 14, 2011, http://youtu.be/fwVPv0sgsk8.

diverse activities, including those of terrorists and irregular migration towards Southern Europe. For the purposes of this case, we inverted this more common application of the technology in order to try to monitor the activities of naval assets in the region. A survey was conducted to assess public availability of SAR data for the period and locations in question and a series of relevant SAR images were acquired for analysis. Each tile provides documentation of vessel locations in the form of radar returns. When viewed in relation to the drift model, the SAR tiles provide a snapshot of maritime activity in the vicinity of the drifting vessel at specific moments in its trajectory.

While it is not possible to identify the specific identity of a ship based on SAR return alone, it is possible to use this data to draw some conclusions regarding the size of the ship. Since the resolution of available SAR data can only trace ships of 50 meters and above, what ultimately emerges from this analysis—circumstantial though it may be—is an image of a number of very large vessels in and around the area where the migrants' boat was adrift. In the context of the maritime embargo that was in full effect at the time, and given that normal commercial shipping activity was limited, the question ultimately becomes: are the radar returns showing the position of military assets? And if so, to whom do they belong?

In response to these questions, informed guesses regarding the specific identity of the ships and helicopters encountered by the migrants were made on the basis of the description provided by the survivors and information gathered from official military documents and statements, news reports, and plane- and ship-spotters websites.

Fig. 16. The Italian Coast Guard issued an Inmarsat-C EGC at 18:54 GMT on March 27, 2011, indicating the position of the migrants' boat and their situation of distress. The Italian Coast Guard based coordinates on the migrants' satellite phone calls. All Thuraya satellite phones, such as the one used by the migrants, are equipped with a GPS receiver that periodically transmits their locations to a gateway, and are accurate within 100 meters. Source: Inmarsat-C Gateway.



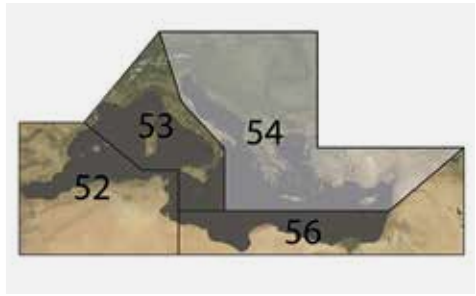


Fig. 17. The Broadcast Areas 52, 53, and 56 where the HYDROLANT alert was transmitted are highlighted on this map. Visualization by Forensic Architecture and SITU Research, based on an image from National Geospatial-Intelligence Agency.

(281114Z MAR 2011)

HYDROLANT 512/2011 (52,53,56)

(Cancelled by HYDROLANT 637/2011)

EASTERN MEDITERRANEAN SEA.
VESSEL, 68 PERSONS ON BOARD, IN NEED OF ASSISTANCE
IN 33-58.8N 012-55.8E AT 271652Z MAR. VESSELS
IN VICINITY REQUESTED TO KEEP A SHARP LOOKOUT,
ASSIST IF POSSIBLE. REPORTS TO MRCC ROME,
INMARSAT-C: 424744220,
PHONE: 390 6592 4145 OR 3906 5908 4409,
FAX: 390 6592 2737 OR 3906 5908 4793,
E-MAIL: UFFICIO3.REPARTO3@MIT.GOV.IT.

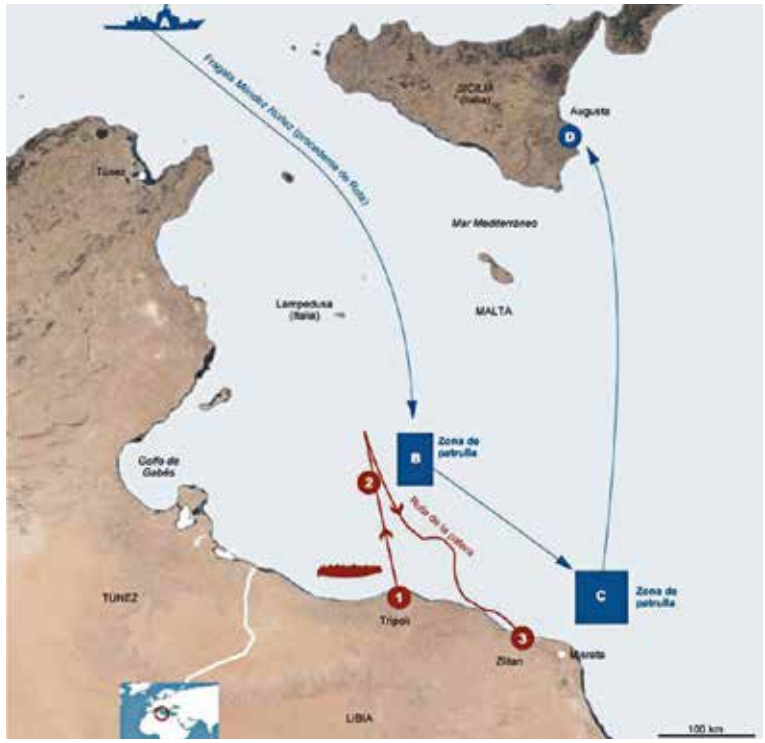
Fig. 18. A second alert containing the same information was broadcast in the form of a HYDROLANT alert at 04:06 GMT on March 28, 2011. It called for all vessels in the vicinity of the Sicily Straight to keep a "sharp look out" for a "vessel in need of assistance." Source: National Geospatial-Intelligence Agency.

Assessing available information on the migrants' distress

Finally, the analysis turned to assessing, firstly, which actors were initially informed of the migrants' distress and, secondly, whether military actors operating in the NATO maritime surveillance area might have had the technical capability to detect the migrants' boat while it was drifting. This evaluation was important because international law obliges seafarers to rescue anyone in distress at sea if informed of their distress.[6]

In order to answer the first question, we reconstructed the way in which information about the distress of this boat circulated among the various actors involved. Firstly, we conducted an interview with Father Mussie Zerai, the Eritrean priest who had initially received the migrants' distress call and had subsequently called several state agencies. We also consulted official statements (made at press conferences and in correspondence between Senator Tineke Strik and government officials) referring to the communication between parties concerning the migrants in distress. Finally, we inquired into the technical characteristics of the maritime distress signals that were sent out by the Italian Maritime Rescue Coordination Center and mapped the extension of their reach. Based on these elements, we determined that all vessels in the area—including naval assets under NATO command and those operating under their respective national commands—should have been informed of the position of the migrants' vessel and the distress of its passengers.

With regard to the second question, we analyzed a vast quantity of military statements and documents relating to the remote sensing capacity in the area. In addition to this, we attempted to determine the spatial extent of the remote sensing technologies onboard specific assets and found that aerial and naval assets deployed at the time had previously been capable



The maps produced by Forensic Oceanography have circulated widely in the international press, in activist circles, and in legal and political documents. Each time slightly modified, cropped, deformed, misspelled, and redrawn, they have allowed for the discussion around this case to happen across different arenas.

Fig. 19. Map on the online edition of *El Pais*. Map author: Rodrigo Silva. Article: Miguel González, "La OTAN tardó 18 horas en alertar a la fragata española de una balsa a la deriva," May 2, 2012.



Fig. 20. Map on the online edition of BBC News. "Nato 'failed to aid' Libyan migrant boat – Council of Europe report," March 29, 2012.

of detecting small rubber boats similar to that used by the migrants. This allowed us to conclude that the states participating in the military intervention had the means to detect the drifting boat, and that detecting such an unidentified vessel with anomalous behavior was precisely the task assigned to numerous assets monitoring the embargo area.

Fig. 21. Interactive map on the online edition of the *Guardian*. Paddy Allen, "Migrant boat tragedy – interactive," March 29, 2012.



Summary of results

Our report sought to combine qualitative and quantitative information into a single analysis so as to provide as comprehensive a picture of the chain of events as possible and to assess the degree of involvement of all parties implicated. To this end, testimony and geospatial data were combined and cross-referenced, official documents and news reports analyzed, and the technical characteristics of maritime distress signals and satellite phone calls examined. The result is a synthetic approach to the model of the human rights report that draws upon varied and disparate forms of evidence.

While we were unable to determine the identity of the helicopter and vessel that entered into direct contact with the migrants in distress, we were able to confirm that the account of the survivors was highly accurate. We established with certainty that the Italian and Maltese Maritime Rescue Coordination Centers, as well as NATO command, were informed of the location and distress of the migrants, and that there were several naval assets in the vicinity of the boat that had the ability to detect and assist it. None of these actors intervened in a way that could have averted the 63 deaths.

Legal challenges

The ultimate destination of this report has been a series of legal cases regarding non-assistance to people in distress at sea led by a coalition of NGOs. While it has been deemed impossible to bring NATO to court for this case due to its status of immunity, the legal strategy has been to file different cases in the national courts of each of the states participating in the military operations against Libya. A complaint "against persons unknown" was initially lodged before the section of the Paris High Court (*Tribunal de grande instance*) specializing in military cases in April 2012, after a similar procedure in Italy. After the decision of the Paris Prosecutor's Office to take no action on this initial complaint, the survivors and NGOs initiated proceedings in France and Spain as civil parties. Both these actions have been dismissed and appeals have been filed against these decisions. A complaint was further launched in Belgium. Finally, Freedom of Information requests have been submitted in Canada, the US, and the UK. Should these states fail to investigate the incident comprehensively, the case may be brought to the European Court of Human Rights.

Outcomes

In line with the practice of strategic litigation, beyond the goal of holding accountable those individuals, states, and organizations that failed to assist the people onboard the "left-to-die boat," the broader aim of the investigation has been to draw greater attention to the systemic and long-standing issue of migrant deaths at sea in the Mediterranean and the impunity that surrounds the perpetrators of human rights violations committed against migrants at sea.

Whereas the report has been primarily directed towards the legal sphere, its contents have circulated in a much wider arena. In particular, Human Rights Watch has sent several information requests to the actors involved in this case based on the evidence we generated, and some of our visualizations were included in the above-mentioned report by the Dutch Senator Tineke Strik. The analysis, maps, and images generated by our report have also been widely circulated within the international press.

Finally, an additional outcome of the report has been the attempt by ourselves and others to replicate the use of such innovative methodologies in relation to other incidents involving the deaths of migrants and the violation of their rights at sea. In particular, Forensic Oceanography has collaborated with a network of NGOs to create "WatchTheMed," an online and participatory mapping platform, so as to enable the migrants' rights movement to exercise a civilian right to look at the sea.[7]

1 UNHCR, "Mediterranean takes record as most deadly stretch of water for refugees and migrants in 2011," Briefing Notes, January 31, 2012, http://www.unhcr.org/4f27e01f9.html.

2 The main text framing this obligation is the United Nations Convention on the Law of the Sea, December 10, 1982, 1833 U.N.T.S. 397 (UNCLOS), which states in Article 98 (1): "Every State shall require the master of a ship flying its flag, in so far as he can do so without serious danger to the ship, the crew or the passengers: (a) to render assistance to any person found at sea in danger of being lost; (b) to proceed with all possible speed to the rescue of persons in distress, if informed of their need of assistance, in so far as such action may reasonably be expected of him."

3 The list of organizations belonging to this coalition includes: The Aire Centre, Agenzia Habeshia, Associazione Ricreativa e Culturale Italiana (ARCI), Associazione per gli Studi Giuridici sull'Immigrazione (ASGI), Boats4People, Canadian Centre for International Justice, Coordination et initiatives pour réfugiés et immigrés (Ciré), Fédération internationale des ligues des droits de l'Homme (FIDH), Groupe d'information et de soutien des immigrés (GISTI), Ligue belge des droits de l'Homme (LDH), Ligue française des droits de l'Homme (LDH), Migreurop, Progress Lawyers Network, Réseau euro-méditerranéen des droits de l'Homme (REMDH), and Unione Forense per la Tutela dei Diritti Umani (UFTDU).

4 For the full report, see http://www.forensic-architecture.org/publications/report-on-the-left-to-die-boat/.

5 Parliamentary Assembly, Council of Europe, "Lives lost in the Mediterranean Sea: who is responsible?," March 29, 2012, http://www.assembly.coe.int/CommitteeDocs/2012/20120329_mig_RPT.EN.pdf.

6 See Article 98 (1) of the UNCLOS quoted in note 2 above.

7 http://www.watchthemed.net.

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Collaborating Organizations
The Aire Centre, Agenzia Habeshia, Associazione Ricreativa e Culturale Italiana (ARCI), Associazione per gli Studi Giuridici sull'Immigrazione (ASGI), Boats4People, Canadian Centre for International Justice, Coordination et initiatives pour réfugiés et immigrés (Ciré), Fédération international des ligues des droits de l'Homme (FIDH), Groupe d'information et de soutien des immigrés (GISTI), Ligue belge des droits de l'Homme (LDH), Ligue française des droits de l'Homme (LDH), Migreurop, Progress Lawyers Network, Réseau euro-méditerranéen des droits de l'Homme (REMDH), and Unione Forense per la Tutela dei Diritti Umani (UFTDU)

Liquid Traces: Investigating the Deaths of Migrants at the EU's Maritime Frontier

Charles Heller and Lorenzo Pezzani



Fig. 1. The waters of the Central Mediterranean, as seen from the coast of the Italian island of Lampedusa, July 2013. Photo: Charles Heller.

If geography expresses in its very etymology the possibility to write and therefore read the surface of the earth, the liquid territory of the sea seems to stand as the absolute challenge to spatial analysis. The waters that cover over 70 % of the surface area of our planet are constantly stirred by currents and waves that seem to erase any trace of the past, maintaining the sea in a kind of permanent present. In Roland Barthes' words, the sea is a "non-signifying field" that "bears no message."[1] Furthermore, its vast expanse and the lack of stable habitation on its surface lead events at sea to occur mostly outside of the public gaze and thus remain unaccounted for. The deaths of migrants at sea and the violation of their rights are no exception. While between 1988 and November 2012 the press and NGOs reported more than 14,000 deaths at the maritime frontier of the EU—including more than 7,000 in the Sicily Channel alone—the conditions in which these occur have rarely been established with precision and the responsibility for them has seldom been determined. Many

more lives have been lost without being recorded other than in the haunting absence experienced by their families.[2]

It is in relation to the challenges posed across this liquid frontier that we started the *Forensic Oceanography* project in summer 2011 in an attempt to document the deaths of migrants at sea and violations of their rights.[3] This endeavour was spurred by the new demands for accountability that emerged in the aftermath of the Arab Spring, which represented a moment of paroxysm and rupture in a number of respects. The revolution in Tunisia and the civil war in Libya led to the sudden reopening of the central Mediterranean's clandestine migration routes. While this context saw an intense movement of people, the precarious conditions in which the crossings occurred led to a record number of deaths. However, as we will see, these deaths occurred while this very maritime space was being monitored with unprecedented scrutiny due to the NATO-led military intervention in Libya. The crossings and deaths were occurring in a space populated by a large number of Western states' military ships and patrol aircraft, and there were strong indications that military forces were failing in their obligation to rescue migrants in distress, despite possessing the requisite means of surveillance to witness their plight.

This was particularly apparent in the incident now known as the "left-to-die boat" case, in which sixty-three migrants lost their lives while drifting for fourteen days in the NATO maritime surveillance area, despite several distress signals relaying their location as well as repeated interactions, including at least one military helicopter visit and an encounter with a military ship.[4] By precisely reconstructing these events and the involvement of different actors within them, we demonstrated that traces are indeed left in water, and that by reading them carefully the sea itself can be turned into a witness for interrogation. The contemporary ocean is in fact not only traversed by the energy that forms its waves and currents, but by the different electromagnetic waves sent and received by multiple sensing devices that create a new sea altogether. Buoys measuring currents, optical and radar satellite imagery, transponders emitting signals used for vessel tracking and migrants' mobile phones are among the many devices that record and read the sea's depth and surface as well as the objects and living organisms that navigate it. By repurposing this technological apparatus of sensing, we have tried to bring the sea to bear witness to how it has been made to kill.

Migrants do not only die at sea but through a strategic use of the sea. As this particular incident exemplifies, even when they drown following a shipwreck or starve while drifting in its currents, there is nothing "natural" about their deaths. Following Elisabeth Grosz, the sea, like any geographic environment, can be considered to be endowed with a "geopower" that "refers to forces that precede, enable, facilitate, provoke and restrict 'life'," but conversely political practices shape the way this geopower operates, and affect the ways some are empowered and others restricted by that power.[5] Our project thus could not limit itself to reading the sea in order to document specific incidents, but demanded that we attempt to understand the conditions that have led the sea

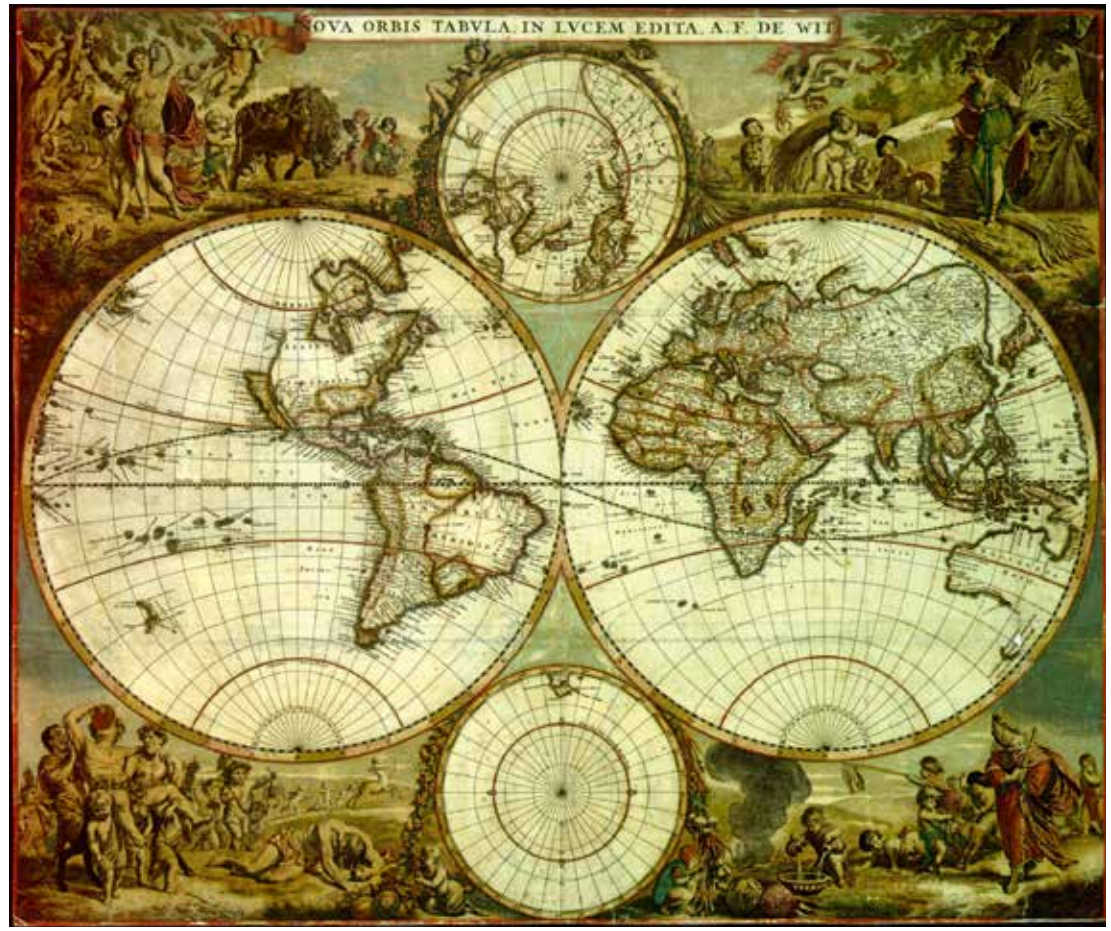


Fig. 2. *Nova Orbis Tabula in Lucem Edita*, Map of the world by Frederik de Wit, 1662, Bibliothèque royale de Belgique. Source: Wikimedia Commons.

to become so deadly. As we will demonstrate, the Mediterranean has been made to kill through contemporary forms of militarized governmentality of mobility which inflict deaths by first creating dangerous conditions of crossing, and then abstaining from assisting those in peril. This governmentality is shaped by the complex legal structure and mode of governance of the sea that enables state actors to selectively expand or retract their rights and obligations. What emerges from these conditions is a form of violence that is diffused and dispersed among many actors and which often, as in the case we have investigated, operates less through the direct action of a singular actor than through the inaction of many. As a consequence of this form of systemic violence, the specific responsibility for deaths and violations at sea is difficult to detect and prove. Before describing the strategies and methodologies we applied to collect the testimony of the sea so as to reconstruct the "left-to-die boat" case and others, it is first necessary to chart the broader political, juridical, and technological conditions through which the sea was made to kill—conditions that we have mobilized against the grain in the task of breaching the impunity of the actors involved.

Maritime Governance: Beyond the "Freedom v. Enclosure" Divide

In "The Nomos of the Earth" the German jurist and political theorist Carl Schmitt epitomized a vision of the sea as an anarchic space in which the impossibility of drawing long-standing and identifiable boundaries made it equally difficult for European states to establish a durable legal order or found claims of sovereignty.[6] "The sea," he wrote, "has no character, in the original sense of the word, which comes from the Greek *charassein*, meaning to engrave, to scratch, to imprint."[7] On this note, Schmitt based the fundamental distinction on which geopolitics has been predicated for many years: the binary division between a solid land, where territories can be clearly demarcated and where order may be imposed, and a sea where borders can be neither traced nor held and where freedom reigns absolute. This opposition found its expression in the evolution of maps of the world which, from the early seventeenth century onwards, tended to represent (European) land in great detail in terms of geographic morphology, human built environment and political boundaries, but signified the territory of the surrounding sea as an abstract and frictionless geometric space open to navigation (see fig. 2).[8]

While idealizations of the sea as empty and lawless still persist today,[9] recent scholarship on maritime governance tells us a different story, in which the oceans have long been crisscrossed by multiple regimes of appropriation and juridical differentiation.[10] Geographer Philip Steinberg in particular has shown how maritime governance imposed by (Western) states and capital has oscillated throughout modernity between two poles: on the one hand, the desire to divide up the waters of the earth in a way that would mirror the carving up of territorial boundaries on land; on the other, the vision of the oceans as commons, open to free navigation—the "free seas." However, rather than an either/or application of these seemingly opposed tendencies, what we observe throughout this period is rather their productive entanglement.[11]

This productive tension is at work in one of the founding moments of maritime law, commonly referred to as the "Battle of the Books" (1580—1650), which centred around the opposition between the vision of a free sea expressed by the Dutch jurist Hugo Grotius in his 1609 text *Mare liberum* ("the free sea") and the defense of maritime division and control formulated by the English scholar John Selden in *Mare clausum* ("the closed sea") in 1635.[12] But this apparent contrast conceals a deeper convergence. While Selden, by noting that "mare clausum can go only so far as one can assert effective control," endorsed negatively the idea of freedom for the high seas,[13] the concept of the "freedom of the seas" coined by Grotius routinely led to the use of coercion to ensure the smoothness and security of trade routes or block those of competitors.[14] As Philip Steinberg writes, "freedom requires policing and mobility requires fixity, and both of these activities require continual efforts to striate the ideally smooth ocean."[15]

For both poles in the governance of the seas, the ability to map, measure, and exercise surveillance over the maritime space was fundamental. This knowledge did not precede its application in the service of power, but was inextricably bound to war, trade, and imperialism in its very production. It was the coupling of scientific epistemologies and Western commercial and military networks spanning the globe that enabled systematic measurements to be sampled across vast distances, and generated increasingly detailed knowledge of the winds, currents, tides, depths, landmasses, and living organisms that constitute the ocean's global system.[16] This understanding of the seas was essential to secure and fast navigation, as well as to charting maritime territory and life in a way that would eventually enable its division, exploitation and regulation.

While Carl Schmitt was indeed right to state that the sea itself cannot be carved up and possessed as land, the same is not true of the resources located within the water and in the soil under it, or the traffic that floats on its surface. By going beyond his land—sea binary and by being attuned to the vertical dimension of maritime spaces, we are able to decipher a much more complex form of governance than the simple opposition between territorial control and deterritorialized flow.

The tension between and coexistence of the tendencies of enclosure and freedom in the governance of maritime space have resulted in, on the one hand, a form of unbundled and spatially variegated sovereignty, and on the other a governance in motion that seeks to compensate for the impossibility of controlling the entire liquid expanse by focusing on the control of maritime routes and the mobile people and objects that ply them. Whereas in 1702 the extension of the territorial waters could be defined by Cornelius Bynkershoek as the area covered by coastal states' cannon-shot range, with the governance of routes largely dependent on the presence of ships along key corridors, today a far more complex jurisdictional regime and mode of governance has been enabled by the contemporary technological apparatus discussed below, which transforms the maritime space into a dense and extensive "sensorium."[17] In this situation, as we will see with reference to the Mediterranean, multiple lines of enclosure that run parallel to the coastline and dissect the surface and volume of the ocean into partial sovereignty regimes intersect with diagonal and ever shifting lines of control that attempt to follow routes of maritime traffic. These sets of lines do not simply coexist for, as we will see, the carving up of partial sovereignty regimes is the very legal basis for governance in motion to expand and retract selectively in policing the "free seas."

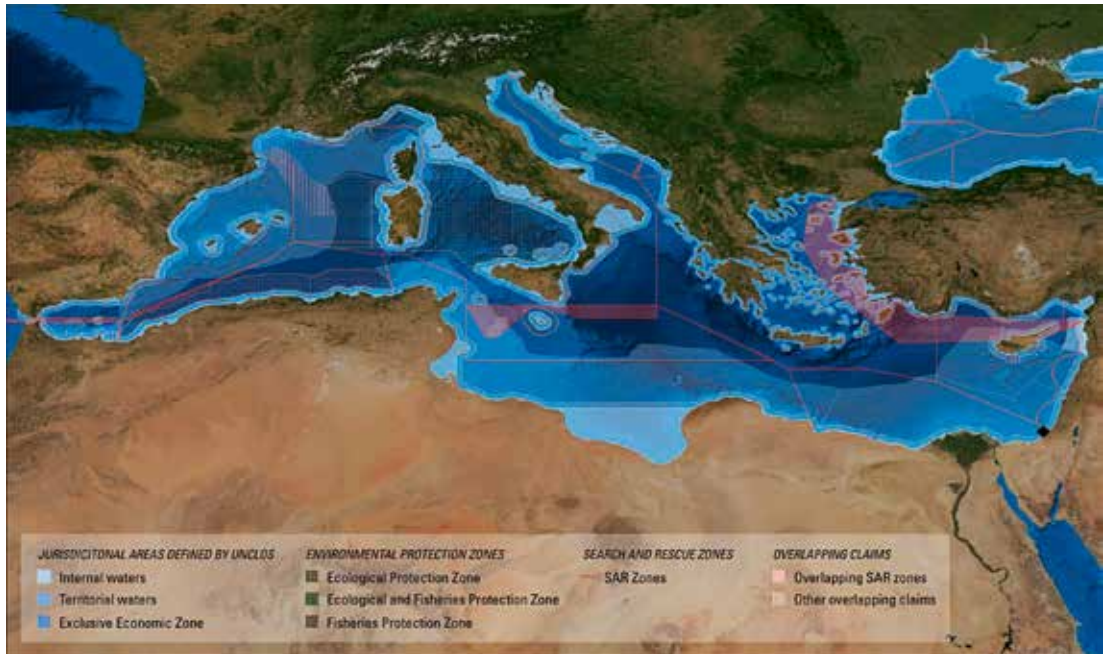


Fig. 3. Map of maritime jurisdictions in the Mediterranean. Based on data compiled by www .marineplan.es and the International Maritime Organization. Design: Lorenzo Pezzani.

Lines of Enclosure: Unbundled Sovereignty at Sea

The successive stripes of jurisdiction, which, by dissecting both surface and volume of the sea determine the current legal architecture of maritime territories, are mainly codified by the 1982 United Nations Convention on the Law of the Sea (UNCLOS).[18] After establishing the criteria for determining the position of the so-called "baseline"—the ideal line that usually corresponds to the low-water line along the coast—the convention further defines several jurisdictional zones, over which states exercise decreasing degrees of control and exclusive privilege. These include, among others, "territorial waters" that extend up to twelve nautical miles from the baseline within which states have full sovereignty; the "contiguous zone," covering up to twenty-four nautical miles and within which states may further exercise certain border police functions; the "exclusive economic zone" (EEZ), which may delimit a zone up to two hundred nautical miles from the baseline, within which coastal states have exclusivity over natural resources both in the water (such as fish) and under the soil (such as gas or oil). Beyond this zone lie the "high seas," where no state can exercise its full sovereignty nor subject any part of them to its jurisdiction. While the high seas are "free for all states and reserved for peaceful purposes," they do not become as a result a legal vacuum, since the rights and obligations of each actor and state are framed by international law. The jurisdiction of states applies to boats flying their respective flags,

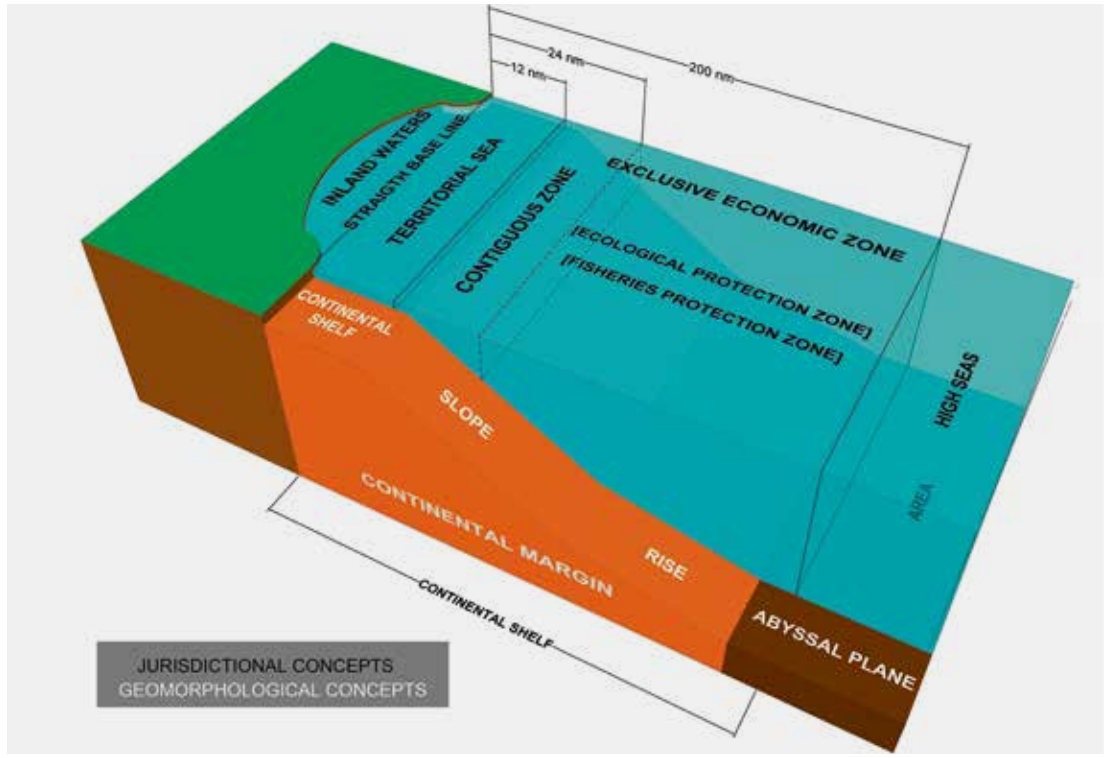


Fig. 4. Maritime jurisdictional concepts. Source: Juan Luis Suárez de Vivero, "Jurisdictional Waters in The Mediterranean and Black Seas" (European Parliament, 2010), p. 27.

and each boat thus becomes a small piece of floating state jurisdiction, transforming the high seas into an international space in the strongest sense, since all states are potentially in contact with each other.[19] Finally, vessels and coastal states also have particular obligations: among these, of central relevance for our investigation into the "left-to-die boat" case, are the duty of vessels to provide assistance to people in distress, and the obligation of coastal states to coordinate rescue operations. For this purpose, Search and Rescue (SAR) zones have been established across the high seas, delimiting the geographic areas within which particular states have a legal responsibility to coordinate rescue operations.[20]

What emerges from this process of enclosure of the high seas by various and sometimes competing jurisdictional regimes, is the image of a space of unbundled sovereignty, in which the rights and obligations that compose modern state sovereignty on the land are decoupled from each other and applied to varying degrees depending on the spatial extent and the specific issue in question.[21] As a result, a patchy legal space constituted by overlapping and often conflicting fragments has emerged. The Mediterranean is a paradigmatic example of this phenomenon, which is therein reproduced at a smaller scale but with increased rapidity and intensity. Until recently, most Mediterranean states had refrained from extending exclusive claims beyond their territorial waters, for fear of getting entangled in thorny legal conflicts and of reducing the navigational advantages guaranteed by the high seas. Since

the beginning of the 1990s however, under changed geopolitical conditions, the Mediterranean has entered a phase of accelerated juridicalization, and zones of exclusive maritime use have proliferated, extending national jurisdiction into what used to be high seas.[22] These are zones of environmental protection and resource conservation which are often not even provided for by the UNCLOS, but which further subdivide the high seas according to specific functions such as fishing, ecological and archaeological protection. The complexity of these maritime jurisdictions has in turn created numerous disputes which involve states as well as fishing, oil, and shipping companies and which are often fought through scientific campaigns to map and measure the size of fisheries, the morphology of the seabed, and the presence of minerals located under it.[23]

These overlaps, conflicts of delimitation, and differing interpretations that have been the by-product of the recent carving up of the sea are less malfunctions than an exacerbated expression of the structural condition of global law, which, as Gunther Teubner and Andreas Fischer-Lescano have argued, results from deep contradictions between colliding sectors of a global society.[24] Furthermore, as we will see in relation to the policing of illegalized migrants at sea, this condition has become an integral part of the capacity of states and other actors to apply rights and abide by obligations at sea selectively according to their interests, expanding and retracting their jurisdictional claims at will—for example to intercept migrants or to evade the obligation to rescue people in distress. This unbundled and elastic sovereignty is key to the operations of the mobile governance exercised to police the so called "freedom of the seas."

Fig. 6. (opposite) This map, produced by the European Commission Joint Research Centre, shows the density of Synthetic Aperture Radar images available in 2001 across the Mediterranean Basin. Source: D. Tarchi, oil spills statistics in the Mediterranean, PowerPoint presentation at the specialized training course on oil pollution monitoring, November 2006.

Fig. 5. (below) Finmeccanica PowerPoint slide from "Dal VTS al VTMIS," 2007. The graphic presents the "Vessel Traffic Management and Information System" (VTMIS).



Lines of Control: Governance in Motion through Scopic Systems

In addition to the lines of enclosure running parallel to the coastline discussed above, the Mediterranean is crisscrossed by diagonal and ever shifting lines of control that emerge as maritime governance attempts to follow routes of maritime traffic and police the "freedom" of the high seas. As Michel Foucault had already noted in the late 1970s, this inextricable articulation between freedom and control is characteristic of forms of mobility governance in (neo)liberal societies, which operate by "maximizing the positive elements,

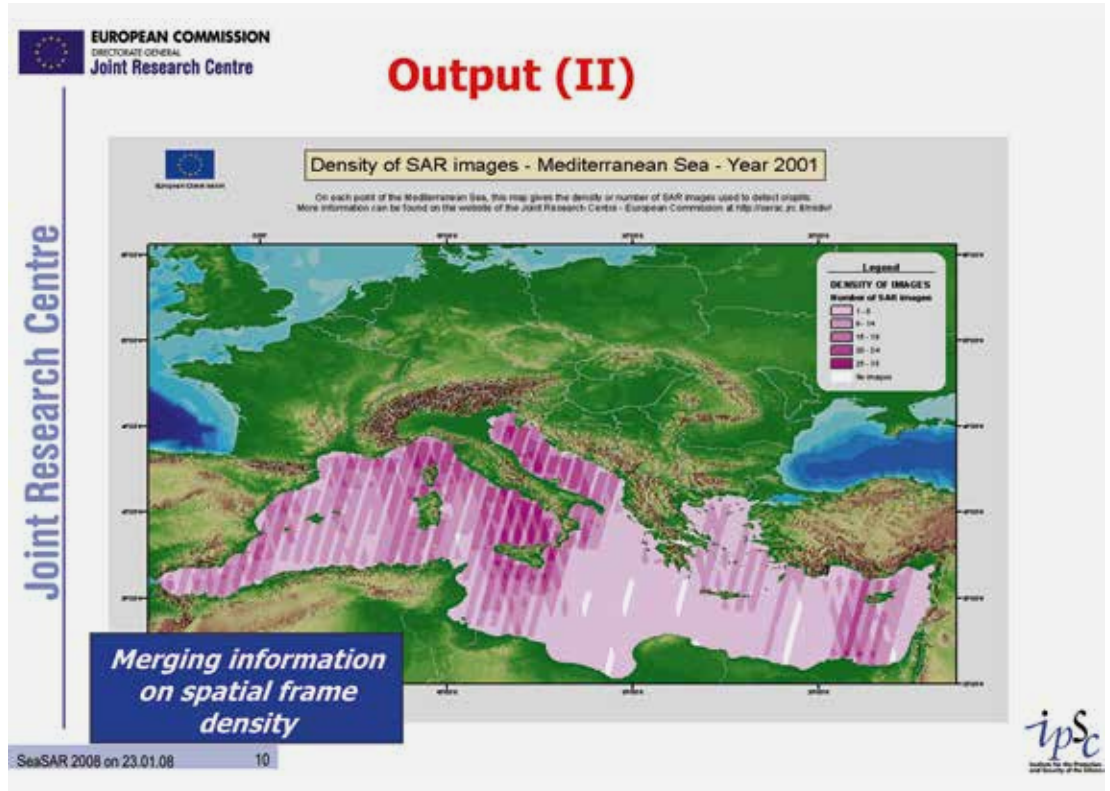




Fig. 7. (opposite) Screenshot of one of the live online vessel tracking portals, which gathers and presents live AIS data. Source: www.marinetraffic.com.

for which one provides the best possible circulation, and [by] minimizing what is risky and inconvenient, like theft and disease, while knowing that they will never be completely suppressed."[25] While the Mediterranean's waters are central to global trade—with an estimated total of 200,000 commercial ships crossing it annually[26]—this dense traffic and the maritime space itself are perceived though the lens of security as being constantly under threat: from international terrorism, criminality, illegal fishing, pollution, and, of course, illegalized migration. To detect threats amidst the productive flow of vessels and goods, states deploy means of surveillance, military and border patrols, and rescue agencies. In addition to national initiatives, NATO's Operation Active Endeavour was launched in the wake of 9/11 to act as a deterrent and protect civilian traffic in the Mediterranean. Policing has thus become an increasingly structural part of the supposed freedom of the high seas. The exercising of the "right of visit" is an indication of this. While according to the UNCLOS this right allows officials to board a vessel in the high seas in "exceptional circumstances," it has come to be used to justify an increasing number and array of interventions, including the routine interception of migrants.[27] Nevertheless, the deployment of aerial and naval forces remains insufficient to police the vast waters of the Mediterranean. The sorting out of "bad" traffic from large quantities of "good" mobilities within an extremely vast space necessitates the assemblage of a sophisticated and increasingly automated technological apparatus of surveillance.



Fig. 8. Aerial video of a migrants' boat recorded and published online by the Italian border police. Source: "Lampedusa: Immagini inerenti l'attività della Guardia di Finanza a contrasto dell'immigrazione clandestina," September 17, 2011, http://youtu.be/E1eB--bK6w4.

For the purposes of surveillance, the coasts of the Mediterranean, as well as state-operated vessels, are equipped with radars that scan the horizon around them by sending out high-frequency radio waves that are bounced back to the source wherever they encounter an object, indicating these "re-turns" as an illuminated point on a monitor. Automated vessel-tracking data for large commercial ships (AIS) or for fishing boats (VMS) is sent out by a transponder on board via the VHF radio frequency and captured either by coastal or satellite receivers, providing a live view of all registered vessels.[28] Optical satellites generate imagery by capturing reflected energy of different frequencies such as visible and infrared light, while satellites equipped with synthetic—aperture radar (SAR) emit a radio signal and create an image based on the variations in the returns. Both "snap" the surface of the sea according to the trajectory of orbiting satellites and are used to detect unidentified vessels or track pollution. The constant emission and capture of different electromagnetic waves these technologies utilize confers a new material meaning on Fernand Braudel's metaphor of the Mediterranean as an "electromagnetic field" in terms of its relation to the wider world.[29] These technologies do not simply create a new representation of the sea, but rather constitute a new sea altogether, one which is simultaneously composed by matter and media. The current aim of different agencies striving to govern the sea is to assemble these different technologies so as to achieve the most complete possible "integrated maritime picture." This is both a technological and institutional challenge, since it requires the interoperability of agencies from different countries (both within and outside the EU) across different fields of activity. Through this assemblage emerges what Karin Knorr Cetina has called, with reference to financial markets, a "scopic system": "When combined with a prefix, a scope (derived from the Greek scopein, "to see") is an instrument for seeing or observing, as in periscope. […] A scopic system is an arrangement of hardware, software, and human feeds that together function like a scope: like a mechanism of observation and projection […]."[30]

While the assemblage of technologies and institutions that constitute the Mediterranean's scopic system enable a "vision" of the sea that far exceeds that of its ancestor the telescope, it is still far from producing the totalizing panoptic view that state agencies and surveillance companies regularly call for. For a start, agencies come up against their limits when faced with the huge quantity of data generated by the dense maritime traffic and the increasing deployment of remote-sensing technologies. To deal with the ensuing information overload, surveillance agencies are increasingly resorting to the use of algorithms that allow the automatic detection of "anomalies" so as to distinguish "threats" from the "normal" maritime traffic.[31] An even bigger challenge is posed by the task of detecting the kinds of small boats used for clandestine migration—such as ten-meter rubber boats or fifteen-meter wooden boats—within such a vast area. In this respect, all solutions to date have run up against the conflict between resolution and swath: while the detection of small boats necessitates high-resolution means of sensing (such as SAR satellite imagery), this can only be achieved for small geographic areas, thus leaving much of the maritime area unattended.[32] As such, the Mediterranean's scopic system operates a form of incomplete and patchy surveillance that runs up against the frontiers of information quantity and resolution.

Recognizing the impossibility of monitoring the entire space of the sea and the totality of traffic that populates it, state agencies focus the attention of their mobile governmentality on the main vectors and lines of sea crossing. At work then is a form of "viapolitics," a concept coined by William Walters to describe a politics that takes as its object routes and vehicles.[33] For Walters, "vehicles and their infrastructures are nodes, relays, surfaces, volumes in a dispersed and uneven governance of population and territory."[34] The modality of governance of the maritime frontier is thus deeply shaped by and to a certain extent consubstantial of the surveillance apparatus that enables it. For if the border exists only in its violation, the latter must first be detected either by human perception or its various technological extensions. Conversely, the strategies of invisibility enacted by clandestine migrants so as to slip though the cracks and gaps in this surveillance apparatus are essential to subverting the violent border regime that operates at sea.

The Contested Frontier: Mobile Knowledges, Elastic Borderings, and the Politics of Irresponsibility

Like the ocean, the mobility of people has proven particularly difficult to govern throughout history. In the past twenty years, severe restrictions have been imposed on the movement of people across the Mediterranean with the introduction of Schengen visas and the progressive externalization of border controls into the maritime frontier and onto North African states. This brought to an end to the phase following World War II in which "guest-worker" programs and postcolonial relations promoted the influx of migrant laborers into European countries—who frequently crossed the sea by ferry.[35] The recent restrictions to the movement of non-European migrants have however proven unsuccessful in curbing "unwanted" migration flows.[36] Migration from the southern shores of the Mediterranean has continued, but in a clandestine and precaritized form, employing, amongst other methods, the crossing by sea on unseaworthy vessels.

Those wanting to cross the Mediterranean despite being denied access to formal and legal modes of doing so had to create a new transport infrastructure, constituted as much by actual vessels as by interpersonal relations

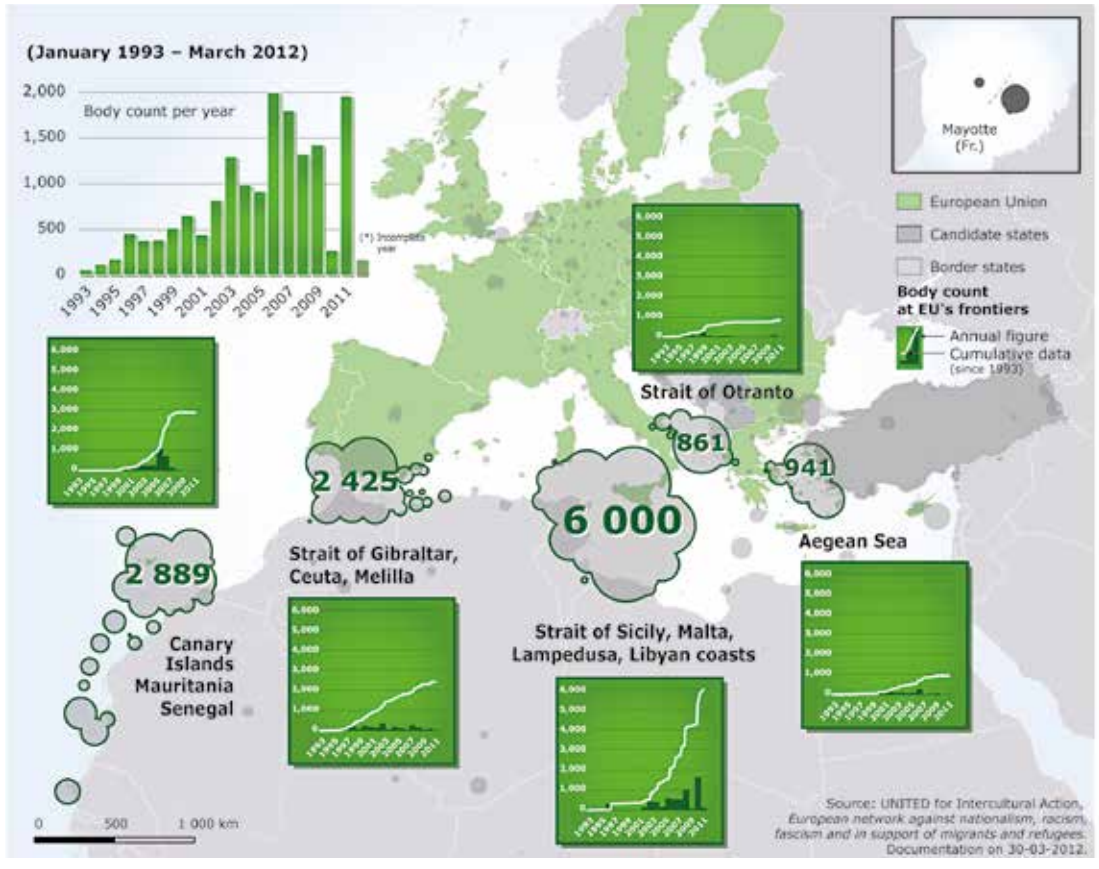


Fig. 9. Deaths at the Borders of Europe. Source: Migreurop, *Atlas of Migration in Europe: A Critical Geography of Migration Policies* (London: New Internationalist Publications, 2013).

and knowledge of borders. Faced with governmental agencies' interlinking of their means of surveillance to form an "integrated maritime picture" so as to control mobility, illegalized migrants developed their own social network through which information and services are exchanged.[37] As the work of the sociologist Mehdi Alioua has shown, contrary to common perception, resorting to smugglers is usually limited to particularly difficult stages in the crossing of borders, whereas the majority of migrants' trajectories are organized autonomously and collectively. Through their mobility, migrants progressively generate a shared knowledge, which allows them to orient themselves in new environments and know where and how to cross borders undetected.[38] This collective knowledge and practice of border crossing has a deep and ambivalent aesthetic dimension, in that it hinges on the conditions of appearance of migrants.[39] The very term "clandestine," from the Latin *clandestinus* meaning "secret" or "hidden," points to their aim to circulate undetected—literally, under the radar; this is also why most crossings begin at night. However this desire to go undetected is always weighed against the risk of dying unnoticed at sea, as in the "left-to-die boat" case when, in distress, the migrants did everything they possibly could to be noticed and rescued.[40]

In response to the continued capacity of illegalized migrants to reach the southern shores of Europe, through a series of policies and practices the Mediterranean was progressively militarized and transformed into a frontier area that allows border operations to both expand and retract far beyond the legal perimeter of the EU, thus adding further friction to the mobility of migrants.

In an important report submitted in 2003 to the EU Commission by CIVIPOL—a semi-public consulting company to the French Ministry of the Interior—the authors explain that in order to "hold a maritime border which exists by accident of geography," it is necessary to go well beyond an understanding of the maritime border as delimited by EU states' territorial waters.[41] To exploit the geopower of the sea and use its physical characteristics to reinforce the border, surveillance has to cover "not just an entry point, as in an airport, nor a line, such as a land border, but a variable-depth surface."[42] The unbundled sovereignty at work in the high seas enabled European and non-European coastal states—assisted since 2001 by NATO as part of its "Operation Active Endeavour" and since 2006 by Frontex (the European border management agency)—to deploy maritime border patrols using boats, helicopters, airplanes, and the aforementioned surveillance technologies to intercept incoming migrants.

Through these means of governance in motion, the line of the border has become elastic, expanding and retracting with the movement of patrols. However, the increasing militarization of the maritime frontier of the EU has not succeeded in terms of the stated aim of stopping the inflow of illegalized migrants, but rather has resulted in the splintering of migration routes towards longer and more perilous areas of crossing.[43]

It is thus the strategic use of the maritime environment as a frontier zone that has turned the sea into an unwilling killer. The fact that such policies remain active despite policy makers' knowledge of their "failure" is a reminder of the productive dimension of illegalized migration. It makes it possible for governments to engage in a never ending "war on migration" whose benefits include attracting the populist vote, keeping the surveillance and military industries buoyant, and, last but not least, providing the labor market with a ready supply of de-qualified and precaritized laborers. This is the obscene supplement of the spectacular scene of border enforcement to which Nicholas De Genova rightly draws our attention.[44]

As a result of these policies and militarized practices, once travelling at sea, migrants frequently find themselves in difficult situations of distress, due to a variety of factors such as failing motors, vessel overload, or loss of direction. However, as soon as they enter the Mediterranean Sea, they enter a space of international responsibility. We have already noted the obligation of vessels at sea to provide assistance to those in distress, and for coastal states to coordinate rescues within their respective Search and Rescue (SAR) zones. The strategic mobilization of the notion of "rescue" has at times allowed coastal states to justify police operations in the high seas or even within foreign territorial waters for which they would otherwise have little legal ground, thus blurring the line between policing and humanitarian activities.[45] But along with rescue comes the burden of disembarkment, which in turn entails responsibility for processing possible asylum requests or deporting migrants in accordance with the so-called Dublin Regulation.[46] To avoid engaging in rescue missions, states have strategically exploited the partial and overlapping sovereignty at sea and the elastic nature of international law.[47] The delimitation of SAR zones has been the first battlefield. In the central Mediterranean, Tunisia and Libya have refrained from defining the boundaries of their SAR zones, while Italy and Malta have overlapping SAR zones and are signatories to different versions of the SAR convention, a situation which has led to repeated standoffs.[48] The latter have been exacerbated by the lack of clear definitions of concepts such as "distress" and "assistance" within international maritime law, enabling divergent interpretations.[49] Moreover, coastal states' unwillingness to accept the disembarkment of migrants has led to an increased reluctance on the part of seafarers to allow those in distress on board their vessels, "in some cases fearing criminal liability for being accused of facilitating illegal immigration." In such ways, the international legal norms established to determine responsibility for assisting those in distress at sea have been used precisely for the purpose of evading and deferring this responsibility. As a result, many migrants have been left unassisted, leading to human tragedies. It was precisely this politics of irresponsibility that was at work in the unfolding of the "left-to-die boat" case.

While Italy and Malta had been informed of the location and distress of the passengers, with the vessel still outside of their SAR zones (but soon to enter their zone of overlapping and conflicting responsibility), they limited themselves to sending out distress signals to vessels transiting the area and informing NATO command, which was monitoring the "Maritime Surveillance Area" within which the passengers were located.[50] However during the time of the international military intervention in Libya, NATO operated a practice of minimal assistance, the aim of which was to ensure that the migrants could continue their journey until they entered the Italian or Maltese Search and Rescue (SAR) zone so that they would become a concern for those states. While this did occur in several instances, in the case of the "left-to-die boat" the evaluation of the distress of the migrants and the minimal assistance provided to them (a helicopter visited them twice and dropped a few bottles of water and biscuits) were clearly insufficient as they soon started to drift back to the Libyan coast, left to merciless winds and currents that inflicted on the passengers a slow death.

If migrants thus die at sea from a range of direct causes such as dehydration, lack of food, the ingestion of salty water and drowning, all of which are related to the geopower of the sea, it should be clear from the above that it is through the enforcing of migration policies imposed by the EU and their articulation within a particular maritime legal and governance regime that the sea has been turned into a deadly liquid, the site and means of a rising number of deaths and structural violations of migrants' rights. What has emerged is a form of violence that is exercised less by effecting a destructive force onto a given actor, than by creating *the conditions* in which the sea becomes a liquid trap and refraining to help those who are caught in it. In this, the governmentality of migration at sea constitutes an example of a form of biopolitical power described by Foucault, which is exercised not only by actively sustaining and protecting the life of certain populations, but also by causing death of others by simply abstaining from any form of action. To paraphrase his famous summary of this form of power, one could say that the maritime border regime "makes flow and lets drown."[51] The migration regime thus produces a form of systemic violence that kills without touching and is exercised by several actors simultaneously. As a consequence, the responsibility for the deaths and violations that are its structural product is shared, diffuse, and thus difficult to address. While migrants' rights organizations have been documenting the deaths of migrants for a number of years and have denounced the deadly policy of the maritime border regime, it was not until 2011, with the radical geopolitical shifts brought about by the "Arab Spring" and the military intervention in Libya, that new possibilities for addressing this form of violence arose.

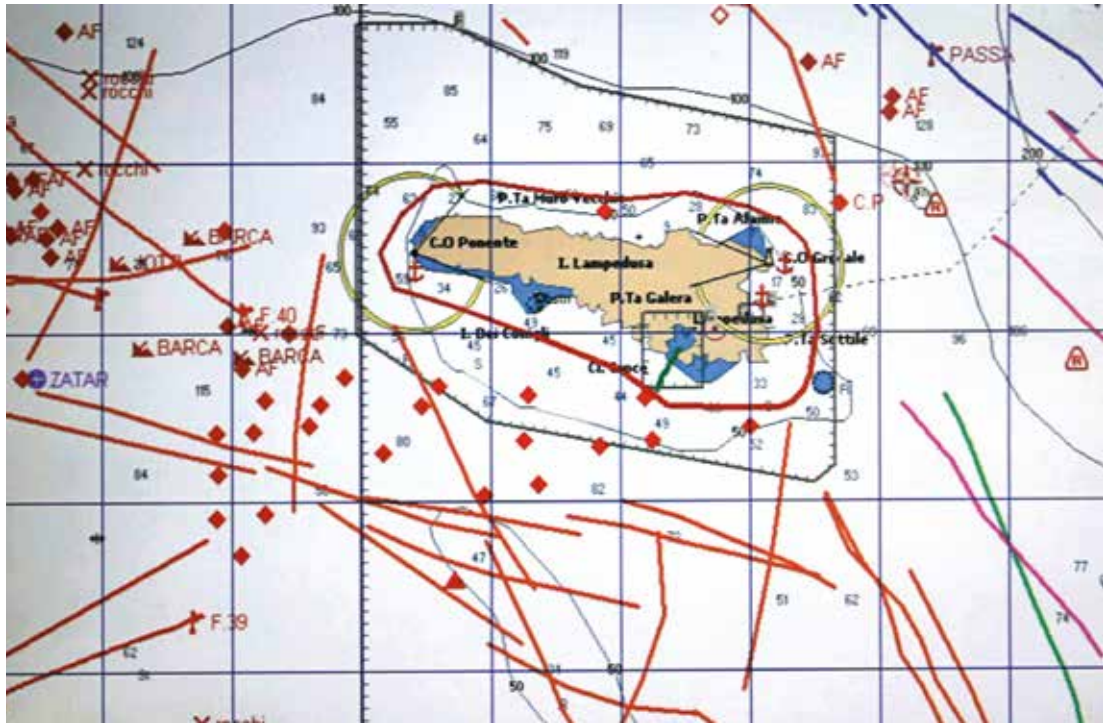


Fig. 10. Still from a video depicting the digital navigation system onboard one of the trawlers of the Mazara del Vallo fleet (Southern Sicily). The map shows the various trawling paths and the presence of obstacles (rocks and shipwrecks) around the island of Lampedusa, Mazara del Vallo, July 2012. Video: Charles Heller and Lorenzo Pezzani.

2011: Ruptures in the Migration Regime and Renewed Opportunities for Accountability

In relation to the context outlined above, 2011 represented a moment of paroxysm and rupture in a number of respects. The so-called Arab Spring led to a temporary power vacuum in Tunisia that enabled over 28,000 people to cross the sea to Italy during that year. This intense mobility in the immediate aftermath of a revolution is a clear indication that the aspiration to freedom and justice of the Tunisian people was directed not only towards the way their country was governed, but also extended towards the imposition by the EU—with the active participation of the Ben Ali regime—of a violent and discriminatory migration

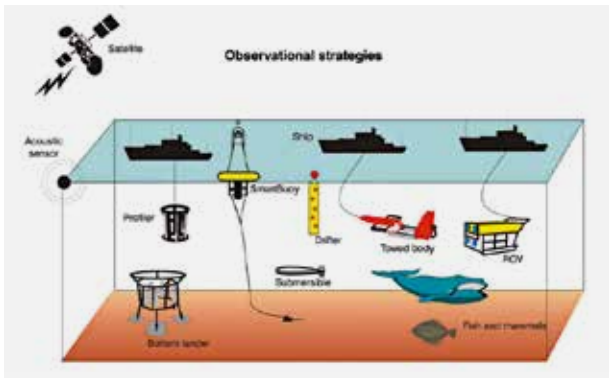


Fig. 11. Schematic overview of marine observational strategies (drawing by Irene Gooch). Source: Silke Kröger and Robin J. Law, "Biosensors for Marine Applications," *Biosensors and Bioelectronics,* vol. 20, no. 10 (April 2005): 1905.

regime within and beyond Tunisia's borders.[52] The uprising in Libya led less to the seizing of a new freedom than to forced displacement. The entrenched civil war and the ensuing NATO-led military intervention forced almost 26,000 people to cross the sea to reach the southern shores of Italy, with Gaddafi's regime playing an active role in forcing migrants onto boats with the aim of using them as weapons of war.[53] With boats loaded to the point of collapse and without regard for even the minimal safety measures usually provided by smugglers, over 1,822 recorded deaths occurred in the Central Mediterranean during 2011, one of the all—time highs.[54] However, these deaths occurred at a time when the militarization of the EU's maritime frontier had taken on entirely new dimension, with the usual agents of the low intensity "war on migration" joined by a large number of additional military ships and patrol aircraft deployed by Western states off the Libyan coast in support of the international military intervention. Their mission included the surveillance of a wide maritime space off the coast of Libya in order to enforce an arms embargo.[55]

In this context, a coalition of NGOs was formed with the aim of identifying direct responsibility for these deaths. Their claim was that, given the means deployed, it would have been impossible for military and border control personnel to have failed to witness the distress of migrants at sea.[56] The "left-to-die boat" incident provided a case in point and the coalition decided to focus on this paradigmatic incident to launch a legal case claiming liability for nonassistance of people in distress at sea. In support of this endeavor, together with the architectural practice SITU Research, we produced a seventy-three-page report which, by mobilizing a wide range of digital mapping and modeling technologies and by relying on an unorthodox assemblage of human and nonhuman testimony, reconstructed and mapped as accurately as possible what happened to this vessel.[57] Having outlined above the conditions that have turned the sea into a deadly liquid, we are now in a position to explain how we brought the sea to bear witness to the conditions that have led it to kill.

As should now be clear from our discussion of the scopic system assembled to monitor maritime traffic, it is no longer true that the sea entirely resists being written. The maritime space is constantly registered in optical and thermal cameras, sea-, air-, and land-borne radars, vessel tracking technologies, and satellites that turn certain physical conditions into digital data according to specific sets of protocols, determining the conditions of visibility of certain events, objects, or people. While many of these remote sensing means remain in the exclusive hands of states and their agencies, certain types of automated vessel tracking data ("automatic identification system," or AIS), meteorological data, as well as satellite imagery are available to the public. Moreover, parallel civilian networks also supplement these sensors: migrants frequently film their crossings with mobile phones, while networks of ship- and plane-spotters post photographs of naval activities, thereby contributing to documenting, transmitting and archiving events at sea.[58]

Through this vast process of imaging and dataization of the maritime space, the sea has become a vast and extended sensorium, a sort of digital archive that can be interrogated and cross-examined as a witness. This is precisely what we did in order to produce our report: in the absence of external witnesses, we corroborated survivors' testimonies by interrogating the very environment where these events took place, the sea itself.

But in a context in which remote sensing is so central to the process of policing illegalized migration and the success of clandestine border crossings hinges on not being detected, how to avoid becoming complicit with the governmental attempt to manage migration by shedding light on the transgression of borders? The use of these technologies and other sources of information demanded that we position ourselves strategically in relation to their usual application by border agencies. While the latter perform an ambiguous act of unveiling practices of clandestine migration while concealing the violent political and legal exclusion that produce this clandestine status in the first place, as well as the numerous legal violations the migration regime generates in turn, our approach needed to invert this strategy.[59] We aimed not to replicate the technological eye of policing, but to exercise a "disobedient gaze," one which refuses to disclose clandestine migration but seeks to unveil instead the violence of the border regime. Applying this strategy to the "left-to-die boat" investigation entailed redirecting the light shed by the surveillance apparatus away from clandestine migrants and towards the act of policing the sea, and spatializing the practices of different actors so as to reinscribe responsibility within the space of the unbundled sovereignty at sea.[60]

As described in more detail earlier in this volume, we mobilized different remote sensing technologies to reconstruct the events and determine the degree of involvement of different parties in several ways.[61] In this endeavor, it has been crucial to couple a robust understanding of the technical characteristics of these technologies with a thorough analysis of the web of economic, scientific and political relations in which they are embedded and which shape both their potential usage and the epistemological frame they impose on the world.[62] Only then was it possible to insert ourselves within the complex chain of production that their use involves, in order to locate specific nodes from where information could be extracted and repurposed towards the spatio-temporal reconstruction of the events and actors involved in the incident.

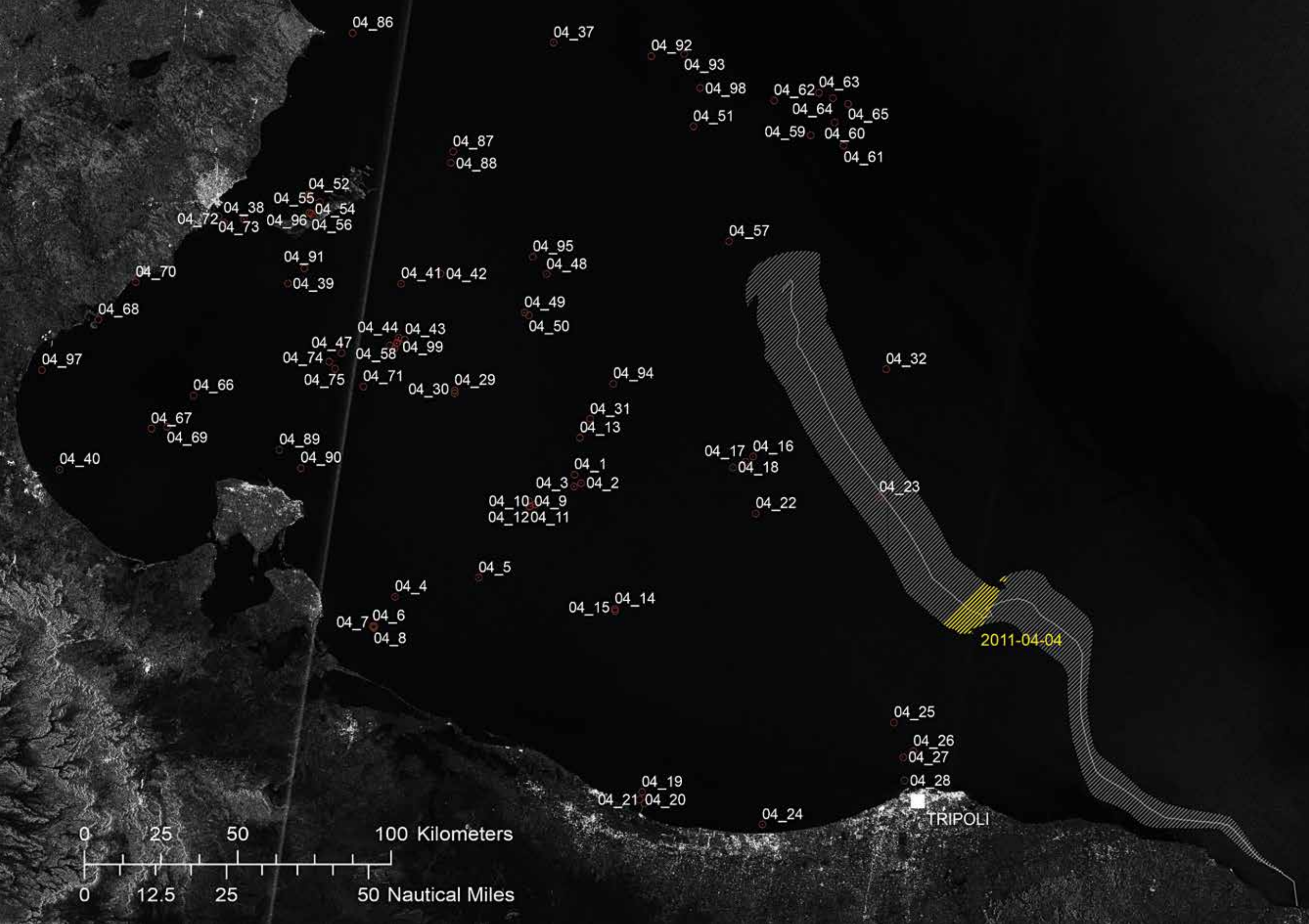
First, we reconstructed the trajectory of the migrants' boat up to its point of drift, by georeferencing the position of the migrants' distress calls using a satellite phone and by reconstructing the boat's speed and route based on detailed interviews with the survivors. But to determine the entire trajectory of the boat during its fourteen days of deadly drift, we also had to bring the winds and the currents to bear witness. An oceanographer reconstructed a model of the drifting vessel by analyzing data on winds and currents collected by buoys in the Sicily Channel.[63] In this way, we determined that the migrants' vessel remained for the majority of its trajectory within the NATO maritime surveillance area.

With the migrants' boat's trajectory determined and the knowledge of its distress by other vessels operating in the area at the time established by tracing the different distress signals that were sent out, the key question became "which ships were in its vicinity and failed to respond?" To answer this, we relied on synthetic aperture radar (SAR) satellite imagery, which, analyzed by a remote sensing specialist, allowed us to establish the presence of a number of ships in the immediate vicinity of the migrants' boat. However, the relatively low resolution of the images (1 pixel represents 50 m^2 or 75 m^2) did not allow us to locate migrants' boats (usually small wooden and plastic vessels), but only the bigger military and commercial vessels. The *resolution* of the image thus became a highly political issue, in that it determined the frontier between the visible and invisible, and separated the practice of a disobedient gaze from an uncritical act of revealing that risks complicity. In the process, not only were we using against the grain a technology usually used for surveillance, but repurposing the very images surveillance produces: the availability of those SAR images was probably due in the first place to the military operations in Libya, since there was a sharp increase in the number of available images coinciding with the days of the conflict.

In a third strategic use of surveillance technology, this time in line with the claim made by the coalition of NGOs, we turned the knowledge generated through surveillance means into evidence of responsibility. While the military had deployed exceptional means of surveillance to impose the embargo and detect any threat at sea, the knowledge they generated also made them aware of the distress of migrants—and therefore responsible for assisting them. After collecting several official statements by military officials celebrating the technical capability of the means of surveillance deployed in the Mediterranean, we carried out a detailed analysis of the range and precision of their sensing technologies in order to prove that the naval assets in operation at the time of the "left-to-die boat" case had the means to detect the drifting migrants' boat. While, as Bruno Latour reminds us, with the capacity to sense events should come "sensitivity"—the capacity to respond to them—the lack of response despite the knowledge generated by surveillance became in this case evidence of guilt.[64] In this way, we attempted to close the gap which the politics of irresponsibility tries to leave open, between the possibility of sensing a certain event (of distress) and the obligation to intervene.

Fig. 12. (overleaf) Analysis of April 4, 2011 Radarsat-1 Synthetic Aperture Radar (SAR) by Rossana Padeletti, GIS and Remote Sensing specialist. Addendum to the Report by Forensic Oceanography on the "left-to-die boat," June 2013. By overlaying the drift model of the "left-to-die boat" and underlining in yellow the position of the vessel on the day the image was taken, Padeletti's analysis demonstrated that there were 78 probable vessels of over 50 m surrounding the drifting migrants' vessel at the time in which, according to the survivors' testimony, they encountered a military vessel. There may have been further vessels present in the Eastern side of the image, which however presented too much scattering and background noise to detect possible targets.

While many questions remain open in terms of the identities of the different actors involved—crucially the two helicopters and the military ship that entered into direct contact with the migrants have not yet been identified—we were able to provide a precise reconstruction and to point to the implication and failures of several actors, including NATO and the coalition of national militaries, the Italian and Maltese Coast Guards, the fishing and commercial vessels present in the area and Gaddafi's troops. Because of this multiplicity of actors and the partial and overlapping juridical regimes with which the migrants' boat intersected, the question of who


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should be held responsible for the systemic violence perpetrated onto the passengers emerged. While the fragmentation of juridical regimes at sea so often allows for the evasion of responsibility, in this case it was mobilized strategically towards the *multiplication* of potentially liable actors and of forums where they could be judged and debated. Not only were several legal complaints lodged in the courts of France, Italy, Spain, and Belgium against unknown parties for nonassistance to people in danger at sea—each time generating press attention—but several other initiatives took place in parallel: two documentary investigations were screened on television as well as at festivals;[65] a report was published by the Council of Europe, leading to several hearings with representatives from different states; and finally, the case was presented in many venues to activist and academic audiences across Europe and North Africa. Each of the forums, with their respective languages, rules and technologies, became a space of judgment. But even managing to address the responsibility of the numerous actors involved would have been insufficient if the multifarious policies of exclusion, militarization, and evasion of responsibility that shaped the incident in the first place were not themselves put on trial. While demanding accountability for *all* the deaths of migrants at the maritime frontier of the EU has not been possible so far within the forum of the law and its particular language, the different actors investigating this case had to go beyond the realm of the law and venture into that of politics. In this way, they denounced the violence of the denial of freedom of movement and the deaths it generates, which no amount of compliance with legal obligations will be able to undo.

Conclusion: Liquid Lands

Following the meandering route of the history of the governance of the seas and its intersection with the policing of the mobility of people was necessary to understand the conditions under which the sea was made to kill, and which have led to the structural violations of the rights of migrants. Only through a "hand-to-hand" struggle with this network of geographic, aesthetic, technological, legal, social, and political conditions were we able to reinscribe history and responsibility into a sea of impunity.

Understood in these terms, incidents such as the "left-to-die boat" shed a new and crude light on contemporary forms of maritime governance and migration management. The image of the Mediterranean that emerges is that of an environment crisscrossed by "a thick fabric of complex relations, associations, and chains of actions between people, environments, and artifices."[67] It is the totality of this field of forces that constitutes the particular form of governance that operates at sea. With regard to the policing of illegalized migrants, we have seen that the selective expansion and retraction of sovereignty that this space enables has led to a form of governmentality



Fig. 13. I-Map, 2012. Dialogue on Mediterranean Transit Migration (MTM) map of Irregular and Mixed Migration Flows. Source: International Centre for Migration Policy Development (ICMPD). The I-Map project developed by the ICMPD in collaboration with states and international organizations is an interactive cartography that traces out migration routes, initially on the borders of Europe, but increasingly expanding to the wider region of Africa, The Middle East, and Eurasia. I-Map was designed to develop a new sensibility among border and migration management agencies to the complexities of migrant routes across a wide geographic area.[66]

that, although highly militarized, diverts and modulates movement rather than blocking it, blurs the line between humanitarian and policing functions, and inflicts deaths on a large scale by creating conditions of precarious crossing and by refraining from acting to save those caught in this liquid trap. The fantasy of a soft governance that would make the movement of people and things simultaneously orderly and productive is a mere chimera, since there will always be subjects that refuse this order, and attempts to tame them can only lead to deaths and legal violations on a structural basis. The deaths at the maritime frontiers of the EU are, in this sense, the necropolitical ghost that haunts this vision of neoliberal governmentality.[68] They will continue unabated as long as the current migration regime and governance of the seas prevails. While European publics seem to have come to accept these deaths as a necessary lesser evil, documenting violations, filing multiple contentious legal cases, and supporting the mobilization of the relatives of the migrants lost at sea in their struggles to shed light on what has happened to their family members, may be seen as inserting "grains of sand" into the migration regime's mechanisms, blocking them temporarily, forcing them to change

slightly.[69] In this process, an important shift has occurred: states, the military, and other actors at sea no longer have the monopoly over watching. Civil society demands that the increased capacity to monitor the sea be accompanied by an increased level of responsibility, and uses the same sensing technologies against the grain to follow the (in)actions of the different actors who operate in the frontier space of the sea, reinscribing responsibility where they attempt to evade it. But if the change that may be affected through such a practice is only in its infancy, we already observe the tendency of maritime-like forms of governance being exported onto land, in a striking inversion of Carl Schmitt's land—sea binary. While, as we saw, the challenge for Schmitt was to impose onto the ocean a form of power characteristic of the land, the sea has become a laboratory in which new forms of contemporary governance have been devised and experimented with and are now being brought to bear on the land. As at sea, border functions on the land have been decoupled from the limits of the territorial border and are becoming increasingly dispersed and mobile, able to follow ever-shifting routes. From the notion of "Routes Management," which revolves around the charting of clandestine migrants' routes (see fig. 7), to that of "Integrated Border Management," which seeks to control migration "before, at and after the border," practices of border control seem to have increasingly done away with fixed territorial thinking.[70] In a move that echoes the practice of maritime governance over several centuries, their focus seems instead to be on following the routes of migrants as they move across different geographical and political spaces. Rather than the "solidification of the sea"—a term that was suggested by the collective Multiplicity to describe the progressive invasion of the terrestrial logics of bordering into the sea—what we observe here is rather a "liquefaction of the land."[71]

There would be another, more desirable way to draw inspiration from the sea, one that is still out of sight of the hegemonic public view and policy circles. Viewing the world "from the sea," from the perspective of the constant movement of the liquid element that defies the appropriation of the ocean, one might be able to perceive the unruly freedom of human mobility which, far from being an anomaly, has been a constant throughout history, and that persists in excess of the multifarious practices that try to tame it.

1 Roland Barthes, *Mythologies*, ed. and trans. Annette Lavers (New York: Hill and Wang, 1972), 112.

2 For more information, see http://fortresseurope.blogspot.com/p/la-fortezza.html and http://www.unitedagainstracism.org/pdfs/listofdeaths.pdf, last accessed December 2013.

3 The terminology used to describe "migrants"—understood as people who cross political boundaries to live in another country for a more or less durable time and who, at some point in their trajectory or stay, evade the control and authorisation of the state—is highly politicised and contested. Within European media and policy uses, the terms "illegal migration" and "clandestine migration" are frequently used to point to the evasion or violation of the law, and both terms have negative connotations. In our research we alternate between using the terms "illegalized migrants" (to point to the policies that make migration illegal in the first place) and "clandestine migrants." This latter term may seem problematic in that it is marked to such an extent by the language of power; yet in its etymological connotations of hiddenness and secrecy, "clandestine" accurately describes the strategies of migrants who, having been denied access to legal means of entry into a state, must cross borders undetected. We will thus use the term "illegalized" when wishing to underline the effect of migration policies and "clandestine" when pointing to the strategies of migrants and when wishing to emphasize the "aesthetic" dimension of borders, as will be discussed further on. For the politics of the language of migration, see Franck Düvell, "Clandestine migration in Europe," *Social Science Information*, vol. 47, no. 4 (2008): 479–97, and Harald Bauder, "Why We Should Use the Term Illegalized Immigrant," *RCIS Research Brief,* no. 2013/1 (August 2013): 1–7, http://www.ryerson.ca/content/dam/rcis/documents/RCIS_RB_Bauder_No_2013_1.pdf.

4 See "Case: 'Left-to-Die Boat'" in this volume.

5 Duncan Depledge, "Geopolitical material: Assemblages of geopower and the constitution of the geopolitical stage," *Political Geography* (June 2013): 1–2; see also Kathryn Yusoff, Elizabeth Grosz, Nigel Clark, Arun Saldanha, and Catherine Nash, "Geopower: a panel on Elizabeth Grosz's *Chaos, Territory, Art: Deleuze and the Framing of the Earth," Environment and Planning D: Society and Space*, vol. 30 (2012): 971–88, at 973–75.

6 Carl Schmitt, *The Nomos of the Earth in the International Law of the Jus Publicum Europaeum* (New York: Telos Press, 2003). For a broader commentary on this text see Philip E. Steinberg, "Free sea," in *Spatiality, Sovereignty and Carl Schmitt: Geographies of the Nomos*, ed. Stephen Legg (London: Routledge, 2011), 268–75.

7 Schmitt, *The Nomos of the Earth,* 42–43.

8 For an important historical review of the shifting practices of cartography of oceans in relation to changing forms of governance and ideologies, see Philip E. Steinberg, "Sovereignty, Territory, and the Mapping of Mobility: A View from the Outside," *Annals of the Association of American Geographers,* 99(3) (2009): 467–95; see also Philip E. Steinberg, *The Social Construction of the Ocean* (Cambridge: Cambridge University Press, 2001), 99–109.

9 See Stefan Helmreich, "Nature/Culture/Seawater," *American Anthropologist.*, vol. 113, no. 1 (2011): 132–44; and Allan Sekula and Noël Burch, dirs., *The Forgotten Space* (Amsterdam: Doc.Eye, 2010), 112 min.

10 Lauren Benton traces back this process to the early modern period in *A Search for Sovereignty: Law and Geography in European Empires, 1400–1900* (Cambridge: Cambridge University Press, 2010), 105.

11 Philip Steinberg traces this period back to the 1493 Papal bull. The bull was formalized and amended the following year by the Treaty of Tordesillas. Philip E. Steinberg, "Lines of Division, Lines of Connection: Stewardship in the World Ocean," *Geographical Review*, vol. 89, no. 2, Oceans Connect (April 1999): 254–64.

12 English translations of these Latin texts have been published as Hugo Grotius, *The Freedom of the Seas, or the Right Which Belongs to the Dutch to Take Part in the East Indian Trade,* trans. Ralph Van Deman Magoffin (New York: Oxford University Press, 1916) and John Selden, *Of the Dominion, or Ownership of the Sea: Two Books* (New York: Arno, 1972).

13 Steinberg, *The Social Construction of the Ocean,* 97 and 105. It should also be remembered that both thinkers were writing from the perspective and in the service of mercantilist states which were challenging Iberian maritime supremacy. See China Miéville, *Between Equal Rights: A Marxist Theory of International Law* (London: Haymarket Books, 2006), 211.

14 Benton, *A Search for Sovereignty*, 106.

15 Steinberg, "Free sea," 271.

16 Before the emergence of relatively independent scientific institutions, oceanographic knowledge was produced by sailors involved in military and commercial activities. Even at the turn of the nineteenth century, scientists frequently operated within naval institutions and relied on their infrastructure; the fact that the ships associated with the pioneers of oceanography were exclusively military is a striking expression of this. For a general overview of the emergence of oceanography, see Tom Garrison, *Essentials of Oceanography,* 5th ed. (Belmont, CA: Brooks/Cole Cengage Learning, 2009), 22–44. For more specific and theorized examples, see Michael S. Reidy, "The Royal Navy and the Rise of Modern Geophysics," *Trafalgar Chronicle* no. 18 (2008), 222–37; and Graham Burnett, "Hydrographic Discipline Among the Navigators," in *The Imperial Map: Cartography and the Mastery of Empire,* ed. James Ackerman (Chicago: University of Chicago Press, 2009), 185–255.

17 For the use of the concept of the sensorium in relation to assemblages of technologies extending the human senses, see Mark Cote, "Technics and the Human Sensorium: Rethinking Media Theory through the Body," *Theory & Event*, vol. 13, no. 4 (2010); and Bruno Latour, "Air," in *Sensorium*, ed. Caroline A. Jones (Cambridge, MA: MIT Press, 2006), 104–07.

18 For a useful summary, see Juan Luis Suárez de Vivero, *Jurisdictional Waters in The Mediterranean and Black Seas* (Brussels: European Parliament, 2010).

19 Paolo Cuttitta, "Le monde-frontière. Le contrôle de l'immigration dans l'espace globalisé," *Cultures & Conflits*, 68 (2007): 61–84.

20 1979 International Convention on Maritime Search and Rescue (SAR).

21 Steinberg, "Free sea," 270. For the unbundling of sovereignty considered within a historical perspective and in other fields, see Saskia Sassen, *Territory, Authority, Rights: From Medieval to Global Assemblages* (Princeton, NJ: Princeton University Press, 2006).

22 Gemma Andreone, "Observations Sur La 'Juridictionnalisation' de La Mediterranée," *Annuaire Du Droit de La Mer*, vol. 9 (2004): 7–25.

23 For an overview of these disputes, see Suárez de Vivero, *Jurisdictional Waters in the Mediterranean.*

24 Andreas Fischer-Lescano and Gunther Teubner, "Regime-Collisions: The Vain Search for Legal Unity in the Fragmentation of Global Law," *Michigan Journal of International Law*, vol. 25:999 (2004): 999–1046, at 1004. We are grateful to Sandro Mezzadra for this reference.

25 Michel Foucault, *Security, Territory, Population: Lectures at the Collège de France,* 1977–78 (New York: Palgrave Macmillan, 2007), 34.

26 Ameer Abdulla and Olof Linden, eds., *Maritime traffic effects on biodiversity in the Mediterranean Sea,* IUCN Centre for Mediterranean Cooperation (Malaga, Spain: 2008): 1–184, at 8. This report further notes that approximately 30% of international sea-borne volume originates from or is directed towards the 300 ports in the Mediterranean Sea.

27 Efthymios Papastavridis, "The Right of Visit on the High Seas in a Theoretical Perspective: *Mare Liberum versus Mare Clausum Revisited," Leiden Journal of International Law*, vol. 24, issue 1 (March 2011): 45–69. For the UN's specification of those practices that should be covered by the term "interception," see U.N. Office of the High Commissioner for Refugees (Exec. Comm.), *Conclusion on Protection Safeguards in Interception Measures*, no. 97, 10 October, 2003, http://www.unhcr.org/3f93b2894.html. For the use of the "right to visit" as the basis for interception, see Eur. Parl. Ass., *The interception and rescue at sea of asylum seekers, refugees and irregular migrants*, 22nd Sitting., Doc. No. 12628 (2011), http://assembly.coe.int/ASP/XRef/X2H-DW-XSL.asp?fileid=18008&lang=en, last accessed September 2013.

28 AIS (Automatic Identification System) is a ship-borne transponder system designed for maritime safety and in particular collision avoidance. It provides information as to identification, position, speed, course. This live data is made publicly accessible on different websites such as marinetraffic.com. While mandatory for large commercial ships, the carriage of AIS is not required for certain categories of ships such as warships. VMS (Vessel Monitoring System) data is mandatory for fishing vessels longer than 15 m and is used to monitor fishing activities. While VMS operates in very much the same way as AIS data, it remains tightly controlled by state agencies. See "Integrated Maritime Policy for the EU, Working Document III, On Maritime Surveillance Systems," *European Commission / Joint Research Centre*, Ispra, Italy, June 14, 2008, http://ec.europa.eu/maritimeaffairs/policy/integrated_maritime_surveillance/documents/maritime-surveillance_en.pdf.

29 Fernand Braudel, *The Mediterranean and the Mediterranean World in the Age of Philip II*, 2nd ed., 2 vols., trans. Sian Reynolds (New York: Harper and Row, 1976), 168.

30 Karin Knorr Cetina, "The Synthetic Situation: Interactionism for a Global World," in *Symbolic Interaction*, vol. 32, no. 1 (2009): 61–87, at 64.

31 Such techniques are already being implemented by NATO, for example: see Commander Brian Finman, "Keeping the Med safe–how it's done", *NATO Review*, May 19, 2010, http://www.nato.int/docu/review/2010/Maritime_Secu rity/EN/index.htm. EU agencies are still developing this practice, with the "Blue Hub" project of the EU's Joint Research Council (JRC) leading the way. See http://ipsc.jrc.ec.europa.eu/index.php/Projects/318/0/ and https://bluehub.jrc.ec.europa.eu/, last accessed September 2013.

32 Eur. Comm'n Joint Research Council, *JRC-Frontex Space-borne SAR Small Boat Detection Campaign–Italy & Spain* (2011) (by Victor M.G. Silva and Harm Greidanus), http://publications.jrc.ec.europa.eu/repository/bitstream/111111111/24183/1/lbna25065enn.pdf, last accessed September 2013.

33 William Walters, "Where Are the Missing Vehicles? Critical Reflections on Viapolitics" (paper presented at the Summer School on "Border Crossing Selves") Hanyang University, Seoul, June 25–29, 2011).

34 Ibid.

35 For an overview of the historical emergence of the European Union's migration regime and the apparatus that is used to implement it, see Migreurop, *Atlas of Migration in Europe: a Critical Geography of Migration Policies* (London: New Internationalist Publications, 2013).

36 There are several more specific reasons for this, including the need for un- or de-qualified migrant labor in EU economies, the constraints imposed on liberal democracies by the human rights regime, and because once established, migratory networks tend to become self-sustaining and relatively autonomous from policies. See Paul De Guchteneire and Antoine Pécoud, "International Migration, Border Controls and Human Rights: Assessing the Relevance of a Right to Mobility," *Journal of Borderlands Studies*, vol. 21, no. 1 (2006): 69–86.

37 On this, see also Lorenzo Pezzani, "The Two Lives of the Cap Anamur: Humanitarianism at Sea" in this volume.

38 Mehdi Alioua and Charles Heller, "Transnational Migration, Clandestinity and Globalization–Sub Saharan Transmigrants in Morocco," in *New Mobilities Regimes in Art and Social Sciences*, eds. S. Kesselring and G. Vogl (London: Ashgate Publishing, 2013): 175–84.

39 Our understanding of aesthetics is influenced by the work of Jaques Rancière, for whom politics hinges first and foremost on "the partition of the sensible," which he defines as the distribution and redistribution of times and spaces, places and identities, that way of framing and reframing the visible and the invisible, of telling speech from noise. See Jacques Rancière, *The Politics of Aesthetics*, trans. Gabriel Rockhill (London: Continuum, 2006).

40 Here too social networks proved central: like many hundreds of people before and after them, the passengers in distress used a satellite phone to contact Father Mussie Zerai, an Eritrean priest living in Rome who has defended migrants crossing through Libya for several years, and whose phone number has circulated by word of mouth.

41 CIVIPOL, *Feasibility study on the control of the European Union's maritime borders,* at 8 and 71, transmitted July 4, 2003 to the European Commission (JHA), document 11490/1/03 (2003), http://www.ifmer.org/assets/documents/files/documents_ifm/st11490-re01en03.pdf.

42 Ibid., 8.

43 This effect is explicitly recognized in the report, which notes that while the majority of clandestine migration by sea uses "focal routes" of which "geography dictates the locations–straits or narrow passages where Schengen countries lie close to countries of transit or migration," they observe that "when a standard destination is shut off by surveillance and interception measures, attempts to enter tend to shift to another, generally more difficult, destination on a broader and therefore riskier stretch of water" (Ibid., 9). The effect has also been widely observed in academic literature–see for example Hein De Haas, "The myth of invasion: The inconvenient realities of migration from Africa to the European Union," *Third World Quarterly*, vol. 29, no. 17 (2008): 1305–22.

44 Nicholas De Genova, "Spectacles of migrant 'illegality': The scene of exclusion, the obscene of inclusion," in *Ethnic and Racial Studies*, vol. 36, no. 7 (2013): 1180–98. See also Claire Rodier, *Xénophobie business* : À quoi servent les contrôles migratoires ?, (Paris: La découverte, 2012).

45 This was the case, for instance, of Spain. Ruben Andersson, "A Game of Risk: Boat migration and the business of bordering Europe," *Anthropology Today*, vol. 28, no. 6 (December 2012): 7–11, at 8. This was also the argument mobilized by the Italian government in the trial against Hirsi et al. at the ECHR, as discussed in Matteo Tondini, "Fishers of Men? The Interception of Migrants in the Mediterranean Sea And Their Return to Libya," paper published as part of the INEX Research Project, October 2010, http://www.inexproject.eu/.

46 The Guidelines on the Treatment of Persons Rescued at Sea (adopted in May 2004 by the Maritime Safety Committee together with the SAR and SOLAS amendments) contain the following provisions:
"The government responsible for the SAR region in which survivors were recovered is responsible for providing a place of safety or ensuring that such a place of safety is provided." MSC Res. 167(78), ¶ 2.5, Doc. MSC 78/26/Add.2 (May 20, 2004).

47 See Thomas Gammeltoft-Hansen and Tanja E.Aalberts, "Sovereignty at Sea: The law and politics of saving lives in the Mare Liberum," *DIIS Working Paper* (2010): 1–31, at 18; and Juan Luis Suárez de Vivero, *Jurisdictional Waters in The Mediterranean and Black Seas*.

48 This dispute is well summarized by Thomas Gammeltoft-Hansen and Tanja E. Aalberts, "Sovereignty at Sea," 21: "Italy has signed the 2004 amendments to the SAR and SOLAS conventions that stipulate that the migrants should be disembarked on the territory of the state within which's [*sic*] SAR zone its vessel is identified or intercepted. Malta however, due to the size of its SAR zone, has refused to ratify these amendments for fears that it would impose unrealistic obligations to disembark migrants rescued by other states and private vessels. Malta consequently maintains the interpretation that the coordinating country's obligation is to disembark rescued persons at the nearest safe port of call. This has led to tensions between Malta and Italy following a series of incidents where migrants were rescued in Malta's SAR zone yet closer to the Italian islands Lampedusa and Pantelleria. The result has been lengthy stand-off during which migrants have died, and a number of confrontations between Italian and Maltese naval vessels literally trying to block each other from entering its territorial waters and disembark rescued migrants."

49 Efthymios Papastavridis, "Rescuing 'Boat People' in the Mediterranean Sea: The Responsibility of States under the Law of the Sea," blog of the *European Journal of International Law*, May 31, 2011, http://www.ejiltalk.org/rescuing-boat-people-in-the-mediterranean-sea-the-responsibility-of-states-under-the-law-of-the-sea/.

50 See fig. 2 showing the chain of events in "Case: 'Left-to-Die Boat'" in this volume.

51 In his March 17, 1976 lecture, Foucault addressed the form of power over life–biopower–which emerged in the nineteenth century. Foucault argues that in the classical theory of sovereignty, the right of life and death was one of sovereignty's basic attributes, but was mainly exercised negatively, in the taking of subjects' lives. The new power over life that emerges in the nineteenth century is much more productive in that it revolves around the care for life and death, and is inflicted less through direct action than through the lack of care. In the process, the right over life and death was radically transformed: "sovereignty's old right—to take live or let live—wasn't replaced, but it came to be complemented by a new right which does not erase the old right but which does penetrate it. […] It is the power to 'make' live and 'let' die." Michel Foucault, "*Society Must Be Defended": Lectures at the Collège de France,* 1975-1976, trans. David Macey (New York: Picador, 2003), 240–41.

52 The recent work of Jean-Pierre Cassarino is an important reminder that these policies were not only imposed by the EU on Tunisia within highly unequal relations, but that the Ben Ali regime instrumentalized externalization policies to forward its own goals of political and social control. Jean-Pierre Cassarino, "Tunisia's New Drivers in Migration Governance" (presented at the International Studies Association Conference, San Francisco, CA, April 3–6, 2013).

53 It should be noted that, contrary to the alarmist discourse of EU politicians, those fleeing Libya mostly remained within North Africa, with over 700,000 people fleeing to neighboring countries and only 25,935 people arriving in Italy and 1,530 in Malta. See Office of the UN High Comm'r for Refugees, *Update no 13: Humanitarian Situation in Libya and the Neighbouring Countries,* March 24, 2011, http://www.unhcr.org/.

54 Office of the UN High Comm'r for Refugees, *Mediterranean takes record as most deadly stretch of water for refugees and migrants in 2011*, briefing notes, January 31, 2012, http://www.unhcr.org/4f27e01f9.html.

55 Vice Admiral Rinaldo Veri, Commander of the NATO Maritime Command in Naples responsible for the embargo

enforcement, stated on April 4, 2011 that "anyone who believes they can sail through NATO's layers of surveillance and interdiction needs to think again." NATO, "VADM Veri holds Press Conference aboard ITS Etna," April 4, 2011, http://www.jfcnaples.nato.int/page167503642.aspx.

56 For the initial press release by the French NGO GISTI (Groupe d'information et de soutien des immigrés), which made the explicit connection between surveillance and responsibility, see GISTI, "Le Gisti va déposer plainte contre l'OTAN, l'Union européenne et les pays de la coalition en opération en Libye," June 9, 2011, http://www.gisti.org/spip.php?article2304.

57 The report can be found at http://www.forensic-architecture.org/publications/report-on-the-left-to-die-boat/. See also the "Case: 'Left-to-Die Boat'" investigation text in this volume.

58 See Lorenzo Pezzani, "The Two Lives of the *Cap Anamur*: Humanitarianism at Sea," in the present volume.

59 See Nicholas De Genova, "Spectacles of migrant 'illegality'."

60 We further elaborate this strategy of the "disobedient gaze" in Charles Heller and Lorenzo Pezzani, "A disobedient gaze: strategic interventions in the knowledge(s) of maritime borders," *Postcolonial Studies*, vol. 16, issue 3, special issue on "Migrations and Militant Research," eds. Martina Tazzioli and Glenda Garelli (2013): 289–98.

61 See the "Case: 'Left-to-Die Boat'" investigation summary in the present volume.

62 For an exploration of this web of relations, see Laura Kurgan, *Close Up at a Distance: Mapping, Technology and Politics* (Zone Books, New York, 2013).

63 For further details, see the "Case: 'Left-to-Die Boat'" investigation summary in the present volume.

64 Bruno Latour, "Anthropocene and the Globe Theatre," lecture 4 of the 2013 Gifford Lectures, University of Edinburgh, February 18–28, 2013.

65 Emiliano Bos and Paul Nicol, dirs., *Mare Deserto* (Switzerland, RSI, January 24, 2012.), 52 min., http://la1.rsi.ch/falo/welcome.cfm?idg=0&ids=0&idc=42593; and Stefano Liberti and Andrea Segre, dirs., *Mare Chiuso* (Italy, Zalab, 2012), 60 min.

66 Maribel Casas-Cortes, Sebastian Cobarrubias and John Pickles, "Re-bordering the neighbourhood: Europe's emerging geographies of non-accession integration," *European Urban and Regional Studies*, vol. 20, no. 1 (2013): 37–58.

67 Eyal Weizman, *Forensic Architecture: Notes from Fields and Forums* (Ostfildern: Hatje Cantz, 2012), 6.

68 Sandro Mezzadra and Brett Neilson, *Border as Method, or, the Multiplication of Labor* (Durham: Duke University Press, 2013), 174.

69 Following the "left-to-die boat" case, we have continued to collaborate with the migrants' rights movement through different investigations and by developing a new online and participatory mapping platform, "WatchTheMed," www.watchthemed.net.

70 Casas-Cortes, Cobarrubias, and Pickles, "Re-bordering the neighbourhood."

71 Multiplicity/Stefano Boeri and John Palmesino, "Materials for a research programme on contemporary flows through the Mediterranean," *Archis* (September 2002).

The Two Lives of the *Cap Anamur*: Humanitarianism at Sea

Lorenzo Pezzani

Since the end of the 1970s the sea has emerged as a fundamental terrain for humanitarian intervention. It was in the second half of that decade, in the South China Sea, that a new category of migrants defined by the vehicle on which they travelled came to the fore—the so-called "boat people." At the same time, ships became spaces of humanitarian intervention in their own right, modifying not only the way in which humanitarian operations have been carried out but also the way in which migration at sea has become a matter of public concern.

One particular ship, together with one of its later namesakes, stands out as a symbol of this new phase: the *Cap Anamur*. Each of these two vessels, as well as the organization that was named after them, became the protagonists in two episodes that have profoundly marked the history of humanitarianism and its conjunction with the practice of bearing witness to underreported catastrophes around the world. The first ship to be named *Cap Anamur* began its operations in the midst of the Vietnamese exodus of 1979 when, so the organization claimed, it helped to rescue "9,057 people from death" and, together with other similar humanitarian vessels, became a fundamental forum for the collection and transmission of images of the boat people's plight.[1] In 2004, this time in the Mediterranean, a second ship belonging to the same organization, once again named *Cap Anamur*, rescued thirty-seven sub-Saharan migrants on their way to the southern shores of Europe and found itself in the midst of another affair in which not only the possibility of conducting rescue operations at sea but also that of raising awareness of the thousands of migrants who have been dying in recent years in the Mediterranean came under threat.

In this sense, both these events have been crucial to the transformation of the "media aesthetics" of humanitarianism, i.e. all the visual and aural protocols involved in the becoming-public of events of distant suffering. Retracing the historical trajectory of these two *Cap Anamurs*, as I will do in this short essay, allows us to understand the shifts that have occurred in the twenty-five years separating the first intervention in the South China Sea from the events of the Mediterranean. It allows us, more specifically, to explore how the idea of bringing images of distant suffering to a large public has been transformed under conditions of increased border surveillance

and militarization; to suggest new opportunities that have emerged in an era of proliferating possibilities for image production; and to ask under what conditions these opportunities might be taken up.

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The episode concerning the first *Cap Anamur* took place in the aftermath of the Vietnam War. After North Vietnamese troops entered Saigon in 1975, thereby unifying the country under communist rule, there began an exodus of refugees which within a few years reached disastrous proportions.[2] In late 1978, when larger ships started being used to transport people fleeing Vietnam, the number of recorded arrivals in neighboring countries increased rapidly,[3] and "the trickle of refugees became a flood."[4] Aboard unseaworthy vessels, many of those leaving Vietnam drowned or were attacked by pirates who, attracted by the rumors of people carrying large amounts of gold, abducted, robbed, and killed hundreds of them. Other ships navigating in the area largely ignored the refugees, and those who finally reached the coasts of neighboring states, dehydrated and sick, were often refused disembarkation and pushed back into the sea, where their tragedy continued. Shocked by the images of the refugees' plight coming from the South China Sea, several private citizens around the world decided to act. As many accounts of these events foreground,[5] it was the link established through television between the open sea and the rest of the world that spurred the international response, thereby inaugurating a new relationship between humanitarianism and media that came to be regarded as one of the defining features of this new form of intervention without borders.



Figs. 1–5. Stills from an interview with Bernard Kouchner, aboard the ship *Akuna* in the China Sea, pointing, as the original caption of the video states, to "a boat of fishermen-pirates." December 7, 1981. Kouchner, one of the most prominent and controversial figures in the new wave of humanitarian actors that emerged in the late 1960s (and later the French Minister of Foreign Affairs and one of the champions of "state-led" military humanitarian intervention), was one of the main proponent of the "Un Bateau pour le Vietnam" (A boat for Vietnam) committee, which spearheaded the use of humanitarian vessels and led to the creation of the Cap Anamur initiative.

Rupert Neudeck, himself a journalist, decided to follow the initiative of the humanitarian Bernard Kouchner and the French committee "Un Bateau pour le Vietnam" (A boat for Vietnam) and, with the support of leading West German intellectuals such as Heinrich Böll, chartered the *Cap Anamur*, which started to operate in the summer of 1979.[6] Vessels of different kinds had been used earlier in the Indochinese refugee crisis to bring aid and relief supplies. This time, however, ships such as the *Cap Anamur*, the *Île de Lumière*, the *Akuna*, and the *Lyskell* were transformed into veritable hospital ships, seagoing ambulances of sorts, which searched the same waters where pirates were operating for boat people in distress. Most importantly, these ships often carried teams of reporters and journalists who, by connecting the public with what was happening on the sea, transformed their decks into forums of a new kind.[7] Through them, the public image of this crisis was broadcast to a growing public and the boat people emerged as a subject of history and an object of government.

It is not surprising that it was on the ocean, the international space par excellence, that the new humanitarianism without borders which emerged in those years after the creation of Médecins Sans Frontières ("the humanitarian international, as Alex De Waal once called it") found one of its favorite terrains.[8] The high seas, being outside the full jurisdiction of a sovereign state, provided these new humanitarian actors with an effective form of extraterritoriality in which independent intervention was possible. Nevertheless, in the same way as international waters are not located outside any form of control,[9] these news forms of maritime humanitarianism also did not exist in a power vacuum and thus immediately entered into difficult and ambiguous relations with state power. While (and because) these ships sailed under European flags as a guarantee that those rescued at sea would be allowed to disembark and be resettled in the West, their intention to operate as mobile rescue platforms met with strong resistance from Western national authorities. It was only after several weeks of functioning as a stationary hospital off the Indonesian Anambas Islands that the *Cap Anamur* was allowed to conduct operations at sea, and not before being reminded by the German Foreign Office "not to rescue too many [boat people]."[10] The dilemmas and contradictions that made it possible for humanitarian operations and human rights principles to be largely recaptured by the arsenal of state and military governmental techniques in the so-called "humanitarian present"[11] were already present, in embryonic form, in the South China Sea of the 1970s.

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This was the context in which, in 1981, Michel Foucault, who had already been a supporter of "Un Bateau pour le Vietnam," was invited to Geneva to speak at a press conference organized by the newly founded International Committee against Piracy (ICP). The event was intended to raise awareness of the pirate attacks on the Vietnamese boat people, and took place near the UNHCR headquarters, whose corridors at the time "were decked with giant photographs of the boat people staggering ashore from their crippled vessels."[12]

In a short but powerful statement titled "Confronting Governments: Human Rights," written with the passionate tone of a manifesto, Foucault outlines the traits of an emerging "international citizenship," of which the Committee against Piracy would constitute an example, and for which initiatives such as the Cap Anamur, which he explicitly mentions, constitute conspicuous antecedents.[13] This new citizenry, he argues, has not been appointed by anyone and is composed of "private individuals […], with no other ground for speaking, or for speaking together, than a certain

shared difficulty in enduring what is taking place."[14] What binds together this unauthorized gathering of individuals is not their belonging to traditional ideologies or political constituencies, but rather the fact that they are "all members of the community of the governed."[15] Their duty and right, the philosopher continues, is "to always bring the testimony of people's suffering to the eyes and ears of governments. […] The suffering of men must never be a silent residue of politics. It grounds an absolute right to stand up and speak to those who hold power."[16] Significantly, Foucault binds the introduction of this new, nonsovereign right to an aesthetic preoccupation, that of "bringing to the eyes and ears" of government the misfortune of people.[17] He foregrounds an act of witnessing where what is at stake is the limit between the visibility and the invisibility of a claim, its becoming audible and intelligible. According to this understanding, humanitarian action (and nongovernmental politics at large) would not only consist of bringing aid and relief to a suffering population, but also raising international awareness about their plight in order to turn the latter into a matter of concern for a larger public.

While this paradigm of "bringing testimony" has become the watchword and predominant practice of the international human rights movement,[18] a series of problems have started to emerge. Foucault himself was certainly wary of some of these risks and, in his speech, he explicitly cautions against an understanding of activism that would rely on "the theatrical role of pure and simple indignation that is proposed to us."[19] However, in the mainstream discourse on humanitarianism, the idea of "bringing testimony" has been largely taken for granted and left unquestioned, thus engendering a whole web of presuppositions and (largely false) expectations about the role that the visibility given to a certain event or group of people might play and the reactions it might trigger.[20] The risks and possibilities implicit in this paradigm were highlighted, a few years later, by a second episode which involved the *Cap Anamur*'s namesake successor.

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Fast forward to 2004. The Cap Anamur organization that began in the 1970s is now a fairly large and respected NGO which operates across the world to bring emergency medical care and humanitarian aid. Although they have continued chartering ships to deliver relief items all over the world, since 1986 their operations have moved decidedly inland. In 2003, however, a new director, the former journalist Elias Bierdel, replaced Rupert Neudeck as the president of the organization and proposed to buy a ship to carry out its humanitarian operations.[21] Faithful to the principle of independence that has been one of the grounding ideals of contemporary humanitarianism, he decided to take advantage of the celebrations for the association's twenty-fifth anniversary and the large influx of donations that the memories of the Vietnam action provoked to buy a new ship, which was immediately christened *Cap Anamur*. His long-term project, besides using the ship to bring aid supplies to the areas where his NGO was operating, was to raise awareness of the dramatic effects of climate change on the small Pacific Island of Tuvalu, which is threatened with being swamped by raising sea levels and frequent storm surges. Bierdel's idea was to navigate to Tuvalu side by side with another iconic nongovernmental ship, Greenpeace's *Rainbow Warrior*, in a demonstrative action that could have made the potentially disastrous effects of climate change visible to the whole world. But during its inaugural test trip, the story took an unexpected turn.

While it was solving some engine problems in the Central Mediterranean between Malta, Libya, and the small Italian island of Lampedusa, the *Cap Anamur* rescued thirty-seven African migrants in distress during their crossing to Europe. After having decided to disembark them in Sicily, the ship headed towards the port of Pozzallo but was denied permission to enter Italian territorial waters. The ship was held off the coast of Sicily during a legal and diplomatic standoff in which the fate of the asylum seekers bounced between competing claims and denials by the governments of Italy, Germany, Malta, as well as the EU and the UNHCR. Over the course of two weeks, numerous lawyers, journalists, photographers, politicians, priests, activists, and doctors reached the ship. Itinerant disaster area and floating court at the same time, the ship became yet another temporary and precarious zone of contested political agency. Through press conferences, articles, and TV news, the situation on board was broadcast to a growing public, with denouncements of the apparent widespread indifference towards the growing numbers of migrants dying at sea. The exposure of the migrants' plight, though, did not ultimately lead to their salvation. When the ship finally entered a Sicilian port, the migrants were immediately expelled after being identified as "bogus" asylum seekers, and representatives of the *Cap Anamur*, including Bierdel himself, were indicted (and not acquitted until a few years later) for supporting illegal immigration and turning the humanitarian emergency into a "PR stunt" for their own profit.[22]

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Compared to the situation in Indochina of the late 1970s, the conditions in which the *Cap Anamur* found itself in 2004 were radically different. Certainly, the attitude of Western governments towards boat people and migrants in general has changed following the end of the Cold War, seeing them increasingly treated as "undesirables."[23] But the maritime border itself has also been considerably transformed. Under the impulse of the securitarian discourse, the Mediterranean has been turned into a militarized border constantly scanned by remote sensing devices geared towards its enforcement.[24] The dominant image of migrants that is produced through this vast surveillance apparatus and made public by border controlling agencies and mainstream media is either that of "illegal" trespassers who "invade" Europe, or that of the victims of trafficking at the mercy of

unscrupulous smugglers. In both cases, by rendering "migrant 'illegality' […] spectacularly visible" and thus naturalized, such representations have become a function of the border itself, their primary role being only to confirm the necessity of the latter.[25]

So if, in 1978, despite the contradictions that were already present, the question for humanitarian actors might have been posed in terms of how to make the claims of refugees heard and their plight visible, today the issue seems far more complex. The fact is that, insofar as "only detected, that is to say failed acts of illegal immigration become visible,"[26] images of migration have often already unwittingly become an integral part of the border regime itself. Under such conditions, the risk implicit in "bringing testimony" is to ignore the ways that openness and transparency can support governmental practices and regimes of power, in particular within the field of the politics of migration. Since for migrants the only possibility for moving is often to do so undetected, "showing what is hidden may sometimes lead to new forms of oppression."[27] This is what the case of the *Cap Anamur* painfully reminds us. Despite the courageous effort to make visible the violence routinely perpetrated against migrants at the maritime borders of Europe, this act of exposure was infamously turned against the migrants and the crew of the ship themselves. For the migrants, it implicitly became proof of their illegal status, which led to their hasty deportation; for the crew of the ship, while it was insufficient to prevent them from being brought to court, accused of "illegal trafficking" of migrants, it was enough to morally disqualify their intervention as an alleged attempt to attract funding through a "high-visibility" crisis.







Figs. 6–8. Stills from footage collected on board the *Cap Anamur* during the diplomatic standoff off the coast of Italy in the summer of 2004. Courtesy of Aquino Film Gmbh.

This ability of the border regime to diffuse or even turn against itself the emancipatory potential of attempts to expose the violence it produces reflects a larger process by which humanitarian discourse in general has increasingly been mobilized, not against the coercive dimension of borders and in defense of migrants' freedom of movement, but rather to reaffirm the inviolability of borders. The way governmental agencies, in the aftermath of the wreck that caused the death of 366 people off the coast of Lampedusa on October 3, 2013, have used the dangers of illegalized sea voyages to advocate for an increase in the militarization and externalization of border controls is just the latest in a long list of such examples. In this sense, humanitarianism has not been simply impeded by borders, as has been suggested.[28] Rather, it has become an integral part of them and of their governing function.[29]

While this might seem to suggest that the paradigm of "bringing testimony" has lost its ability to underpin the non-sovereign right advocated by Foucault, the current situation of (maritime) borders has also opened up new and unexpected opportunities. While the Mediterranean, for instance, is increasingly a space of control, it is also true that the means of its surveillance are no longer exclusively in the hands of states and that even images produced by them can be obtained and repurposed as active sites of struggle by a much larger number of people. Much of the data normally used to monitor clandestine trips—satellite images, plane- and ship- spotters' websites, vessel tracking data, online ships' logs, oceanographic, and meteorological data—can be accessed and used for purposes other than those for which they were originally commissioned. Moreover, the proliferation of small audio- and video-recording devices means that many more people at sea, including migrants themselves, can now mass-produce images and sounds which are already in their production (and not only in their consumption) outside of the control of border agencies, be they state, international, or nongovernmental organizations.

What would it take to seize the new opportunities offered by this expanded field of visual and aural imaging? What would it mean to participate in the circulation of these images while acknowledging that they exist within the same border regime, the very field of power they might seek to oppose and, as such, that it is not simply by unveiling its violence that their emancipatory potential is unleashed? That the political relevance of migration does not reside in the creation and public exposure of a new subject—the migrant—either as a victim or as a sort of (almost revolutionary) avant-garde, but rather that the subjectivities that are produced in the process of moving are already destabilizing established geographies of power for the very fact of being "there where you are not supposed to be"? Rethinking a visual culture that would be able to operate within and against the ambivalences of this border regime and not betray the empowering potential of that new form of right advocated by Foucault is one of the crucial political tasks that lies ahead of us.

1 Rupert Neudeck, *Exodus aus Vietnam* (Bergisch Gladbach: Lübbe, 1986), 230.

2 The reconstruction of the boat people crisis in Vietnam is based on the following texts: Bruce Grant, *The Boat People: An Age Investigation* (Harmondsworth: Penguin Books, 1979); Barry Wain, *The Refused: The Agony of the Indochina Refugees* (New York: Simon & Schuster, 1981); Bernard Kouchner, *L'île de lumière* (Paris: Ramsay, 1980); Rupert Neudeck, *Die letzte Fahrt der Cap Anamur I: Rettungsaktionen 1979 bis 1982* (Freiburg im Breisgau: Herder, 1983) and *Exodus aus Vietnam* (Bergisch Gladbach: Lübbe, 1986); Court Robinson, *Terms of Refuge: The Indochinese Exodus and the International Response* (London: Zed Books, 1998); Office of the United Nations High Commissioner for Refugees, *The State of the World's Refugees, 2000: Fifty Years of Humanitarian Action* (New York: Oxford University Press, 2000).

3 The number of arrivals rose from less than 27,263 for the three years between 1975–1977 to 166,604 in the first six months of 1979 alone. Grant, *The Boat People*, 31.

4 Ibid., 4, 32.

5 See for instance Neudeck, *Die letzte Fahrt der Cap Anamur I*; and Kouchner, *L'île de lumière*.

6 I am referring here to the initiative that led Kouchner and others to the chartering of the *Île de Lumière*, the first in the new category of humanitarian vessels to which the *Cap Anamur* also belonged. Significantly, in 1966, a few years before the experience of the Île de Lumière, "Un Bateau pour le Vietnam" was the name of a militant action in support of the Vietnamese Communist forces and their anti-imperialist struggle. Twelve years later, under the effects of the anti-totalitarian credo that radically transformed the French left after May '68 and led to the birth of a new wave of humanitarian actors, the same name referred to the initiative in favour of the victims of the same Communist forces. See Rony Brauman, *Penser dans l'urgence: Parcours critique d'un humanitaire* (Paris: Seuil, 2006).

7 During its first mission, there were eleven journalists on board the *Cap Anamur* (Neudeck, *Die letzte Fahrt*, 51). On the *Île de Lumière*, there was a team from Antenne 2, the second channel of French public television; a filmmaker; and a photojournalist. Kouchner, *L'île de lumière*, 76–77.

8 David Rieff, "Humanitarianism in the Aftermath of Sans-frontierisme," Médecins Sans Frontières, http://www.medicisenzafrontiere.it/Immagini/file/azione_umanitaria/rieff-web.pdf, accessed October 2013.

9 This situation is explored in Charles Heller and Lorenzo Pezzani, "Liquid Traces: Investigating the Deaths of Migrants at the EU's Maritime Frontiers" in this volume.

10 Neudeck, *Die letzte Fahrt*, 59–60.

11 Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London & New York: Verso, 2011).

12 David Macey, *The Lives of Michel Foucault* (New York: Vintage Books, 1993), 437.

13 Michel Foucault, "Confronting Governments: Human rights," in *Essential works of Foucault 1954-1984. Volume 3*, ed. James Faubion (London: Penguin, 2002), 474–75, at 474.

14 Ibid., 474.

15 Ibid.

16 Ibid., 474–75.

17 See Jessica Whyte, "Human Rights: Confronting Governments?" in *New Critical Legal Thinking: Law and the Political*, eds. Matthew Stone, Costas Douzinas, and Rua Wall Illan (Milton Park, Abingdon, Oxon: Routledge, 2012), 11–31.

18 Among the vast literature on the subject, see Michal Givoni, "Witnessing/Testimony," *Mafte'akh*, no. 2 (Winter 2011): 147–169.

19 Foucault explicitly distinguishes between "the holy indignation of the governed," which is accepted by governments as long as "it remains lyrical," and a deeper right "of private individuals to effectively intervene in the sphere of international policy and strategy," which would have been created by initiatives like the ICP (475). As Yates McKee writes, "making a political issue out of 'what is happening' would involve more than simple exposure and denunciation [...]. It would involve rendering visible and audible the grievances of those affected and doing so by means of specific techniques and policies." Yates McKee, "Eyes and Ears: Aesthetics, Visual Culture, and the Claims of Non-governmental Politics," in *Nongovernmental Politics*, ed. Michel Feher with Gaëlle Kirikorian and Yates McKee (New York: Zone Books, 2007), 328.

20 The critique of this paradigm has been at the core of a substantial body of work that would be impossible to condense here. Within this vast literature, the writings of Thomas Keenan have certainly been among the most influential for me.

21 The reconstruction of the events concerning the second episode of the *Cap Anamur* is based on interviews that I have conducted with several protagonists of the story, including Elias Bierdel, Martin Hilbert (one of the journalists present onboard during the standoff), and Dominik Berg (member of the crew of the *Cap Anamur*). I have also consulted the personal archive of Bierdel which includes numerous online and press articles, TV newsreels concerning the case, and his memoir titled *Ende Einer Rettungsfahrt : Das Flüchtlingsdrama Der Cap Anamur* (Weilerswist: Ralf Liebe, 2006).

22 William Walters, "Foucault and Frontiers: Notes on the Birth of the Humanitarian Border," in Ulrich Bröckling, Susanne Krasmann, and Thomas Lemke, eds., *Governmentality: Current Issues and Future Challenges* (New York: Routledge, 2011), 138–64, at 155.

23 Michel Agier, "The Undesirables of the World and How Universality Changed Camp," Open Democracy, May 16, 2011, http://www.opendemocracy.net/michel-agier/undesirables-of-world-and-how-universality-changed-camp.

24 See Heller and Pezzani, "Liquid Traces: Investigating the Deaths of Migrants at the EU's Maritime Frontiers."

25 Nicholas De Genova, "Spectacles of Migrant 'illegality': The Scene of Exclusion, the Obscene of Inclusion," *Ethnic and Racial Studies*, vol. 36, no. 7 (July 2013): 1180–98, at 1181.

26 Christine Bischoff, Francesca Falk, and Sylvia Kafehsy, eds., *Images of Illegalized Immigration: Towards a Critical Iconology of Politics* (Bielefeld: transcript Verlag, 2010), 9.

27 Ibid., 8.

28 Rieff, "Humanitarianism in the Aftermath of Sans-frontierisme."

29 On this see for instance William Walters, "Foucault and Frontiers: Notes on the Birth of the Humanitarian Border," in *Governmentality: Current Issues and Future Challenges*, ed. Ulrich Bröckling, Susanne Krasmann, and Thomas Lemke (New York: Routledge, 2011), 138–164; and chapter 6 of Sandro Mezzadra and Brett Neilson, *Border as Method, or, the Multiplication of Labor* (Durham: Duke University Press, 2013).

Fractured Chains of Custody

Charles Heller

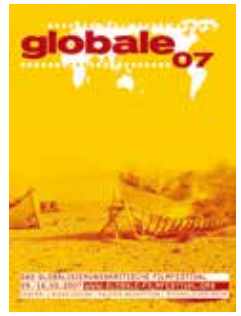


Fig. 1. Globale film festival poster, 2007.

In May 2007, the walls surrounding the Nickelodeon cinema in the center of Berlin were covered with the bright yellow posters of the Globale film festival, which each year brings together filmmakers and activists whose work reflects critically on "globalization." The image that appeared on this particular year's poster was that of wooden boats ablaze. Boats which had been built by migrants' bare hands in the southern Moroccan desert in the hope of using them to cross over to the Canary Islands. Boats that were set on fire—and photographed—by the Moroccan military after the migrants had been intercepted and captured.

The film festival had chosen this image from my video project, *Crossroads at the Edge of Worlds* (2006), which explored the networks and strategies of illegalized transit migrants in Morocco.[1] The image had been handed to me by the Moroccan authorities in the course of my research and filming. It provided a striking expression of the violence with which the desire to migrate to Europe is met. In the image, one can read the clash between the self organized networks of migrants spanning the entire Maghreb and the constantly expanding European border regime.[2]

While until 2004 migrants had paid for the services of fishermen along the coast, pressure from the European Union led to the Moroccan authorities increasing control over the fishermen's boats, forcing illegalized



Fig. 2. Gendarmerie Royale (Moroccan Police), region of Laayoune internal publication, 2005. Note the white triangles at the bottom left and top right corners.

migrants to resort to the services of smugglers who made them build their own boats in the desert. But the Moroccan police and military deployed ever more resources to patrol the desert (at times with their Spanish counterparts onboard their jeeps and helicopters), capture migrants, and destroy their means of mobility.

My use of this image followed the common impulse of human rights activism: to document legal and political abuses.[3] However, when making the video and using this image in various communication materials, I did not inquire sufficiently into the initial conditions and reasons for its production and circulation. *Why were the Moroccan military photographing these boats? What did this act of imaging have to do with the violence the images displayed?* In short, I had been excessively concerned with the "photographed event"—that which the photographic image represents—rather than "the event of photography" which, according to theorist of photography Ariella Azoulay, refers to the (co)production and circulation of the photographic image through multiple hands and spheres.[4] By drawing from some of the methodologies used by forensic science that treat the image as both practice and object, I will try to answer these questions and probe the *exposure* of illegalized migration in all the interwoven senses that this polysemic word conjures: the relation between the visual exposure of illegalized migrants; their being *ex-posed* from—in the sense of "rendered outside" of —a given legal community; and the exposure of their bodies to violence and death.[5]

The Chains of Custody

Within a legal context, establishing the chain of custody of an image is central to consolidating its truth claim. The term "custody" derives from the Latin *custodia*, "guarding, watching, keeping." The chain of custody, then, is the detailed recording of the journey of evidence (its custodial handling) from the site of a crime to the court, in order to maintain the integrity of the image. Ideally, a photograph's chain of custody should answer the following questions: "*Who captured the image and when? Who had access to the image between the time it was captured and its introduction in court? Has the original image been altered in any way since it was captured? Who enhanced the image and when? What was done to enhance the image and is it repeatable? Has the enhanced image been altered in any way since it was first enhanced?*"[6] In asking these questions, legal practice recognizes the image's material and semantic instability: all images are carriers of information that is subject to change as they move between different contexts and users, change formats, and undergo actions of cropping, sequencing, captioning, and copying. As such, in order for the law to mobilize photography's perceived claim to objectivity, it must first engage with the image's unstable "objectity" (i.e., its unstable status as an object).[7] In this the methodology associated with the practice of the chain

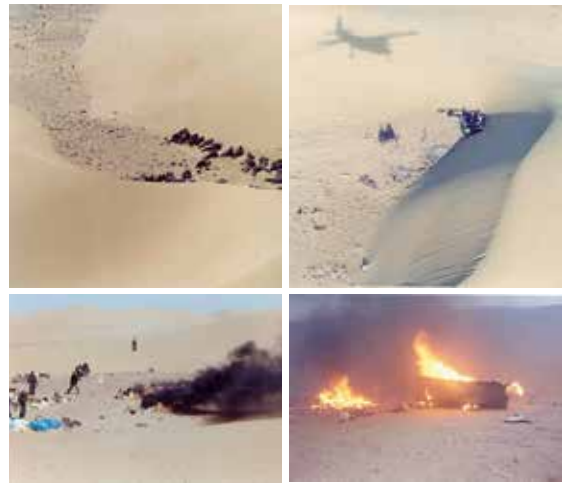


Fig. 3 a–d. Gendarmerie Royale (Moroccan Police), region of Laayoune (internal publication), 2005.

Fig. 4. Gendarmerie Royale (Moroccan Police), region of Laayoune (internal publication), 2005. Note the white triangle at the bottom left and top right of the image.

of custody echoes shifts in the understanding of images within contemporary media theory, which increasingly perceives them not only as representations of reality, but rather as practices and objects that are part of the world.[8]

The image of burning boats had been handed to the artist and theorist Ursula Biemann and myself by the Laayoune police in southern Morocco on a CD that contained over one hundred such images. Taken both from the air and from the ground, the images clearly illustrate the systematic tracking down and capture of migrants, the destruction of their belongings and, most of all, of the boats they were building.

In one of the images, the shadow of the photographer is apparent. While it does not disclose much about the identity of the photographer, it is almost certain that he is a policemen or a military officer accompanying several operations, as indicated by the systematic character of the documentation provided by the CD full of images. Furthermore, according to Hicham Rachidi of the Moroccan anti-racist organization GADEM,[9] since 2004—2005 raids performed throughout the country have been frequently photographed or filmed. The camera, then, had become just one more weapon in their arsenal. But in this very same image, another graphic element, this time less explicit, points significantly to its conditions of production and circulation: it bears a *white frame*. The image of the burning boats that I have so often used also had a frame of thin white angles of this sort, but these were always cropped out for publication. *What is this frame*?



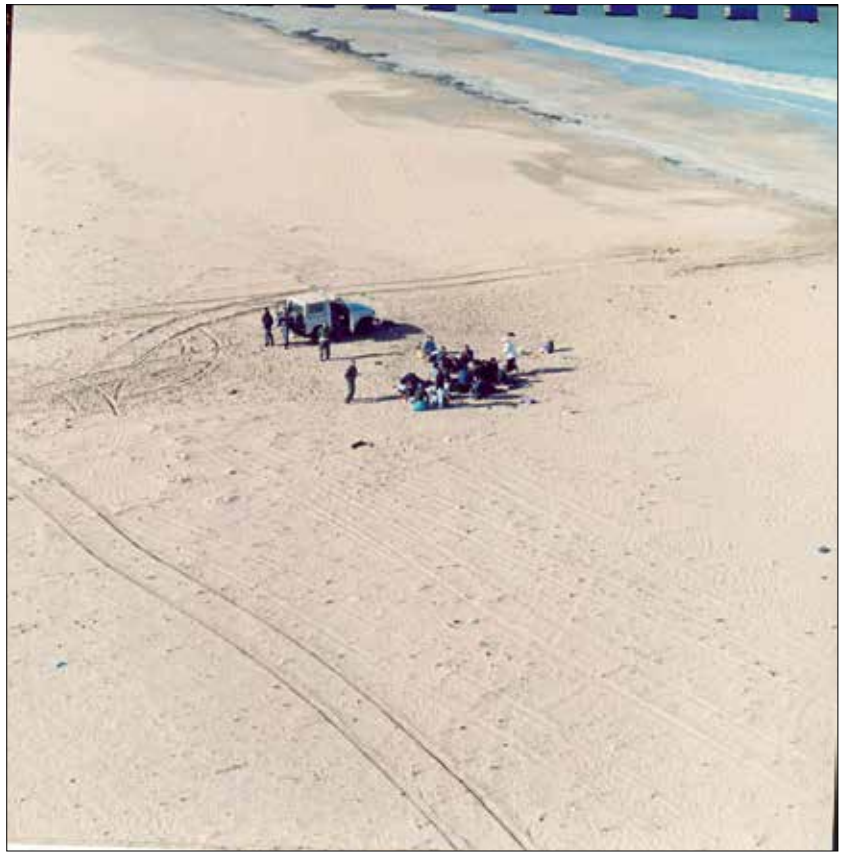


Fig. 5. Gendarmerie Royale (Moroccan Police), region of Laayoune (internal publication), 2005. Note the black frame at the top left and bottom right, and binding marks.

This image above (fig. 5) provides a probable answer to this question. In addition to a thin triangular frame that is visible as the angled black areas bordering the image (which show that it is a clumsy "image of an image") it also bears the marks of a *binding*. This establishes that the photographs of boats burning on our CD were scanned or photographed from a printed format that had been arranged for circulation and display. The hundred or so images we were handed thus record the materiality of the photographs and their storage—the "event of photography" referred to above—as much the "photographed event." While the practice of the chain of custody in the legal sphere is marked by the demand to maintain sovereignty over the image, in my attempt to understand how these images operate in the world, the material transformation of the images evidenced above is crucial. Their "borders" become the center of attention in that they point towards their status as an object and beg the question: *How and why were these images displayed by the Moroccan authorities?*

Certainly, the images were displayed as illustrations and evidence in their reports (of which they even handed us the front page; see fig. 6). Clearly, they were used as handouts for curious journalists—or for artists like us—in place of the live event of a boat bonfire on the Moroccan beach that the police were not able to present directly. *But why would the Moroccan authorities need to document the capture of migrants and the destruction of their boats so systematically? And why would they be so willing to publicize what appears to us to be evidence of violent repression?* My interpretation is that for the Moroccan police and military, these images are *evidence of a job well done.* Evidence, directed to its own population, that the Moroccan state is capable of managing the flow of people across its borders, one of the main attributes of sovereignty. Evidence, directed to Morocco's powerful European counterparts, under whose pressure the Moroccan authorities perform their duty, for which they receive significant funding. In this case we need to ask the following question: *Does the image simply document the event of violation, or is the event produced to a certain extent for the camera and with an eye on the future circulation of the image?* I believe the latter. If it is not the act of photography that sets the migrants boats ablaze before deporting them, the practice of the image has a distinct agency in shaping these events. The Moroccan police and military need less to do, than to *show that they are doing.*[10] In the process of spectacularizing the enforcement of borders through the *scene* of captured illegalized migrants, the *obscene* supplement of the political and legal production of their illegality—as well as their recruitment as precaritized labor—is left in the shadows of the *hors champ.*[11] Thus naturalized as criminals guilty of the unauthorized presence and movement of their bodies, migrants can be exposed to unlimited state violence.

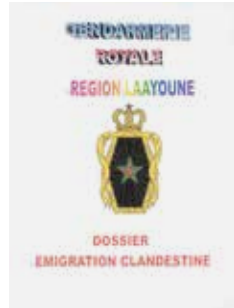


Fig. 6. Gendarmerie Royale (Moroccan Police), region of Laayoune (internal publication), 2005. The cover of the booklet reads: "Dossier: emigration clandestine" (Dossier: Clandestine Immigration).

As Judith Butler remarked in reference to the infamous images from Abu Ghraib, the image which is the product of this first act of framing—the moment the camera's shutter is triggered—may potentially be destabilized and politically contested by a second act of framing that relates to the context in which the image subsequently circulates.[12] In my video project, I attempted to reframe this image within a critical discourse on migration and migration management. However, as exemplified by the Globale festival poster, the image of burning boats was often used in communication material (both online and off), and as such migrated in a way that shattered its chains of custody. After an exhibition in Geneva in 2007, I came across a newsletter entitled *Going Home*, published jointly by the Swiss migration department (ODM) and the International Organization for Migration (IOM) to publicize their joint migration management activities.[13] The image, which had certainly been extracted from an article published on the web in relation to our own project, appeared within this document without caption. But in this new context it was literally framed by a text describing the IOM's activity in the "prevention of irregular migration and trafficking." Here, the suffering of migrants is deplored but it is once again stripped of political critique. It is the practice of smugglers that is criticized, rather than the very regime that forces migrants to resort to them. The spectacle of the suffering of migrants is used not to denounce but rather to justify the migration regime that produced it in the first place.

Through its complex and shifting trajectory, this image had thus been reassociated with the repressive government of human mobility that had produced it in the first place and from which it can probably never be entirely severed. But neither can it be from the critical discourse of those who denounce the illegalization of migration and the structural violations it generates. As I write in October 2013, a dramatic shipwreck has cost the lives of over 350 migrants only 1 kilometer from the Italian island of Lampedusa.[14] While European politicians have used this "tragedy," in their words,[15] to demand more funds for border controls, this image was picked up again by Mehdi Alioua, president of the GADEM, and used for the circulation on Facebook of a call to denounce Europe's assassination of these migrants.[16]


Going Home

Newsletter avec au retour août 2008

2. Echos des CVR et des CEP

« Parcours migratoire »

Fig. 7. *Going Home* newsletter, Swiss migration department (ODM) and the International Organization for Migration (IOM), August 2008.

The methodology of the chain of custody—the disentangling of the conditions of production and circulation of photographic images that results from a fine grained reading of their materiality—has enabled me to trace the trajectory of the very same image between different spheres and actors, its constant "migration" between those who uphold the government of mobility and those who contest it. The very possibility of this circulation should be sufficient to point to the immanence of the conflictual field of the politics of migration, in which actors are engaged in a never ending "hand to hand" struggle that is partly fought through the production, circulation, and reframing of images of the "suffering" of migrants. Used alternatively as evidence of the successful andnecessary policing of "clandestine migrants" or as evidence of the violations perpetrated in these acts of policing, the meaning and effects of the very same images may be radically altered by the technological and institutional assemblage in which they are inscribed. One might lament the risk of reappropriation of such imagery. But we may also recognize that the multifarious, contested, and unstable life of images and image practices is the very condition for them to shape the world. Whether we like it or not, the circulation of images is no more controllable than that of human beings, and this despite the practices and policies that attempt to contain their unruly freedom.



Fig. 8. Mehdi Alioua, President of the Moroccan anti-racist organization GADEM, Facebook post of the joint article, "Lampedusa: l'Europe assassine," *Libération*, October 4, 2013.

An earlier version of this essay was first presented at "PHOTO-LEXIC: The Forensic Dimensions of Photography," a conference organised by Ariella Azoulay and the Centre for Research Architecture in collaboration with the Photo-Lexic International Research Group, Minerva Humanities Center, Tel Aviv University, at Goldsmiths, London in March 2011. The original presentation was subsequently published in *Philosophy of Photography,* vol. 2, no. 1 (2011): 21–31.

1 This video was produced in the framework of the art and research project *The Maghreb Connections* (2006, curated by Ursula Biemann) which focused on the complex mobility regimes operating between the Maghreb and the European Union. The field trip to Morocco that led to the making of the video was conducted with Ursula Biemann in Summer 2005.

2 See Mehdi Alioua and Charles Heller, "Transnational Migration, Clandestinity and Globalization—Sub Saharan Transmigrants in Morocco," in *New Mobilities Regimes in Art and Social Sciences*, eds. Sven Kesselring, Gerlinde Vogl, and Susanne Witzgall (Ashgate Publishing: 2013), 175–84; and Ali Bensaâd, ed., *Le Maghreb à l'épreuve des migrations subsahariennes: immigration sur emigration* (Paris: Karthala, 2009).

3 Regarding this impulse, see Thomas Keenan, "Mobilizing Shame," S*outh Atlantic Quarterly*, vol. 103, nos. 2–3 (2004): 435–49.

4 Ariella Azoulay, "What is a photograph? What is photography?," *Philosophy of Photography*, vol. 1, no. 1 (2010): 9–13.

5 Regarding the polysemy of "exposure," see Georges Didi-Huberman, *L'Œil de l'histoire – Tome 4: Peuples exposés, peuples figurants* (Paris: Éditions de Minuit, 2012); and Georges Didi-Huberman (with an Introduction by Peter Osborne), "People exposed, people as extras" (part of "Dossier: Undoing the Photographic Image"), *Radical Philosophy*, no. 156 (July/August 2009): 7–22.

6 Eric C. Berg, "Legal Ramifications of Digital Imaging in Law Enforcement," *Forensic Science Communications* (Federal Bureau of Investigation), vol. 2, no. 4 (October 2000), available at http://www.fbi.gov/about-us/lab/forensic-science-communications/fsc/oct2000/berg.htm/. Italics added.

7 See Bruno Latour, "Scientific Objects and Legal Objectivity," in *Law, Anthropology and the Constitution of the Social: Making Persons and Things*, ed. Alain Pottage and Martha Mondy (Cambridge: Cambridge University Press, 2004), 73–113.

8 See Hito Steyerl, "A Thing Like You and Me," *e-flux journal*, no. 15 (April 2010).

9 Groupe antiraciste d'accompagnement et de défense des étrangers et migrants. See http://www.gadem-asso.org/.

10 In this sense I agree with Thomas Keenan, who writes that "there are things which happen in front of cameras that are not simply true or false, not simply representations and references, but rather opportunities, events, performances, things that are done and done for the camera, which come into being in a space beyond truth and falsity that is created in view of mediation and transmission." Keenan, "Mobilizing Shame," 435.

11 See Nicholas De Genova, "Spectacles of migrant 'illegality': the scene of exclusion, the obscene of inclusion," *Ethnic and Racial Studies*, vol. 36, no. 7 (2013): 1180–98.

12 Judith Butler, *Frames of War: When Is Life Grievable?* (London: Verso, 2010), 12–24.

13 The IOM is the main international agency governments resort to for the management of migration beyond their borders. Although it claims to "promote humane and orderly migration for the benefit of all" it mostly contributes to imposing the inhuman order of capital and nation states on the movement of people. See Martin Geiger and Antoine Pécoud, eds., *The Politics of International Migration Management* (London: Palgrave Macmillan, 2010).

14 See "More than 350 people feared dead in wreck 1 km from Lampedusa," WatchTheMed, October 3, 2013, http://watchthemed.net/reports/view/31.

15 See for example Commissioner Malmström's intervention on Lampedusa during the Home Affairs Council press conference, Luxembourg, 8 October 8, 2013, http://europa.eu/rapid/press-release_MEMO-13-864_en.htm.

16 Olivier Clochard, Stéphane Maugendre, Abderrhamane Hedhili, Filippo Miraglia, Mehdi Alioua, Karim Lahidji, and Michel Tubiana, "Lampedusa: l'Europe assassine," *Libération*, October 4, 2013, http://www.liberation.fr/monde/2013/10/04/lampedusa-l-europe-assassine_937029.

The Coming Storm and the Changing Shoreline of Kivalina

Modelling Kivalina (Andrea Bagnato, Helene Kazan, Hannah Meszaros Martin, Daniel Fernández Pascual, Alon Schwabe)

In July 2013 the Modelling Kivalina group travelled to Kivalina, a barrier island situated off the northwestern coast of Alaska, and home to four hundred native Iñupiaq people. The group was invited to the community by the Anchorage based Re-Locate project, an initiative that works with the Kivalina community to explore alternative modes of dealing with climate displacement and relocation. The project initiated a modeling process involving various stakeholders, both from the village and the government, who are attempting to deal with the various political, legal, and environmental transformations that shape the island of Kivalina today.



Fig. 1. Aerial view of Kivalina from the southwest, the direction from which autumn storms come. Photo: Michael Brubaker, 2011.

Introduction

Barrier islands like Kivalina run parallel to the coastline; and the coastal currents, which carry in and strip away sediment, determine the island's movement in relation to the shore, which is itself in movement. Barrier island formation relies on consistent ocean levels to maintain the sediment deposits necessary for the island's growth. Once formed, they provide a buffer for the coast, mitigating the potential harm caused by waves and storm surges.

Before they were forced to settle there in 1905, Iñupiaq people used the island of Kivalina as a summer encampment. The Bureau of Indian Affairs (BIA) built the Kivalina school and threatened the seasonal residents with imprisonment if they did not enroll their children. This process sought assimilation through education and was designed to immobilize native communities by eradicating their traditional migration patterns, and thus their culture. With the arrival of the school, the once migratory residents became static on a migrating island. Their territory, a vast open use landscape, was suddenly constrained into an enclosed grid of property lines.

The Kivalina school stands on the ocean's edge on the southern tip of the island. In autumn, storms blow in from the southwest, bringing in fierce ocean swells, which in turn shift the coastline. In 2006, the United States Army Corps of Engineers produced a report that concluded that the island's eroding shoreline, accelerated by the effects of climate change, posed an imminent threat to the existence of the entire village.[1] According to their projections of future shorelines, the school would be the first structure to fall into the sea. The report concluded that the shoreline was eroding at an accelerated rate due to a lack of sea ice during the autumn storms, which in the past had protected the island against waves and storm surges. The lack of sea ice could be attributed to a warming earth, a changing climate.



Fig. 2. Still from *Native Village of Kivalina v. Exxon Mobil* at the US Court of Appeals for the Ninth Circuit, San Francisco, November 28, 2011, www.ca9.uscourts.gov/media.

The conclusion that climate change was accelerating the shoreline's erosion led the residents of Kivalina to file a lawsuit against twenty-three of the largest oil and gas companies in the world, accusing them of contributing to climate change through the emission of greenhouse gases, and thus to the loss of their natural environment. In the case, the petitioners struggled to establish direct causal chains of responsibility due to the fact that, by nature, climate change is a distributed and complex process, spanning the whole width, depth, and molecular structure of the earth, sea, and sky. As such, this case raised urgent questions concerning legal accountability in a world where climate change is exacerbating existing inequities and contributing to an increasing number of displaced peoples and cultures. Against this backdrop, we, Modelling Kivalina, propose that the island of Kivalina be understood as a model on various levels—a microcosm of the world reorganized under a new climate regime.

Native Village of Kivalina v. ExxonMobil did not result in prosecution. On May 20, 2013 the Supreme Court denied a request for the decision to be reviewed, upholding the ruling of the Court of Appeals for the Ninth Circuit in favor of the energy companies. The Ninth Circuit relied on a previous case which stated that the Clean Air Act displaced federal common law in relation to greenhouse gas emissions, instead making the village's injuries the responsibility of the government.[2] The court stated that "federal common law addressing domestic greenhouse gas emissions has been displaced by Congressional action. That determination displaces federal common law public nuisance actions seeking damages, as well as those actions seeking injunctive relief. […] Our conclusion obviously does not aid Kivalina, which itself is being displaced by the rising sea. But the solution to Kivalina's dire circumstance must rest in the hands of the legislative and executive branches of our government, not the federal common law."[3]

The court recognized its own limits, which were established by two kinds of displacement: the first was the determination of greenhouse gas emissions as being beyond the jurisdiction of federal common law, therefore displacing any possibility of legal action; the second displacement was that of Kivalina itself, which the court did not deny, just as it did not dispute the rising sea (another form of displacement). What the law in effect announced was that it could not house a rising sea, any more than it could house the future of the residents who live on the one-square-mile spit of sand in Kivalina.

In July 2013 we travelled to Kivalina to investigate and translate these issues into another kind of model—a physical model of the shoreline—that could draw out further the relationships between the institutional, legal, and environmental forces operative in this region. It was from the failure of the shoreline to remain intact and the failure of the legal forum to address the issues of climate change—a failure both of "natural" stability and, as we would find out, of the human imagination—that our project began.

Modelling Kivalina is an attempt to address the problems of representation: on the one hand, of environmental forces; and on the other, of abstract legal concepts and of social and political relations. The conflict of space in Kivalina resides in the fact that *land* is not an abstract concept; yet in Alaska, as part of a colonial project, law has been used to abstract the territory through the reorganization of traditional ownership structures. In the model, the design challenge was to remake this abstraction and relocate it within the physical world.

Through the act of modeling, we sought to lay out a critical network of relations between environmental structures, social structures and patterns of governance. By tracing the history of domination through the geological surface and subsurface, we attempted to map out the progression of state governance over the landscape. The model, which began as a small three-dimensional representation of four elements—the surface of the island and the village infrastructure; the ocean and lagoon; the geological substrata; and the shoreline in its past, present, and predicted future conditions—was designed so that it could be continuously taken apart, reassembled, and modified, in order to adapt to all possible conversations taking place around it. In this way, the model worked through a continuous process of redefining limits: the limits of law, of territory, state and non-state sovereignty, and the limits of the shoreline itself.



Fig. 3. View of the island's lagoon shoreline as seen from the mouth of the Wulik River, 2013.

Excerpts from July–August 2013: London to Alaska

Level Zero

The shoreline is where land, water, and air meet. Air mediates the relationship between land and water. Atmospheric pressure is the basis for measuring territorial elevation—for establishing the Mean Sea Level. Adding air's own weight into the equation introduces a vertical dimension to the shoreline. Although understood as the "zero" level, the shoreline has never been flat or fixed. While the shoreline of Kivalina has been shaped by natural and man-made forces from the past, it is the *future* of the coast that is contested. If the shoreline is considered as an elastic, four-dimensional phenomenon that expands and contracts in width and depth, changing over time and in various registers (ranging from geological time to the temporality of an uncertain future, expressible using a broad lexicon of terms of prediction, scale, and disaster) how might we model that line to incorporate a whole spectrum, from the microscopic to the macroeconomic?

When we began to design the model of Kivalina's shoreline, we were not certain what the true "level zero" actually was. The model needed



Fig. 4 a, b. The results of the Army Corps coastal erosion study carried out in 2006, marking the former and predicted positions of the shoreline in Kivalina. Source: Army Corps of Engineers Alaska Village Erosion Technical Assistance Program, *An Examination of Erosion Issues in the Communities of Bethel, Dillingham, Kaktovik, Kivalina, Newtok, Shishmaref, and Unalakleet*, April 2006.

a predetermined *sea level*—a physical constant from which the island's elevation and seabed depth could be determined. But there is no level zero as such: how could the elevation of Kivalina in relation to sea level serve as a consistent base when both the land's elevation and the sea level are in constant and uncertain flux? Seeking to represent dynamic environmental forces such as erosion, varying wave heights, storm surges, and changing air temperatures, which element could we take as a constant against which to demonstrate these processes? The model was built in such a way as to leave these questions of scale in flux. Thus, we chose to build three shorelines, all of which could be removed, like all parts of the model, based on the information we received during each interview. The three lines were based on an image produced by the Army Corps of Engineers that was included in the 2006 report on erosion in coastal communities mentioned above. We knew that the island's nature was uncertain and tried to design under the constraints of this uncertainty—knowing full well that each of our projected shorelines could either be wrong or become wrong, or in the next second become right, and then, just as quickly, fall apart.

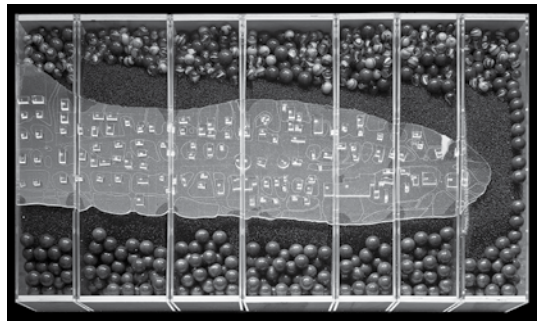
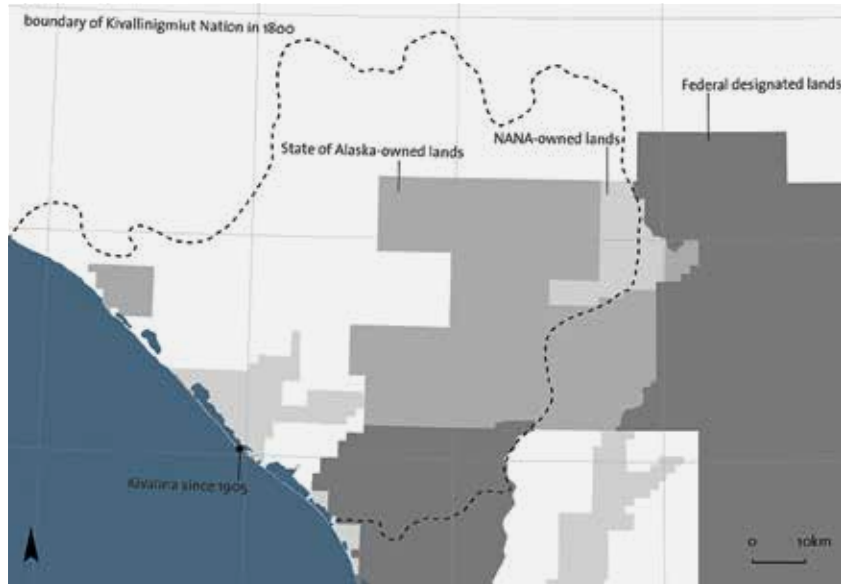


Fig. 5. Top view of the model, 2013.

Land without Title
The Alaska Native Claims Settlement Act

In order to understand the progression and influence of state governance on Kivalina's landscape, we needed to be able to map the historical patterns of land ownership. The United States bought Alaska from Russia in 1867. From this moment onwards, tribal status and aboriginal title were continuously redefined within the US legal system.[4] This series of legislations produced legal uncertainty as the US court system struggled to define what communal land meant within the boundaries of a nation state. In 1971, the Alaska Native Claims Settlement Act (ANCSA) effectively extinguished the status of all communal and aboriginal land in the state by converting "the communal aboriginal claims of the Alaska Natives into individual

Fig. 6. Drawing of Ernest S. Burch's map of the traditional stateless nation of Kivalina overlaid with ANCSA fragmentation of land ownership. Image made by Modelling Kivalina based on NANA Regional Corporation Land Status map, NANA Lands Department, 2003, and Ernest S. Burch, *Social life in Northwest Alaska: The Structure of Iñupiaq Eskimo Nations* (Fairbanks: University of Alaska Press, 2006).



private property, represented by shares of stock in more than two hundred Native, regional, village, urban, and group corporations."[5] ANCSA not only dissolved the concept of communal land but redefined private property, abstracting it into shareholdings held within corporations. As such, the right to own land was taken out from under the feet of Alaska Natives and placed under the governing authority of a Native Corporation.

When ANCSA was enacted, the Village Corporation of Kivalina received the title to the surface of their land. The regional corporation, NANA, received the title to the subsurface.[6] The legally defined "surface" extends down four feet only. In 1976 the Kivalina elders decided to merge the village corporation into NANA, which meant that the village lost its surface title. As a result, the houses on the island now sit on two layers of earth that they do not own (surface and subsurface) and all the resources (mineral and otherwise) are under NANA's control. Through these legal acts, Kivalina became a people without land and without title.

Kivalina: 67.72°N: 12/07/2013
The Shoreline from Three Vantage Points

At the water's edge, we are looking out to the horizon. At the end of the earth there are islands that we couldn't see yesterday, sitting on the water like clouds clinging to mountains. Something is happening on this horizon, up above the Arctic Circle, now in mid-July, now in full and perpetual sunlight. We are looking at a Fata Morgana of the Arctic; a thermal inversion, when the heat of the earth's surface and the sky don't match, and so the heat of the sky pulls the land out, and up, upwards into the atmosphere,

creating towers of land, hovering islands, glaciers upon glaciers. Actually, it is not land that we see from our vantage point but the light. Light travels in a straight line only when the medium through which it travels is uniform. We see only light. We wonder if the temperature keeps increasing on this planet, whether we will see more arctic Fata Morganas, the heat generating greater and greater illusions. Or maybe the phenomena will disappear altogether as the heat of the ocean and the air merge and we lose all magic. But in the coastline of our imagination heat has been shrinking the earth, eroding the shoreline. At least that is what we are told.

Towards the sky, we look up into a night with no stars. We are looking for one star—the North Star—which David, a hunter from Kivalina, tells us has moved in the sky. This was during our first interview using our new modeling platform. The model sits on a large piece of white paper, which serves as a stage; around the paper we place different "props": roads, hills, animals, legislatures, reports, and waterways. David tells us how each element has moved around Kivalina. The star is one of them.

> I noticed the north star was in a different spot, the north star used to be right around there, in that direction and now it's shifted. That I noticed, in the last five years. Not before we started to lose our beach but after—it's moved.



Fig. 7. Arctic Fata Morgana, as seen from the shoreline, looking out towards the southwestern horizon, 2013.





Fig. 8. (above) The model meets David Adams in Kivalina's community center, 2013.

Fig. 9. (below) The model meets Kivalina's City Council, where a member indicates an old grave site underneath the water tower, 2013.

Later we learned that the North Pole is shifting all the time, and that scientists foretell an increased movement because of the warming climate. So maybe our own North is the one that is changing—not the star.[7]

But under the earth there are remains that we have not considered. This becomes apparent when we speak to the City Council. We place the model in the center of the table. Immediately, the conversation goes underground. Colleen Swan, a member of the city council, tells us that in this ground "there was once an old tooth that went missing, from a girl from long ago. […] agencies come and then things go missing": it is not only the teeth but the land that held all the teeth that went missing along with the agencies. The houses that sit on the gravel—gravel that belongs to the regional corporation—now cover up the remains of houses that were once made from sod, half-underground, half-above. The island is half-graveyard, and the remains of the houses' inhabitants are spread out under the houses. One man in the room gets up to locate a burial site underneath the village's water tank. We place a small cross under the topsoil below the tank. Agencies are no longer the only forces that come and take away the remnants of the past. There is a fear in the village that if the erosion takes too much of the earth, it will expose these graves. Even worse, they could fall into the ocean, disappearing in a storm surge, along with their historical claim to the land.

The Changing Nature of White

Today the fog came in so fast. We could see it come over the sun; it was almost midnight and we were out filming the shoreline to mark the ending of the day and the new one beginning. The fog was way out at sea. David told us earlier how to tell the difference between the earth and water when everything is covered in ice. "With real cloud and low fog, you can see the difference when you are looking out at the ocean—it's lighter, you can go right on the edge if you know where the beach ends […] and you can see a lighter side and a darker side, the land is darker and the ice is brighter. That's how our ancestors could tell if they were on land or ocean. Right on the border you can see the difference." Our model now needs to adopt several more kinds of white. And these shades of white are changing. Yesterday, an elder told us how the seal skins used to be white after they were cleaned. But now they are different; no matter how hard you scrub, they stay yellowed, always in a shade of off-white. We wondered if this was because of the toxins which



Fig. 10. Aerial view of Kivalina covered in snow, 1985. Photo: Tom M. Hanifan, ex-school principal, Kivalina.

accumulate in seal fat, traveling from far away; or maybe it is the air between the eye and the skin, filling with new particles, also from far away. Global Distillation is the process by which Persistent Organic Toxins accumulate in the earth's poles due to the vaporization of these substances in warmer climates, and their condensation when they move into colder climates. Here in the cold of the Arctic they are unable to vaporize back into the air.

Thus the greatest concentrations of toxins can be found in the poles of this earth, both in its inhabitants and in the environment.[8] Biological magnification further augments toxic levels as there is a higher fat content in the wildlife species from the poles, whose meat is the main dietary source for the inhabitants of the North. So the skin and the fat and the air in between are all changing, all recorded in a seal's skin that once hung in the clear air, pure white against the bright white of the snow.

White even turns into other colors now. The tundra is turning green, as trees are growing further and further north. Also on the high alpine mountains the tree line gets higher and the white tops disappear. Even the ice around Kivalina is becoming green. Algae bloom beneath the thinning ice that was once too thick to let sunlight through. We also hear stories that algae now grows above the ice, turning it rust red as it melts (a little earlier than before) in springtime.

Back in Anchorage, having left Kivalina, we are traveling along the coast on the Seward highway. Michael Brubaker from the Alaska Native Tribal Health Consortium wants to show us climate change in action. On the side of the highway to our left we can observe the advancing green of the hillsides. Mountaintops that were once snowbound all year are now barren, waiting for the green from below to overtake the peaks. But we are driving to witness the recession as well, the recession of glaciers all viewable from the highway.



Fig. 11. The model meets Michael Brubaker and the melting Portage Glacier, 2013.

He stops on the side of the road to show us fireweed, a plant with a long thin stem and bright pink flowers. He says that the plant is used as a calendar. Everyone watches the fireweed. The petals fall off in a gradual sequence from the bottom to the tip. When all the flowers are gone, it means that there are six weeks



Fig. 12. Brubaker shows us fireweed growing on the side of the highway and explains its various uses, including its function as a natural calendar, 2013.

left until the first snowfall. Everywhere we look in Alaska there are what would have been considered at some time "natural" countdown systems. The two-thousand-square-mile area of the former Kivalina Estate lives within these systems: among the dying plants that warn us of early winters, thinning, and blooming ice warning us of early spring, and the moving stars that tell us that the systems of the whole earth are changing. The shoreline encompasses these countdown systems, through lost and gained dynamism, through a series of lifespans that are linked together—that of the rock revetment, then the shoreline, the houses and buildings, the village, and finally the collective body of the village. The island is living and watching the green of this earth creeping higher and signaling the early end of something else.

The Failure of the Imagined Coast

In a small office in the Department of Transportation we meet with two coastal engineers, Harvey Smith and Ruth Carter. Here, at the end of our journey, a new word enters our lexicon: "accretion." The counterprocess to the ever destroying erosion. The shoreline is, of course, a product of both forces. So why had this word not appeared in our interviews until this moment? Ruth explains:

> There was a lot of money dumped into this whole thing [the Alaska Baseline Assessment and Coastal Control Action] and there is no money in a simple solution. The Army Corps of Engineers is this huge hungry beast that is not being fed very well right now, with all the cuts in congress and such. They got all this money to do baseline erosion



Fig. 13. The bank of the Wulik River, where the residents of Kivalina collect fresh water, 2013. Due to an increase in temperature, willow trees are able to grow in the summer, thus creating an insulation layer on the surface of the soil that makes the underground permafrost melt.

> analysis and had unskilled, not well specialized, uneducated people, and they went out to the villages and asked people, "Are you experiencing erosion?" And everyone said, "Yes, of course." And they don't go out and ask, "Are you experiencing accretion?" In fact any time they found accretion they didn't know what to do with it, so they threw it out as bad data. So after this huge effort with a lot of misinformation, a planning study is being used as an engineering document, and engineering decisions are being made on it.

In her story, Kivalina and other native coastal villages in northwestern Alaska have been used as testing grounds which in turn become a series of financial, infrastructural, and emergency response models. These model villages are then capitalized upon in order to secure future funding for the myriad of agencies responsible for Kivalina's infrastructural development. Climate change provides a vehicle for this economy—an economy that operates through the imagination of future disasters. By creating not only lack but also the very much present threat of a future catastrophe, the Corps was financially enabling itself to provide the response. Here, the same story of Kivalina is retold with a different ending: we find a small island of four hundred people who are told that their land has a twenty-year life span, which has supposedly been calculated based on the effects of climate change. This calculation necessitates the residents' immediate removal. The calculation also sends the community into action, into legal action, opening up one of the biggest climate change litigations in the history of the United States. At the end of Ruth's tale however, the threat of destruction turns out to have been fabricated through a process of misplaced coefficients, bad science. The practice of risk management seemingly replaced science altogether, as a new form of credibility and legitimacy. Our future shoreline, a thin piece of copper that cut into the island, threatening the school, was now the product of the wrong coefficient. It was removed from the model.

In the beginning of our story, the Kivalina school produced an enclosed territory, a territory that was bound by the shoreline of the island. The state of Alaska was founded on the same doctrines of Discovery and Frontierism that enabled it to defeat and capture both nature itself and the people within it. In this story, the state brings the frontier to the sea—and the sea is the last frontier. That is how the shoreline was produced and continues to be remade.

In another story, however, the school is the first structure to fall into the sea of the future storm. "Nature," or what remains of it, is still the central destructive protagonist, the force that will bring an end to the school, and therefore the island, as it cannot exist without this structure. The school is the original containment, the arrival of the federal government, the original colonization of the mind and body. The school became the land, and the future catastrophe that lies within the "eroding" shoreline would not exist without the school which produced it in the first place.

Through such failures—both structural and imaginary—a whole economy of climate change and disaster mitigation is produced, replicated, and enforced across the globe. Another vision is produced: one of the coastline of the world becoming a threat to civilization. An elder tells us about hearing of far away places like Tuvalu, a small island like theirs, falling away due to the same consequences of climate change that are effecting the coastline of Alaska. Our own imagination of climate change has produced fear and panic, which has enabled the economy of climate change mitigation to develop. This is the downfall of a unified vision, of the imagined and as yet unrealized image of the coastline of the world, disappearing at once into an overflowing sea.

Inside the school in Kivalina we all sit together in a public meeting with different community members, NANA, and the Army Corps of Engineers. Now, in late July, the village begins to worry about the approaching autumn storms. Ironically, the school is also the village's emergency shelter. They want a way out, a road to take them away, away from the disintegrating shoreline, and the school that lives on its edge. A representative of the Army Corps talks to them about the cost benefit analysis of building an evacuation road. Another reiteration of a process that offers no real remedy, no solution for the island of Kivalina, falling away or not; this is not the root of the problem. As Colleen Swan tells us:

> It all began with the economy, with economic development. So people had to come in and tame the savages and make them dependent and not able to think for themselves. It's still a problem, people are still dependent, they expect someone from the outside to come and solve their problems. That's my big issue right now. Trying to go back and trace those things. Our problem, I think, goes all the way back to the introduction of the Doctrine of Discovery. So, traveling back in time, and then starting to move forward, correcting those things that were done to our people. I think the hardest part would be to convince the people that these things were wrong. That they were wronged.

1 Army Corps of Engineers, Alaska Village Erosion Technical Assistance Program, *An Examination of Erosion Issues in the Communities of Bethel, Dillingham, Kaktovik, Kivalina, Newtok, Shishmaref, and Unalakleet*, April 2006, http://www.poa.usace.army.mil/Portals/34/docs/civilworks/currentproj/AVETA%20Report.pdf.

2 Am. Elec. Power Co. v. Connecticut, 131 S. Ct. 2527 (2011).

3 Native Village of Kivalina v. ExxonMobil Corp., 696 F.3d 849, 856-8 (9th Cir. 2012), at 11657.

4 David Case, *Alaska Natives and American Laws*, 3rd ed. (Fairbanks: University of Alaska Press, 2012). See chapter 2 for a description of the Tee-Hit-Ton Indians v. United States, a landmark case, which removed the right of Native Alaskans to seek compensation for aboriginal lands.

5 Ibid., 167.

6 NANA is not an acronym.

7 See Richard A. Lovett, "Polar wander linked to climate change," *Nature*, May 14, 2013, http://www.nature.com/news/polar-wander-linked-to-climate-change-1.12994.

8 "Indigenous peoples in the Arctic, whose traditional diets are heavy in fatty foods and who often have no alternatives for nourishment, thus have some of the highest recorded levels of POPs." United Nations Environment Program (UNEP), "Ridding the World of POPs: The Stockholm Convention on Persistent Organic Pollutants," http://chm.pops.int/Portals/0/Repository/CHM-general/UNEP-POPS-CHM-GUID-RIDDING.English.PDF, at 6, accessed September 2013.

Black Atlantis: Three Songs

S. Ayesha Hameed



Fig. 1. J. M. W. Turner, *Slave Ship (Slavers Throwing Overboard the Dead and Dying, Typhoon Coming On)*, 1840 (detail). Oil on canvas. 90.8 x 122.6 cm. © 2014, Museum of Fine Arts, Boston. Henry Lillie Pierce Fund, 99.22.

Storm

In 1840 J. M. W. Turner painted *Slavers Throwing Overboard the Dead and Dying, Typhoon Coming On*. The sky is red and purple and gold and blue which shifts to frothy white. In the white a ship's masts faintly recede. The water is brown. In the right hand corner is a leg with a manacle round the ankle. There is perhaps a shadow of an arm but it is hard to tell as in the water around it are the ghostly maws of fish with puckered mouths and dark eyes, and seagulls diving into the water.

In 1781 the crew of the English slave ship *Zong* threw their slaves overboard in a calculus that determined that the insurance money for their death was worth more than the profit gained from selling their lives. As ships crossed the Atlantic it was a common practice for the captain and crew to jettison cargo in storms, but in a few instances such as on the *Zong*, it was slaves who were thrown overboard—an action that raised the issue of whether slaves were legally defined as people or property, and what constituted an unforeseeable event: what in insurance terms would be defined as an "act of God." This was an ambivalence that played out in insurance claims in court, in art and literature, in the fuelling of the abolitionist movement, through a cast of characters that included the weather, slaves on boats, and the boats themselves.

In any account of the slave ship *Zong* Turner's *Slavers* is the image that accompanies it. But as the Atlantic historian James Walvin points out, in fact this is not the *Zong*.[1] There is no image of the *Zong*, nor was there a storm at sea that precipitated the massacre.

Be that as it may this painting is the stand-in for the *Zong* massacre which has no image and happened on still waters. In this storm the water, the limbs of slaves, the mouths of hungry fish, and the gawping birds become the ecology of the brown water of the sea. I keep returning to the fact that there was no typhoon, that the storm is an imagined one that has become appended to the lore of the slave ship *Zong*. How was it possible to append a storm to the massacre aboard the *Zong*? Or in other words, what is it about storms and what does it mean to imagine one onto history? Storms become a point of entry to think about how nature in flux is invoked in a sociohistorical inquiry.

Stillness: In his account of the Mediterranean, Fernand Braudel describes the variegated landscape of the sea as comprising three temporalities.[2] The first, and the slowest register of time, is environmental and geographical time that moves cyclically and imperceptibly. The second register measures long term social and economic changes that take place over centuries; while the third is the shortest measure of time—that of events and people—the time of surfaces.

The storm is a concatenation of rain water, blustery wind, and crashing waves—a catalyst that puts into motion a chain of events on board a slave ship that refracts the zeitgeist of chattel slavery and maritime insurance. This is all at the surface of the ocean. When slaves are thrown overboard then the depth of the ocean comes into focus.

Flux: consider plotting the ocean vertically to its depths and through disruptions instead. A Storm then operates on the surface of the water, at the moment when slaves are thrown overboard, swirl into the rain overhead and the wind. A *Shipwreck* then measures the depth of the ocean, through the figure of the pearl diver who follows the detritus of a ship to the bottom of the sea and, by discovering it, transforms it into something magical. And a *Tsunami* focuses on the ocean floor in its contiguity with the Atlantic mountains that flank it, raising the question: how does the land under the sea operate as an extension and laboratory of the land around it? Which strangely enough leads us to an electronic band from Detroit called Drexciya whose mythos, built through liner notes, describe a story where the children born of pregnant slaves thrown overboard were able to adapt to living underwater as they went straight from living in amniotic fluid to ocean water, and so built a Black Atlantis called Drexciya.

During the greatest Holocaust the world has ever known, pregnant America-bound African slaves were thrown overboard by the thousands during labour for being sick and disruptive cargo. Is it possible that they could have given birth at sea to babies that never needed air? Are Drexciyans water-breathing aquatically mutated descendants of those unfortunate victims of human greed? Recent experiments have shown a premature human infant saved from certain death by breathing liquid oxygen through its underdeveloped lungs.[3]

A key aspect of the Drexciya myth is its temporal proposition: to see time and history as equally in flux as the lapping ocean, to see the afterlife of the middle passage in a futuristic scenario. Its soundtrack is the sound of sonars, of static, of distance. In the "Bubble Metropolis" (1993) The Drexciyan Cruise Control Bubble 1 calls to a passing ship to slow down, to proceed with caution on the aquabahn at the bottom of the sea.

Shipwreck

Full fathom five thy father lies,
Of his bones are coral made;
Those are pearls that were his eyes,
Nothing of him that doth fade
But doth suffer a sea-change
Into something rich and strange.
—*The Tempest,* 1.2.[4]

Or so sang Ariel in that storm of storms, *The Tempest,* to lure Ferdinand away from the shipwreck and shore, further into Prospero's magical island and to Miranda. Hannah Arendt likens Walter Benjamin's historical method to that of a pearl diver who finds Ferdinand's father at the bottom of the sea, transmuted into bones of coral and the eyes of pearl. But rather than bringing his body to the surface, the pearl diver leaves the remnants there.

Like a pearl diver who descends to the bottom of the sea, not to excavate the bottom and bring it to light but to pry loose the rich and the strange, the pearls and the coral in the depths, and to carry them to the surface, this thinking delves into the depths of the past—but not in order to resuscitate it the way it was and to contribute to the renewal of extinct ages. What guides this thinking is the conviction that although the living is subject to the ruin of the time, the process of decay is at the same time a process of crystallization, that in the depth of the sea, into which sinks and is dissolved what once was alive, some things "suffer a sea-change" and survive in new crystallized forms and shapes that remain immune to the elements, as though they waited only for



Fig. 2. Henrietta Marie Seed Beads. Photo: Dylan Kibler/Mel Fisher Maritime Museum.

the pearl diver who one day will come down to them and bring them up into the world of the living—as "thought fragments," as something "rich and strange,"…[5]

Let me unpack this a bit. The power and authority of tradition has been destroyed in the present—through the ravages of the great wars and shell shock, through the rise of the right in the 1930s. Benjamin, as with everything, is ambivalent as to whether this is a good thing or not, but no matter what, history cannot be recounted in monumental terms. The transmissibility of history is not possible; rather, it has been replaced by its citability, wrested from its context, broken up, and broken down. What is cited are fragments of objects that come from a despair born of the present moment and the desire to destroy it . This destructive impulse stems from the hope that such fragments will preserve the past by citing it and making clear that there is no continuity of tradition that links that object to the present. As Arendt says, "the past spoke directly only through things that had not been handed down, whose seeming closeness to the present was thus due precisely to their exotic character."[6]

The method of excavating these objects is by incanting spirits from the past. The release of the past into the present is through the release effected by drilling into such objects, monads, who in their fragmentary nature encapsulate and evoke the richness and totality of the historical moment. These past objects séance-d into the present have undergone a "sea change."

Ariel's song reflects this. Eyes have turned into pearls. Bones have turned into coral. Your father's body will not be brought to the surface whole, his body is not his body anymore anyways. It has turned into something strange and magical.

"After the storm the theorist as storyteller is like the pearl diver who converts the memory of the dead into something 'rich and strange,'" says Seyla Benhabib.[7] The father's bones form the corpse of historical tradition, pearls are objects of history broken down and wrested out of the wreckage, and Benjamin is the pearl diver who plucks the treasure. The pearl diver is a metaphor here for collecting quotations but what if *The Tempest* was a play about a storm and a slave ship, and what if after the storm the pearl divers plunged from the now still surface of the water to the ocean floor?

From this, the task of the pearl diver contains two temporalities.[8] By dint of discovering the body underwater, eyes turn into pearls and bones into coral. This is the process of crystallization that makes the monad come into being. Such monads once excavated, form a constellation that together conjure an historical event into the present. The decay of the living, historical object is simultaneously its crystallization into a monad.

The sinking of the slave ship makes literal these two moments where Arendt's figure of the pearl diver's discovery at the bottom of the sea, crystallizes historical fragments into monads.

One moment follows the diver as he plunges to the ocean floor and crystallizes fragments of what he finds into a constellation of monads. Here the pearl diver finds a slave ship, the *Henrietta Marie*, on the ocean floor. The ship is a monad and within the ship is a constellation of other charged objects: slave shackles and objects of barter for slaves in Nigeria, trinkets, crockery, weapons. The slaves on board the ship were sold before it sank so the only material witnesses of their recent presence onboard are their shackles and the medley of objects that were used to buy them. Treasure into shackles and the pressure of the ocean on the sea floor that simultaneously preserves, transforms, and destroys these objects. But these objects are not connected metaphorically in this constellation—they are connected by the system of equivalence that pulls them into contact through its absent protagonist, its common denominator: the price of a slave at the time.

The second moment lies in the turning of eyes into pearls and bones into coral. Or in other words the moment the body ceases to be a body and turns into a thing. But not just a thing, a *valuable* thing, a treasure. The body is of the slave, interpellated into the law. *Bones into coral and coral back to bones*—there was a basic instability within English law in which the Black African alternated between being defined as person or property.[9] This is a battle between land and sea—or more precisely between the laws that regulated the land and the laws of the seas. The legal precedent established at sea by the Navigation Acts inevitably saw Black Africans as property; while on land the writ of the *habeas corpus* made illegal the restraint on movement of anyone on English soil and gave everyone the right to not be deported from England.[10] The sea, the home of the Navigation Acts, turns the Black African into property, a thing: it turns eyes into pearls and pearls into even more treasure. While on land, the *habeas corpus* redefines the Black African as a person: it turns pearls back into bones.

The process of transmutation is what I am most interested in —from living entity to an object rich and strange whose natural home is the sea bed, and which can withstand the elements underwater. This transition from living entity to corpse to the riches of the sea—pearls and coral—is an anthropocenic moment dissolving the human into nature, the living into something fossilized, but as an uneasy and radioactive fossilization.

But rather than bringing it to the surface why not just dive right down to the bottom?

For pearl diving, as Benjamin would say, is not "an unveiling which destroys the secret, but the revelation which does it justice."[11]

Tsunami

On November 1, 1967, Maltese Ambassador Arvid Prado delivered a speech to the United Nations General Assembly. He had the sea on his mind, more specifically the bottom of the sea and its riches—nodules of manganese and copper that were in short supply on shore. There was at that time a huge interest in the exploration of the surface of the sea floor and the commercial extraction of these nodules in the 1960s and '70s. Although he advocated for an equitable distribution of the wealth of the sea floor between rich and poor nations, the language he used was an almost mystical blending of commerce, the law, and the romance of the sea.

> The dark oceans were the womb of life: from the protecting oceans life emerged. We still bear in our bodies—in our blood, in the salty bitterness of our tears—the marks of this remote past. Retracing the past, man, the present denominator of the emerged earth, is now returning to the ocean depths. His penetration of the deep could mark the beginning of the end for man, and indeed for life as we know it on this earth: it could also be a unique opportunity to lay solid foundations for a peaceful and increasingly prosperous future for all peoples.[12]

At the heart of Pardo's mission are two ships: the *Santa Catarina* and the HMS *Challenger*. The *Santa Catarina* was a Portuguese ship that was seized by the Dutch East India Company in 1604 near the Malacca Straits. To allay the misgivings of stakeholders in the company, a young Hugo Grotius was retained to provide a rationale for the seizure. From this came his landmark text *Mare Liberum*, a chapter from a longer work on the laws of prize and booty called *De Jure Pradae*. Although this text was written in response to this specific case and not as a more general legal study, the scope of the

argument ambitiously dismantled the medieval notion of *mare closum* or the Papal ability to place restrictions on sea trade and travel, which had a number or radical ramifications. He secularized and opened up the ocean.[13]

But of course at the end of the day his book was indeed on the right to seize goods from other ships, which highlights the main concern of sea travel: to trade afar, and to guard fisheries close to home. Grotius saw the sea as akin to air, altogether of a different material from the land. Air, like the sea, was "public," common to all people and nations:

> The air belongs to this class of things for two reasons. First, it is not susceptible of occupation; and second its common use is destined for all men. For the same reasons the sea is common to all, because it is so limitless that it cannot become a possession of any one … Now, the same right which applies to the sea applies also to the things which the sea has carried away from other uses and made its own, such for example as the sands of the sea, of which the portion adjoining the land is called the coast or shore. Cicero therefore argues correctly: "What is so common as the sea for those who are being tossed upon it, the shore for those who have been cast thereon." Vergil also says that the air, the sea, and the shore are open to all men.[14]



Fig. 3. Plate from William Blake, *America: A Prophecy*, first printed 1793. Source: Fitzwilliam Museum.

The sea is not an extension of the land's jurisdiction from this point of view; rather, it is made of a different, more ethery substance that resists ownership. In its state of flux turning from land to sea, the shore is also of the same material—a floating composite.

The legal demarcation of the width of the ocean was what Pardo sought to augment and amend in his advocacy of the fair distribution of resources at its bottom. Pardo also calls attention to how the interest in the bottom of the sea began with the laying down of the first transatlantic cable in 1858, which provided the impetus and funding for the HMS *Challenger* to set out to systematically study the depths of the ocean. During its three-and-a-half-year journey across the world the ship stopped every hundred miles, taking samples of water, dredging the sea floor, measuring the temperature and depth, and collecting over its journey over 13,000 specimens. The depth of the ocean was measured by "soundings," where a weighted line was dropped to the bottom of the sea.

What churns both ships together across time—the *Santa Caterina* and the HMS *Challenger*—is what Hugo Grotius would call prize and booty,

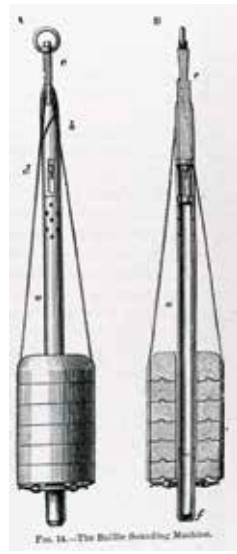


Fig. 4. The Baillie Sounding Machine. Source: Sir C. Wyville Thomson, *The Voyage of the CHALLENGER—The Atlantic*, vol. 1 (1878), 61. Archival Photography by Steve Nicklas, NOS. NGS.

or the riches of the sea and on the sea. The churning which is seismic, comes from when Booty Boots Back, or the resistance of a certain kind of property that has formed the core of my treatise: a form of resistance which plays out on the sea floor from the shores that Grotius likens to air and the sea.

Whose song musics this movement? Pardo speaks, the sonar bleeps, and the *Challenger*'s sounding takes a measure of the sea's floor. But there is more than that—the sound of something seismic afoot, the sound of the ground shaking below the ocean's waves. This is what William Blake is referring to when he speaks of mountains shaking around the Atlantic in *America: a Prophesy*, his treatise on slavery and the wars of revolution which he composed in 1793, the same year that the British attempted to quell Toussaint L'Ouverture and the revolution in Dominica. Peter Linebaugh evokes Blake to speak of changes: revolution as an earthquake and tsunami, "profound and hemispheric events that originate beneath the surface of things and which are not confined to any particular nation but arise from all four corners of the Atlantic—North and South America, Europe, and Africa."[15]

The reverberations of these revolutions on all sides of the Atlantic form the tsunami that Blake gives a poignant name to. This is at the heart of the plunder and booty whose dominion Grotius is laying the ground for that shake up and scatter the magical fragments on the ocean floor.

This is a soundtrack of flux—the dissolution of boundaries between air, sea, and human; between past and present; between social and natural forces; between earthquakes and revolution—where Pardo's balance of a future both dystopic and full of possibility is the spatio-temporal gambit of Drexciya, and its afterlife is our present moment.

Many ideas for this project came out of great conversations with Mick Taussig and a particularly excellent exchange with Corey Malcom.

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Extraterritorial Images: The Media Battle of the *Mavi Marmara*

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Introduction

In the small hours of May 31, 2010, in the extraterritorial waters of the southeastern Mediterranean, a large force of Israeli military commandos were preparing to raid a group of six boats sailing together as the Gaza Freedom Flotilla. Carrying food, medical supplies, and hundreds of international activists, the flotilla declared that it had two aims: delivering humanitarian aid to the people of Gaza besieged by Israel, and protesting Israel's stranglehold over the territory. Once Israel had decided to raid the flotilla, a confrontation between the activists and the military was all but inevitable. Few expected, however, that the ensuing skirmish would devolve into a lethal clash that would leave nine Turkish activists dead and many more on both sides wounded, among them nine soldiers.[1]

Though the physical raid on the flotilla began at around five a.m. on May 31, the takeover effort had already been launched during the preceding evening, when Israeli forces began to interrupt satellite transmissions to and from the boats. This focus on communications was not incidental. From the outset, media and publicity concerns were at the heart of the flotilla campaign, and thus of the Israeli effort to forestall it. Eager to publicize the event, the flotilla organizers had invested in live broadcast infrastructure and had journalists and broadcasters on board the vessels. In addition, many of the individual activists brought video equipment with them and were ready to document the event.

As soon as the violence erupted, images of the confrontation began to reach viewers worldwide, and more images circulated in the media in the subsequent days, weeks, and months. In fact, much of the violence on board seems to have been shaped by the adversaries' media concerns and publicity goals. Since the flotilla's organizers planned the event as a live performance of sorts, some of the violence took place in the context of their attempts to defend the communications and transmissions equipment on board the boats. The military, for its part, made an effort to document the event for its own propagandist purposes, striving to become the director, sole editor, distributor, and archivist of the resulting material.

The battle over the images was not limited to their production, but also encompassed their circulation and interpretation. The Israeli troops who raided the *Mavi Marmara* strove to locate and confiscate any footage shot by the activists almost as forcefully as they struggled to apprehend the activists themselves. The result was an archive of images co-authored by both sides but under exclusive Israeli control. Over the weeks following the raid, Israel made extensive (yet no doubt selective) use of the footage shot both by the activists and its own troops in order to support its claims that the activists had initiated the onboard violence. The activists, for their part, employed what little documentation they had managed to smuggle out, as well as some of the footage later released by Israel, in support of their opposing claims.

In what follows I wish to explore the complex logic of this event, focusing on the notion of *extraterritoriality*—geographical, legal and political, but also visual—in order to reflect on efforts to control, interpret, and manipulate historical documentation. One significant insight emerging from my analysis of the incident is that the concept of extraterritoriality, which applies both to the political situation in Gaza and to the legal status of the international waters in which this incident took place, can also be usefully applied to the battle for and over the images, which raged both during and after the violent confrontation. Most importantly, I will suggest that an extraterritorial logic of representation has come to characterize the core visual documentation of the event: while the documentation exists, it has been placed out of the reach of significant legal processes and thus remains "present at a distance."

The Gaza Freedom Flotilla—Background

After two decades of Egyptian rule, the Gaza Strip came under Israeli occupation in 1967. Over the next thirty-eight years, until 2005, Israel maintained a continuous military presence in Gaza. During this time, its Palestinian residents remained stateless and without citizenship, deprived of basic civil and human rights and excluded from democratic participation. (They shared this fate with their fellow Palestinians in the West Bank ruled by Jordan, similarly captured during the Six-Day War between Israel and its neighboring Arab states.) In 2005, Israeli forces withdrew from the Gaza Strip and civilian Israeli settlements in the region were evacuated. Gaza became nominally autonomous, under the jurisdiction of the Palestinian Authority. In the democratic legislative elections held in Gaza the following year, the Islamic party Hamas came to power, first forming a coalition with, then replacing, the secular and politically more moderate Fatah.

In real terms, however, Gaza has remained very much under Israeli control throughout the post-2005 period. Most importantly, Israel (with Egyptian collaboration) continues to control all land, naval, and aerial pathways to and from Gaza. In 2007, Israel imposed a blockade on the Gaza Strip, severely limiting the movement of goods into the region. Israel has invoked security concerns to justify the blockade; however, many

believe that it is largely motivated by political goals, collectively (and illegally) punishing the people of Gaza for having elected Hamas. Moreover, it has been claimed that one of the aims of the closure was to drive a wedge between Gaza and the West Bank, in order to weaken the already-feeble Palestinian Authority, and harm the prospect of further Israeli compromises in the West Bank.[2]

It is against this background that the Gaza Freedom Flotilla set sail in 2010. The convoy was organized by the Foundation for Human Rights, Freedom and Humanitarian Relief (IHH), based in Turkey, in collaboration with the Free Gaza Movement and other NGOs and activist networks. Three of the vessels, including the *Mavi Marmara*, left Turkey in late May 2010. The organizers' professed aims included bringing humanitarian aid to a Gazan population suffering from severe rationing of food, medical products, and other basic necessities. No less important, however, was the evident goal of raising international awareness of the plight of the Gazans, protesting the violation of their basic human and civil rights, and agitating for the larger Palestinian cause.[3] It should be noted that these two sets of goals were in a certain respect at odds with each other: whereas the goal of providing aid would have promoted compromise and quiet diplomacy, the goal of protest and agitation encouraged open confrontation and the development of a high media profile.

Indeed, the flotilla has received extensive attention in the international media, becoming the subject of books, essays, movies, videos posted on YouTube, exhibitions, and even a theatrical play.[4] It has also been the subject of national and international judicial inquiries, carried out in Israel by the Eiland Committee, the Turkel Commission, and the State Comptroller; in Turkey, The Turkish National Inquiry Committee; and internationally by the United Nations Human Rights Council, the UN Secretary-General, the US Congress, the International Bureau of Humanitarian NGOs, and Friends of Charities Association. Most recently, following a request submitted by the Istanbul-based law firm Elmadag in May 2013, the International Criminal Court conducted a preliminary examination "in order to establish whether the criteria for opening an investigation are met."[5] The research presented here relies in large part on the visual and written materials submitted to and produced by the above commissions and institutions, as well as on footage taken by the Israeli military and material shot and smuggled out by the activists.

The Takeover of Images in Extraterritorial Waters

On May 30, around ten p.m., several hours before the physical takeover of the flotilla, Israeli military forces began to interrupt satellite communications to and from the flotilla vessels. The interruptions intensified later that night until a complete or near-complete blackout on communications was imposed.[6] It is particularly significant that the Israeli operation commenced with an attempt to prohibit the transmission of images from the vessels, given that the production and distribution of images were among the flotilla's central aims. The flotilla was conceived as a high-profile media event designed to take place in broad daylight and to alert the world to the crimes being committed against the Palestinians.[7] According to Gülden Sönmez, an IHH lawyer and a member of the organization's executive committee, who was aboard the *Mavi Marmara*,

> We aimed to sail from international waters to Egyptian waters, then on to Gaza [where we wanted to] deliver the aid, if possible. If Israel prevented the delivery, we would draw attention to the illegal blockade, broadcast live for a while through the media, and then return.[8]

To make broadcasting and media coverage possible, a large number of journalists and television teams were invited on board.[9] A strong infrastructure for mid-sea live broadcasting was installed, and the engineers who operated the onboard broadcast "took account of every possible situation about the system" and worked to ensure that "the course of the flotilla could be watched uninterrupted on the IHH website."[10] To prepare for the battle over images, the IHH rented two Turksat frequencies for the live broadcast, one of which—known only to the IHH, the Foreign Press Association (FPA), and Turksat itself—was meant to serve as backup in case of attempts to block the broadcast.[11] In addition, the activists brought with them an abundance of personal communications equipment. According to some estimates, the *Mavi Marmara* held 546 passengers and 29 crew members at the time of the struggle, but no less than 600 laptops, 800 video cameras, and 1,200 mobile phones.[12]

For some of the activists, it was precisely the presence of communications devices that was supposed to signal their peaceful intentions. According to activist Alexandra Lort-Phillips, "the vessels were covered with cameras to witness the voyage. I don't know what else the Freedom Flotilla could do to make sure it was clear it was a peaceful mission."[13] For the Israeli forces, however, the deactivation of just such equipment was a central goal of the raid. One of the military's primary aims was to control and limit the distribution of images—to keep the images quarantined, as it were, within carefully set borders. In addition, the Israeli military strove to take control of the production of images by gaining physical control of all communications devices and materials on board the vessels. A special military force was devoted to capturing all digital images and gaining exclusive control over their production and circulation.[14]



Fig. 1. Still from a filmed interview with Gülden Sönmez, an IHH lawyer and member of the organization's executive committee, who was aboard the *Mavi Marmara*, conducted at the IHH headquarters in Istanbul, February 22, 2013. Photo: Maayan Amir.

The first virtual encounter between the adversaries in extraterritorial waters—the first act of the Israeli

army's interception of the flotilla—probably consisted, then, in the electromagnetic waves which blocked the images transmitted from the vessels and prevented their further circulation. "For about half an hour the Israelis have been harassing us," a reporter announced in one of the last recorded transmissions from aboard the *Mavi Marmara*, referring not to any physical force directed towards the activists themselves but to the Israeli effort to interrupt transmissions.[15] Another Turkish reporter, Ayşe Sarioğlu, described the battle for control over images: "our satellite connection was frequently failing and the internet kept disconnecting. The more they jammed, the more we elevated our receivers."[16]



Fig. 2. The events leading up to and throughout the flotilla incident are recounted in the video, as presented by the team of experts led by Maj. Gen. (res.) Giora Eiland in the Israeli military's internal inquiry. This image illustrates the Israeli military electronic screening. Still from "Video Timeline of Flotilla Incident as Presented by Eiland Team of Experts (English Version)," July 13, 2010, www.idfblog.com.

The confrontation between Israeli forces and the activists was thus, in the first place, a confrontation between two spatial logics of information flow—one devoted to restricting and monitoring communications within extraterritorial waters, the other dedicated to expanding the information flow as part of the protest agenda. As the confrontation unfolded, these conflicting logics generated complex perceptions of the role played by images.

Indeed, the invisible stream of images soon became an organizing principle of the lethal fighting that took place on board. One of the activists, attorney Cihat Gökdemir, reported:

> The first two combat boats came very close […] After a few minutes a helicopter approached from the stern side to the wheelhouse deck. It created a huge wind and a lot of noise […]. I thought the helicopter was coming to break down the radio transmitter of the ship, which was on top of the wheelhouse, so I ran toward the wheelhouse deck […]. I saw a few other people climbing the stairs with me. […] The helicopter was about 9–10 meters high and it didn't have a flag, coat of arms or any such sign. It stayed up there for about a minute and then opened fire. We thought this firing too was aiming at the satellite systems. This is why people had gathered not right on top of the wheelhouse where there was an opening, but further back, near the satellite antennas. Personally I thought "if they're sending them on board, they will probably land right on top of the wheelhouse." After this first shooting some of our friends fell down, but we still thought that they were using plastic bullets; and since we had never seen plastic bullets we believed injuries from plastic bullets weren't significant, that the main target of the attack was the satellite systems.[17]

As this testimony indicates, the scenery of the battlefield was shaped in large part by the activists' goal of protecting and sustaining the flow of images. The battle over the images was entangled with the physical conflict on board to such an extent that the two became barely distinguishable, such that



Fig. 3. Still from IHH documentary recounting the incident presented by witnesses, illustrating the Israeli military electronic screening. IHH, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min., http://vimeo.com/50824956.

Interestingly, the Israeli military and the activists chose different images to represent the launching of the electronic blackout. Whereas the Israeli military clip shows an image of a boat surrounded on all sides by moving red waves, the IHH clip shows a screenshot of a cellular phone announcing reception failure. The difference indicates a certain economy of vision: whereas the military views the event from an external vantage point, the activists view it from within and individually, through the solitary signifier of the individual cellular device.

it was no longer clear to what degree military power was mediating the image stream and to what degree the images were facilitating and shaping the physical struggle. Indeed, reports about the deadly encounter portray a tangled relation between the shooting of live ammunition and the "shooting" of images. Prior to the event, some of the activists struggled with the question of whether, in the event of an attack on the flotilla, they would attempt to document the conflict or to defend the boat. Activist Ken O'Keefe, who was aboard the *Mavi Marmara*, described the dilemma:

> When I was asked, in the event of an Israeli attack on the *Mavi Marmara*, would I use the camera, or would I defend the ship? I enthusiastically committed to defense of the ship. I am a huge supporter of nonviolence. In fact I believe nonviolence should always be the first option. Nonetheless I joined the defense of the *Mavi Marmara* understanding that we may very well be compelled to use violence in self-defense.[18]

This implied distinction between filming and active fighting would soon be contested, however. Reports claimed that men were killed holding cameras, some even "using them to film the Israeli invaders when they were shot."[19] According to several eyewitness reports, the director of the ship's press room, Cevdet Kiliçlar, was last seen stepping outside to take pictures.[20] One of the testimonies quotes his last words:

> I helped others carry one of the injured down. As I was climbing up, right in front of the pressroom door I saw our martyr Cevdet Kilıçlar. Cevdet told me "brother I sent the images." I think he had managed to send some of the images/videos of the first attack via satellite or Internet—this is what he must have meant.[21]

From the Israeli testimonies, one soldier reported being badly beaten with large camera tripods.[22] Another reported being photographed and videotaped extensively while he was being beaten with batons, making him feel like he was "in the middle of a press conference."[23] The pattern repeated itself in other soldiers' testimonies.[24]

According to one activist, the injured on board the *Mavi Marmara* were evacuated only when the Israelis discovered that "satellite images of what happened on the ship [were spreading] around the world"; only then, the activist continues, did the soldiers "begin to play the role of 'the good guy' [and try] to save the lives of the wounded."[25] The Israelis, by contrast, claim that such attempts were taking place all along and only continued in a "more managed way" once the takeover was complete.[26]









Figs. 4–7. Stills taken from the IHH documentary showing a staged reenactment of the incident. IHH, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min., http://vimeo.com/50824956. Interestingly, the IHH reenactment seems to emphasize that activists who were killed during the confrontation were in fact trying to photograph the takeover operation. This can be deduced from the placing of cameras near those who play the deceased.

Around the same time, starting at 5:10 a.m., an additional Israeli force (provided by Masada, the special operations unit of the Israel Prison Service) boarded the ship. A two-step apprehension procedure was initiated, with some of the passengers being handcuffed and all of them searched for data-storage devices. Almost all of these devices—an estimated 2,600—were confiscated.[27] Thus, while the wounded were being treated and evacuated, Israeli forces were also busy confiscating memory cards, cameras, mobile phones, hard disks, videos, and diskettes held by the hundreds of flotilla passengers, and removing all recordings from the ships' security cameras. According to the Turkel Commission Report, the same helicopters that evacuated the wounded were also used to transport some of the confiscated media for use by the Israeli Defense Force (IDF) Spokesperson and Advocacy Department. All other materials were transferred to the IDF Document and Technological Capture Collection Unit upon the flotilla's arrival at Ashdod Port.[28]

In fact, it seems that the Israeli military's censorship policy only escalated during and immediately following the confrontation itself. Prior to the raid, the Israeli military invited a group of journalists to accompany its forces. However, in the course of the raid, it prevented them from broadcasting and publishing their reports. (Incidentally, this censorship effort was self-defeating, given Israel's primary goal of preventing images of the event from circulating internationally: during the first twelve hours after the raid was launched, some images—those streamed by the activists—were distributed extensively in the international media, whereas Israeli viewers were kept in the dark.)[29]

Israel's censorship efforts did not prevent the events from being documented, but did prevent public access to this documentation. What happened on the upper deck, where the fighting took place, was filmed from numerous angles by dozens of cameras (video, still, CCTV, aerial)[30] as well as by special cameras mounted on soldiers' helmets.[31] This proliferation of cameras turned hyper-representation into a core feature and objective of the event. And yet, despite the surfeit of visual evidence produced, accessible video evidence of the confrontation remains limited to less than five minutes of material. The remaining several hundred hours of recordings are now categorized as classified information[32] for reasons of national security and remain under exclusive Israeli control.[33]

The cameras on the ship, some of them smashed by the soldiers, became unusable.[34] While passengers were detained only temporarily, images were seized permanently. As a result, the international judicial inquiry into the events had to rely on Israeli and Turkish investigative and forensic reports. In the absence of documentation, the UN report relied on a comparison between the two narratives presented by the adversaries: visual evidence—existent but inaccessible—had to be replaced with verbal testimony.

When the Images Reached Territorial Soil

By blocking electronic communications and confiscating the activists' collective digital memory, the Israeli military turned all visual evidence from the event into national Israeli property. Its goal was to ensure that all such evidence would remain "extraterritorial"—that is, kept outside of the public domain and beyond the reach of international legal proceedings. The evidence exists yet remains inaccessible to investigation by international bodies and by countries other than Israel.[35]

What little accessible footage remains shows only fragments of the actual struggle on board the *Mavi Marmara*. The publicly available evidence, most of which was released by the Israeli military, has been the visual basis for the various attempts to "expose the truth"—by governments, NGOs, the media, and individuals. Moreover, this material has served as actual evidence in various official inquiries and investigations. As noted, however, the publicly available footage amounts to no more than a few minutes of videotaped material. Rather than revealing what actually happened, it is an almost ephemeral trace of the event, testifying from a distance, as it were, to the existence of the censored footage.[36]

Since the publicly available images are both scant and susceptible to multiple interpretations, they have been used by the various adversarial parties to support different, often contrary political narratives. Paradoxically, it is precisely the absence of visual material that has allowed what little footage remains to generate a politics of persistent investigation and an aesthetics of interpretation in which the same visual facts form the basis of rival arguments.[37]

There is a complex set of relationships between the publicly available images and the functions they have been assigned within the various narratives adjoined to them. In some cases, these uses simply underscore the relationship's fundamental dependence on perspective; in others, however, the distance between image and narrative becomes so great as to make the relationship either weak or downright contradictory.

The video footage publicly available at present consists of three types of material:

1. The final images broadcast live from the ship by the activists at the time of the confrontation. These images were transmitted using the complementary Turksat satellite frequency installed by the flotilla organizers, which reportedly continued broadcasting until 7 a.m. on May 31.
2. Clips edited by the IDF Spokesperson and Advocacy Department and released about twelve hours after the event. These clips are based on footage filmed by the Israeli military as well as on materials confiscated from the activists, and were evidently edited to serve Israel's propaganda purposes.[38] One of these clips, released by the Israeli military at a later time, is "based on findings by the Eiland Team of Experts" and "breaks down the events of the flotilla using a timeline that alternates between 3D models and footage captured throughout the incident."[39]
3. A very small number of images smuggled out by the activists and released after the event.

In what follows I will look at each group of images in turn. My aim is not to try to reconstruct the events in the order they occurred (most of the visuals were released by the army, and to form a view of the event based on this partial and, in all likelihood, tendentiously chosen selection would amount to being manipulated by the military and playing by its self-serving rules). Rather, I will explore, first, the uses to which both sides have put the few publicly available images, and, second, the relationship between these uses and the confiscated images that remain inaccessible to the public.

1. The Live Broadcast

The first images from the confrontation to circulate in the media were the very last ones broadcast from the ship while satellite communications were being interrupted. These are short sequences in color, visually disrupted and distorted, which include several images of the physical altercation.[40] One short clip shows a soldier aiming his M-16 rifle horizontally and firing at an off-camera target, apparently from very close range. Another shows soldiers kicking an off-camera individual on the floor. The interruptions to the live broadcast are clearly visible in these clips, forcing viewers to observe the documented battle through the filter of the further battle between the activists' broadcasting technologies and the Israeli military's disruptive technological effort. Our view of the original event thus becomes layered or doubled, as our visual access to the violent struggle is conditioned by the lens or filter of the violent struggles between competing technologies. The violence that the image seeks to represent becomes inseparable from the violence wrought upon the image itself.

Two additional segments show a soldier being stabbed, presumably by one of the activists.[41] Though initially shown by the activists as evidence for the Israeli attack,[42] the stabbing scene was later shown by Israel's largest commercial TV channel, Channel 2, in support of the Israeli military's version of the events.[43] The scene was also edited by the Israeli military in the "timeline" clip in order to highlight the activists' alleged violence.[44] As these details indicate, the images were sometimes used in conflicting ways by the opposing sides, and were sometimes put to contradictory uses even within the same agenda. Some activists used the images in ways that contradicted the verbal testimonies of other activists. For example, the clip which shows soldiers kicking and shooting was used to expose Israeli military brutality: by superimposing heavy graphics over the moving images, the activists tried

to establish that the clip depicted the close-range execution of one of the slain flotilla passengers, Furkan Doğan.[45] The indictment submitted to the criminal court in Istanbul, however, in making the charge that the Israeli military attacked before encountering any violence, claimed that "Furkan Doğan and İbrahim Bilgen were killed before any of the soldiers boarded the ship *Mavi Marmara*."[46]

2. Clips Released by the Israeli Military

The materials provided by the Israeli military are intriguing in a number of ways. Rather than describing all the material released, I will concentrate here on a piece of footage which underscores the problems of evidence and interpretation described above.

In one piece of footage—a minute-long clip, which is in color but without sound, taken in long shot from aboard the ship—a Morena-type Israeli military vessel is seen approaching the *Mavi Marmara*. Passengers aboard the *Marmara* are seen wielding clubs and waving a chain, throwing objects, and using a water hose to spray Israeli soldiers located below them on a Zodiac boat. At the same time, a flicker of light can be seen flashing.

On the IDF website, this clip is described as evidence that the activists assaulted the soldiers. Using instructive graphics overlaid on top of the footage, the Israeli military claims that the flashing (presumably exploding) object was a stun grenade thrown at the soldiers.[47] However, this claim contradicts the testimony of "the most senior [Israeli military] officer in charge of taking the *Mavi Marmara*" that he himself had ordered the use of flash grenades (a type of stun grenade that creates both noise and temporarily blinding flashes) as soon as the Israeli military Morena boats met with resistance.[48]

Parts of the same clip from the IDF website also appear in a documentary produced by the IHH which aims to reconstruct the events based on eyewitness testimony.[49] Here the footage is presented as evidence that the activists tried to prevent the soldiers from boarding the ship, yet the documentary claims that it was the soldiers who threw grenades from the Zodiac boats onto the *Mavi Marmara*.[50]

The "timeline" clip put together by the Israeli military incorporates much of the same footage described above. The clip is heavily edited and accompanied by a narration presenting the Israeli version of the event. This representation also draws from a clip that features some of the footage described earlier, but other materials are otherwise unavailable to the public, including footage in which Israeli military boats are seen approaching the *Mavi Marmara* and being sprayed by water hoses, and aerial footage in which a soldier is seen sliding down a rope and being attacked by group of people holding clubs, while another is being thrown to a lower deck. The last segment also appears in the IHH documentary, where it is used to illustrate



Fig. 8. Still from Iara Lee, dir., "Israeli Attack on the Mavi Marmara // Raw Footage," June 11, 2010, http://youtu.be/vwsMJmvS0AY. (CulturesOfResistance.org)

the activists' claim that the soldiers had begun shooting from the helicopters before any of them started sliding down the ropes.[51] Interestingly, at a later point, the documentary shows sections from these clips as an activist describes how he, together with others, managed to "throw some of the soldiers overboard to prevent them from shooting" and how "some of [the soldiers] may have jumped by themselves to avoid falling into our hands."[52]

3. Smuggled Images

The main piece of video footage smuggled from the *Mavi Marmara* was filmed by activist Iara Lee, who managed to hide her camera's memory card despite the Israeli military's confiscation efforts.[53] Her footage testifies visually to the complexity of the act of visual documentation itself on board the ship. The footage shows very little of the actual physical confrontation.[54] Israeli military Zodiac boats are shown approaching the *Mavi Marmara*; gunshots are heard,[55] and a soldier is seen pointing his gun upwards and shooting; several objects are thrown at the soldiers, including a large case, and a flickering light flashes quickly while another loud noise is heard. Many of the passengers are seen holding metal clubs and poles, and there are shots depicting red stains.[56] Later, soldiers are seen descending onto the ship from a helicopter while three activists aim slingshots and shoot at the helicopter. Towards the end of the recording, just before the takeover is complete, a group of activists holding metal poles is seen crowding the stairwell leading to the ship's entrance and protecting the door from inside. Gunshots are occasionally heard, probably coming from outside (off-camera). One activist is shown standing near the round window of the already-smashed entrance door, and as what sounds like a gunshot is heard, the man is seen either ducking or falling down.[57] As noted, however, the actual confrontation is hardly seen. Most of the footage shows the evacuation of the injured to the ship's inner galleries, and various attempts to provide medical care.[58]

Iara Lee's footage reveals the prominent presence of photographers, both amateur and professional, aboard the ship. From the beginning of the interception, barely a sequence goes by without a photographer being caught in the frame. As a result, we, the viewers, cannot but reflect on the ways in which the event we observe was documented; our experience of the event is always mediated by our contemplation of the photographers' work. Whereas in the beginning of Lee's footage the photographers seem to apply routine documentary conventions in taking photos of the wounded from the sidelines or looking down from above, once the capture is in full effect they can no longer be separated from their

subjects. In many cases, those taking pictures of the wounded from close range are forced to stop in order to make way for evacuators and medical help. Photographers are seen documenting their own colleagues while they themselves are looking for shelter. The unity of photographer and subject culminates in a piece of footage in which a photographer is seen turning his camera towards himself in extreme close-up in order to document himself lying down wounded.

The army's eventual confiscation of the footage changed the photographers' role, however, from being the producers of actual (that is, viewable) documentation to the manufacturers of merely symbolic meaning. With most of the documentary footage confiscated and archived away from public view, the photographers' own presence in the available footage becomes mere testimony to the plethora of missing images.[59]

Extraterritoriality and the Battle over the Images

This essay has focused on a central feature of the military interception of the flotilla, namely, the Israeli military's takeover of images of the event. Israel's state archives contain visual evidence that may determine whether violations of human rights occurred; yet for alleged reasons of national security, this evidence remains beyond the reach of international law and of states other than Israel. This state of affairs, in which the evidence is, paradoxically, "present at a distance," generates instability and contributes to the indefinite suspension of the event's legal and political resolution.

More generally, my project suggests that the Gaza flotilla raid could serve as a case study illustrating a specific economy of vision. The military sees and interprets particular images, and imposes a taboo on their public representation, claiming that their invisibility is vital to national security. Thus, the state produces digital archives of violence whose contents are co-authored by its own military and by activists, archives which remain out of reach, even—indeed, precisely—in cases where human rights may have been violated.

The coauthorship of the contents of these archives is a remarkable feature in itself, in its combination of representations produced by the military, acting in the name of the law, with those of the activists, staging a spectacle to challenge the law yet being obliged to do so in terms defined by that same law. As soon as the images authored by the activists are expropriated, the coauthored archive comes to occupy a space between documented history (which may be used to incriminate its civilian coauthors) and an inaccessible visual inventory.

Another significant and related feature of the coauthored archive has to do with the question of postproduction and intellectual property. Though the archive is coauthored, one of its authors, the state, becomes its exclusive archivist and sole legal proprietor. Its other authors are excluded from the archive and may even be incriminated by the fruits of their own labor. Moreover, with the images having become spoils of war, their status seems to have changed from that of important historical documentation—important enough to have governed the character of the confrontation and the precise way in which it unfolded—to that of mere illustrations of various political claims. Their ability to convey information, to impart genuine knowledge, became dubitable. The primary question regarding these materials was no longer "What do I see?" but "How can this image help me establish the story I wish to tell?"

Given these general features of the flotilla incident, I wish to suggest that the incident and its aftermath may be best understood through the notion of *extraterritoriality*, which seems to have shaped not only the event's *legal* dimensions (including the legal aspects of its concrete spatial geography) but also its *visual documentation*. The notion of extraterritoriality is expressed here in at least four distinct ways.

Firstly, and most obviously, since the raid took place in extraterritorial waters, the notion of extraterritoriality shaped and governed the Israeli exercise of legal and physical power throughout the incident. Israel's blockade forced the activists to stage their action in the high seas, and this, in turn, led to Israel's extension of its power to extraterritorial waters, an area beyond its own legal jurisdiction.

Secondly, the notion of extraterritoriality was central to the aims and motivations of the flotilla organizers. They claim that Israel's effective control over Gaza and its regulation of the passage of goods and persons through Gaza's borders constitutes an illegal expansion of Israel's state powers beyond their proper jurisdiction.[60] The logic of Israel's control over Gaza has become especially convoluted since the so-called "disengagement" campaign of 2005, during which Israel unilaterally withdrew its military forces and civilian settlements from the Gaza Strip, yet maintained complete control of the region's borders, coastline, and airspace. Since then, Gaza's territory has come to be defined by a series of Israeli actions and proclamations intended to isolate it from its immediate geographical environment as well as from the other Palestinian territories in the West Bank. During this period, the Israeli authorities have declared Gaza a "hostile zone" (2007), a "combat zone" (2008), and, during Operation Cast Lead, a "military enclosure" and "exclusion zone" (2009).[61] Gaza's territoriality has thus come to be defined by the various exclusions and blockades to which it has been subjected.

Thirdly, by confiscating images documenting the event, the Israeli military created an archive of visual documents that is "extraterritorial," in the sense of being outside of the public eye and beyond the reach of international and national legal mechanisms. In many cases, both the activists and the Israeli government defended their actions by citing images Israel has not been willing to release. In such cases, the documentation has remained "present at a distance," publicly invoked in the service of certain political purposes, yet relegated to an "extraterritoriality" in which the normal workings of the legal and political order are suspended.

Examples of similar images used by both the activists and the Israeli military to convey contradictory meanings



Fig. 9. Still from Israeli military, "Flotilla Rioters Prepare Rods, Slingshots, Broken Bottles and Metal Objects to Attack IDF Soldiers," June 2, 2010, http://youtu.be/HZISSaPT_OU. Parts of this clip appear in the IHH documentary, which was edited and combined with testimonies of the activists to illustrate their narratives regarding the way they prevented the soldiers from boarding the ship, and their endeavors to protect it.



Fig. 10. Still from IHH, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min. An activist testifies: "When the soldiers tried to board the ship by dropping rope ladders... the men were trying to push them back with water pressure."



Fig. 11. Still from Israeli military clip, "Mavi Marmara Passengers Attack IDF before Soldiers Boarded Ship," "Activist waving metal bars later used for hitting soldiers," June 2, 2010, http://youtu.be/B6sAEYpHF24. Part of this segment appears in the documentary produced by the IHH to illustrate the attempts at preventing the soldiers from boarding the ship. Yet earlier in the movie, activists claim that at that stage the soldiers were throwing the grenades from the zodiacs at the Mavi Marmara.



Fig. 12. Still from IHH, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min.



Fig. 13. Still from the Israeli military, "Habat—Unit of education and training, produced by technological means." Based on findings by the Eiland Team of Experts, the film "presents the incident" by breaking down the flotilla events and using a timeline that alternates between 3D models and footage captured throughout the incident." Voiceover: "While falling one of the soldiers is stabbed in the stomach and hand." "Timeline of the Mavi Marmara Incident (English, High Quality Version)," May 22, 2011, http://youtu.be/z31GesVrBjc.



Fig. 14. Still from the IHH documentary, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min. An activist testifies: "Of course at first we were able to throw two to three soldiers to the lower deck by such prevention. [...] Some of them might have jumped by themselves not to fall into our hands."



Fig. 15. Still from the IDF, "Habat—Unit of education and training, produced by technological means." Voiceover: "As soon as the IDF light boats approached the boat, IHH activists crowded together at the side of the ship." "Timeline of the Mavi Marmara Incident (English, High Quality Version)," May 22, 2011, http://youtu.be/z31GesVrBjc.



Fig. 16. Still from IHH, *Freedom: Last Destination Mavi Marmara* (Turkey, 2012), 91 min. An activist testifies: "For a moment I thought that they all came only for me."

It is worth noting that my use of "extraterritoriality" in the last two cases diverges from the term's ordinary sense, in which it refers to a condition of being beyond the reach of some legal jurisdiction. Rather, the extraterritoriality of both the archive of images and Gaza itself follows a more complex logic, one in which (1) the state exercises direct control over some object (the archive of images, Gaza's territory and population), regulating it, preventing others from having access to it, etc.; and (2) the state nevertheless does so while exempting its own actions, either partially or completely, from the scrutiny of legal mechanisms and from the public eye. In the case of the expropriated archive of images, the result is a regime of representation in which the images are removed from the public field of vision; to the extent that they remain present in the public discourse, it is only via the indirect (and unverifiable) verbal representations provided by the state at its own unregulated discretion.

The logic of extraterritorialization I have just described is hardly unique to this case. It is discernible in various other historical episodes, some more recent, some less so. One example seems especially apposite to the present discussion. The Turkish military can exempt candidates from military service (which is usually mandatory for men aged twenty to twenty-four) on the grounds of homosexuality. Recent testimonies allege, however, that to qualify for the exemption, candidates must prove their sexual orientation not only in grueling interviews but also by providing visual evidence—still photos and video footage of the candidate having sex with another man (specifically, as a "bottom"). According to testimonies (which Turkish military authorities of course deny), this demand has made the Turkish military the owner of one of the world's largest pornographic archives. Co-authored in effect by the military and by the individuals who file for the exemption, this archive, however, is accessible to military authorities alone and not to ordinary citizens.[62] It is thus partly a repository of documented history, partly an inaccessible inventory expropriated from the public sphere and from its civilian co-authors. At the same time, it remains present in the public sphere, if only at a distance, by virtue of its potential use to incriminate the individuals who contribute to it.

Finally, the extraterritorial logic of the flotilla event seems to have extended to the legal proceedings and tactics taken up by the flotilla organizers both before and after the Israeli takeover of the boats. Since the takeover occurred mid-sea, in extraterritorial waters, and since, paradoxically, international naval law revolves around the national affiliation of vessels,[63] the national identity of the *Mavi Marmara* has been at the center of the legal action taken by the organizers against Israel. The *Marmara*'s free-floating identity has been articulated in different ways in the various legal charges brought against Israel, depending on the particular courts or legal bodies before which the case has been brought. In this way, the *Marmara* has anchored both the flotilla organizers' claim for universal justice and the legal, diplomatic, and even cultural processes occurring at the distinctly national level.



Fig. 17. Mavi Marmara Trial, Istanbul's 7th Court of Serious Crimes in Çağlayan Courthouse (Inside the Entrance Hall), October 10, 2013. Photo: Maayan Amir.

The IHH bought the *Mavi Marmara* from the City of Istanbul.[64] Two days before setting sail, presumably for reasons of regulatory convenience, the boat gave up its official Turkish affiliation, registering instead under the flag of the Comoros Islands, a tiny archipelago in the Indian Ocean. Ironically, it was the organizers' choice of a "flag of convenience"—a step often taken to circumvent legal requirements and avoid minimal human rights standards[65]—that allowed them to press charges against Israel for the most serious crimes recognized by international law. The *Marmara*'s original Turkish affiliation was the basis for charges brought before the criminal court in Istanbul. Yet it was the boat's new national affiliation that enabled the organizers to appeal to the International Criminal Court (ICC) at The Hague. Had the *Marmara* remained a Turkish boat at the time of the takeover, the IHH could not have gone to the ICC, since Turkey (like Israel) is not a signatory of the Rome Convention and therefore not an ICC member. But due to the boat's arbitrary registration under the Comoran flag, the IHH was able to bring its charges of "crimes against humanity" before the international court.

In all of the above diverse ways, the notion of extraterritoriality helped shape the spatial, legal, and visual contours of the flotilla event. It is the extraterritorial phenomenon of "presence at a distance," I have argued, that has governed the logic of the event and its aftermath. To the extent that this phenomenon is a significant aspect of contemporary political life, the flotilla incident remains an important lens through which to decipher the current political order.

This essay is based on research conducted as part of the Exterritory Project, an art project dedicated to the practical and theoretical exploration of ideas concerning extraterritoriality in an interdisciplinary context.




Figs. 18, 19. "Activists Stage Possible Scenarios for Encounter With the IDF, Preparation toward the 2011 Flotilla." Stills from Ruti Sela & Maayan Amir, *Staying Human*, video, 2011.

1 See the Turkel Commission, *The Public Commission to Examine the Maritime Incident of 31 May 2010* (Israel, 2010), 1–36, http://www.turkel-committee.gov.il/files/wordocs/8035re port-heb.pdft, accessed July 7, 2011; The Foundation for Human Rights and Freedoms and Humanitarian Relief (IHH), Department of Research and Publication, *Mavi Marmara: Gaza Freedom Flotilla* (Istanbul, 2012), 39.

2 The report by the Turkish inquiry was published in February 2011, a month after the publication of the Israeli Turkel Commission Report, parts of which the Turkish report addresses. See Turkish National Commission of Inquiry, *Report on the Israeli Attack on the Humanitarian Aid Convoy to Gaza* (2011), 78–81, http://dosyalar.hurriyet.com.tr/mavimarmara_rapor.pdf, accessed March 10, 2012; UN Secretary-General, *Report of the UN Secretary-General's Panel of Inquiry on the 31 May 2010 Flotilla Incident* (September 2011), 16, http://www.un.org/News/dh/infocus/middle_east/Gaza_Flotilla_Panel_Report.pdf.

3 According to an IHH press release published in April 2010, titled "Coalition to Break the Blockade on Gaza Announced," one of the organizers' goals was to "use this action to wake the world's consciousness about the crimes committed against Palestinians." See IHH Department of Research and Publication, *Mavi Marmara: Gaza Freedom Flotilla* (Istanbul, 2012), 33.

4 See, for example, David Segarra, dir., *Feu sur le Marmara* (Venezuela, 2010), 70 min.; Press TV, *Mavi Marmara: The Inside Story* (Iran, 2011), 50 min. The IHH produced an exhibition, "Mavi Marmara Art Exhibition" (opening in August 2010). Sedat Doyan's play *Ölüyoruz, Demek ki Yaşanılacak* (Dying to Give Life), directed by Bedir Avşin, premiered in November 2011, in Qatar.

5 International Criminal Court, "ICC Prosecutor receives referral by the authorities of the Union of the Comoros in relation to the events of May 2010 on the vessel 'MAVI MARMARA'," May 14, 2013, http://www.icc-cpi.int.

6 Regarding the exact timing of the blackout, see Turkel Commission Report, 138; Turkish National Commission of Inquiry Report, 20; International Bureau of Humanitarian NGOs (IBH) and Friends of Charities Association (FOCA), *Timeline and Inconsistencies Report Relating to the Gaza-bound Freedom Flotilla Attack* (2010), at 30, http://www.foca.net/media/documents/timeline-inconsistencies-gaza-flotilla-attack-31052010.pdf, accessed January 15, 2013. According to the Turkish National Commission of Inquiry report (77–78), the Israelis decided to attack the flotilla at night precisely in order to prevent live coverage in the media.

7 See IHH, *Mavi Marmara: Gaza Freedom Flotilla*, 33, 39; Turkel Commission Report, 119.

8 Testimony of Gülden Sönmez (2012) published in IHH, *Mavi Marmara Indictment*, 10.

9 TV crews broadcasting live from the ship included TRT, TV Net, HABERTÜRK TV, Press TV, al-Hivar,Al Jazeera English, the Kuwait News Agency, Telesur & Venezüela TV, The Burunei Times, al-Aksa TV, El Cezire Arabich, and Gulf News Agency. The flotilla organizers' interest in media coverage was reflected in their investment in social media. According to Adi Kunstman and Rebecca Stein, "from its inception, the journey of the Freedom Flotilla was a social media event. The organizers used social media extensively: tweeting updates from the boats; webcasting live with cameras uplinked to the Internet and a satellite, enabling simultaneous rebroadcasting; employing Facebook, Flickr, YouTube and other social networking websites to allow interested parties to see and hear them in real time; and using Google Maps to chart their location at sea. […] A quarter of a million people watched its video feed on Livestream alone, while many more consumed these images in abbreviated form on television news." Adi Kunstman and Rebecca L. Stein, "Another War Zone: Social Media in the Israeli-Palestinian Conflict," *Middle East Report Online* (MERIP), September 2010, http://www.merip.org/mero/interventions/another-war-zone#.UBFoyo1TSiE.email.

10 IHH, *Mavi Marmara: Gaza Freedom Flotilla*, 25.

11 Ibid.

12 Turkel Commission Report, 15–16. See also Lauren Booth, "Gilad Atzmon: Shocking Testimonies from the Mavi Marmara Survivors and One Israeli Fembot," June 13, 2010, http://mycatbirdseat.com/2010/06/gilad-atzmon-shocking-testimonials-from-the-mavi-marmara-survivors-and-one-israeli-fembot-by-lauren-booth/.

13 "Trial of Israeli Generals over Mavi Marmara Raid Begins," *Today's Zaman*, November 6, 2012.

14 Turkel Commission Report, 129, 176, 178.

15 *Freedom: Last Destination Mavi Marmara*, IHH documentary film (Turkey, 2012), 91 min., http://vimeo.com/50824956.

16 Zahide Tuba Kor, ed., *Witnesses of the Freedom Flotilla: Interviews with Passengers* (Istanbul: IHH Kitap, 2011), 69.

17 IHH, *Mavi Marmara Indictment*, 4–5. Gökdemir is director of the human rights NGO Mazlumder and attorney at the Elmadağ Hukuk law firm which represents the IHH. He is a signatory of the firm's referral to the International Criminal Court accusing the Israeli military of war crimes and crimes against humanity. See International Criminal Court, "ICC Prosecutor Receives Referral."

18 Bayoumi, ed., *Midnight on the Mavi Marmara*, 37. A slightly different version of this testimony appears in a BBC documentary, where O'Keefe states: "I was given the opportunity to either be a part of filming or witnessing or defending the ship and I made a decision to defend it." "Death in the Med," Panorama, BBC, 30 min., August 22, 2010.

19 Philip Weiss, "UN: Two Men Killed on 'Mavi Marmara' were Holding Cameras When They Were Shot," *Mondoweiss*, September 25, 2010, http://mondoweiss.net/2010/09/un-two-men-killed-on-mavi-marmara-were-holding-cameras-when-they-were-shot.html

20 "He was shot while he was taking a photo, at the moment when his camera […] flashed. He was shot in his forehead." International Criminal Court, "ICC Prosecutor Receives Referral," 12.

21 Testimony of Cihat Gokdemir, IHH, *Mavi Marmara Indictment* (2012), 7–8.

22 As one soldier testified: "I was surrounded by six people and another person who arrived a few seconds later. This person had a large camera tripod in his hand; he joined the terrorists and beat me with the tripod. My situation at that point was that I was surrounded by terrorists." Turkel Commission Report, 155.

23 Ibid., 158.

24 Ibid., 160, 162.

25 Kor, *Witnesses of the Freedom Flotilla*, 162.

26 Ibid., 146; and Turkel Commission Report, 173–74.

27 See Booth, "Shocking Testimonies from the Mavi Marmara."

28 Turkel Commission Report, 178 note 605.

29 This fact was highly criticized in the Israeli State Comptroller's Report (112, 114), and in the Israeli Parliament: see Knesset State Control Committee, Protocol no. 263, June 14, 2012, http://www.knesset.gov.il/protocols/data/rtf/bikoret/2012-06-14.rtf.

30 Several activists claim to have filmed the entire attack. See Kor, *Witnesses of the Freedom Flotilla*, 77, 81.

31 Turkel Commission Report, note 421.

32 Ibid., 11, 23.

33 The Israeli Law of Freedom of Information (1988) permits withholding information for reasons of national security: see http://www.knesset.gov.il/laws/special/heb/freedom_info.htm, accessed September 21, 2012. On the IDF Spokesperson's use of national security reasoning, see the Promised Land Blog, "IDF spokesman Spins Mavi Marmara Video for Local Political Purposes," August 13, 2010, http://www.promisedlandblog.com/?tag=mavi-marmara.

34 Kor, *Witnesses of the Freedom Flotilla*, 212.

35 The fact that the confiscated materials constitute crucial evidence is emphasized in the Turkish National Commission of Inquiry Report, 5. The importance of free access to the documentary footage was stressed in the United Nations Human Rights Council, *Report of the International Fact-Finding Mission to Investigate Violations of International Law, including International Humanitarian and Human Rights Law, Resulting from the Israeli Attacks on the Flotilla of Ships Carrying Humanitarian Assistance,* September 27, 2010, at 4, 58, http://www2.ohchr.org/english/bodies/hrcouncil/docs/15session/A.HRC.15.21_en.PDF.

36 The Turkel Commission describes reviewing hundreds of hours of audio and video footage of the forty-minute skirmish, representing multiple sources and perspectives (11).

37 Presumably, the unreleased visual material can resolve some of the factually disputed issues, though probably not all the associated moral and political controversies.

38 See Turkel Commission Report, 178 note 605, in which an Israeli military official is quoted as saying that some of the magnetic media gathered on the ship was "transferred to Israel by helicopter to be used by the IDF Spokesperson and Advocacy Department." Some have claimed that certain materials released by the Israeli military are inauthentic. See IBH/FOCA, *Timeline and Inconsistencies Report*, 95–97.

39 "Timeline of the Mavi Marmara Incident," May 22, 2011, http://youtu.be/z31GesVrBjc.

40 These include live broadcasts by news reporter Jamal al-Shayal of Al Jazeera English, "Israeli troops storm Gaza flotilla," May 31, 2010, http://youtu.be/xFEBbDkyrqQ. See also IHH, *Freedom: Last Destination Mavi Marmara.* The IHH pre-installed two Turksat frequencies in case the Israeli military jammed communications, yet few of the activists knew how to run and manage the additional frequency. See IHH, *Mavi Marmara: Gaza Freedom Flotilla*, 25.

41 "Dakika, dakika, Mavi Marmara_ya saldiri," CNN TURK, June 1, 2010,http://youtu.be/INVT98698R8.

42 Ibid. See also "MGF – Milli Görüş Forum – İHH.flv," May 30, 2010, http://youtu.be/bfFfK4CxUHM.

43 "'Peace activists' stabbing Israeli soldier," Channel 2, Israel and DHA, May 31, 2010, http://youtu.be /buzOWKxN2co.

44 "The flotilla ship Mavi Marmara, peace activist stabbing IDF soldier" (2011), http://youtu.be/o6MLJErSD2s, accessed March 24, 2012; "Timeline of the Mavi Marmara Incident."

45 "Mavi Marmara Truth: İsraeli soldiers killing Furkan (The Freedom Flotilla)," June 9, 2010, http://youtu.be/rdA6jJ8dOZQ.

46 Chief Public Prosecutor's Office, Indictment File (2012), 38. See also UN Secretary-General, *Flotilla Incident*, 59; and "Mavi Marmara Truth."

47 "Mavi Marmara passengers attack IDF before soldiers board ship," June 2, 2010, http://youtu.be/B6sAEYpHF24.

48 Turkel Commission Report, 143.

49 IHH, *Freedom: Last Destination Mavi Marmara*.

50 Ibid.

51 Ibid., 33:15–33:16. An audio clip released by the Israeli military purportedly documents a radio exchange in which the army addressed the flotilla ships with the request to change route prior to the takeover. Also heard in the clip is a series of responses which, according to the Israeli military, originated from the flotilla boats, including, "Shut up, Israeli navy, shut up!," "Shut up, go back to Auschwitz," and "We're helping Arabs to go and get the US, don't forget 9/11, guys!" The alleged responses drew controversy when bloggers such as Max Blumenthal disputed their authenticity. See Max Blumenthal, "Israeli army admits it doctored Gaza freedom flotilla audio clip," Global Research, June 10, 2010, http://www.globalresearch.ca/israel-military-admits-it-doctored-gaza-freedom-flotilla-audio-clip/19646.

52 IHH, *Freedom: Last Destination Mavi Marmara*, 33:15–33:16 min.

53 See Kor, *Witnesses of the Freedom Flotilla*, 63.

54 See "Israeli Attack on the Mavi Marmara/Raw Footage," June 11, 2010, http://youtu.be/vwsMJmvSoAY (especially 37:06–44:00); and Iara Lee, dir., *Cultures of Resistance* (USA, 2010), 73 min.

55 Against the backdrop of the Israeli claim to have used paintball guns at this stage of the interception, it is important to note that for the ordinary, untrained ear it is not possible to make out the sound of actual gunshots. Turkel Commission Report, 143.

56 Lee, *Cultures of Resistance*, 38:26–39:06. The footage shows an onboard exchange in which a passenger holding a camera claims that the red stains are actually paint. Pertinent to this is the Israeli military's decision to use red paintballs. Whether the stains were blood or not remains unclear. The Turkel Commission Report takes special note of the army's problematic choice of color, stating that it was exploited by "advocates" as "evidence that IDF soldiers used excessive force, when, in fact, just the opposite was the case" (259).

57 See "Israeli Attack on the Mavi Marmara/Raw Footage," 35:53–36:56, 41:30–42:44, 50:29–53:00.

58 For still images from the ship see Robert Mackey, "Photographs of Battered Israeli Commandos Show New Side of Raid," The Lede Blog, *New York Times*, June 7, 2010, http://thelede.blogs.nytimes.com/2010/06/07/photographs-of-battered-israeli-commandos-show-new-side- of-raid/. See also Meagan Perry, "Kevin Neish's photos of Mavi Marmara Attack Published Plus Full Interview," rabble.ca, June 9, 2010, http://rabble.ca/news/2010/06/do-not-publish-yet-kevin-neishs-photos-mavi-maramara- attack-published. In the media, the same still images were often used in support of conflicting claims, though in contrast to the use of video footage, this was usually facilitated by deceptive efforts to manipulate the contents of the images, for instance by cropping. See Ed Barnes, "Reuters Admits Cropping Photos of Ship Clash, Denies Political Motive," Fox News, June 8, 2010, http://www.foxnews.com/world/2010/06/08/reuters-fake-photos-ihh-gaza -blockade-commandos.

59 See "Israeli Attack on the Mavi Marmara/Raw Footage," 59:49–59:52, 1:02:10–1:02:13.

60 In 2009, Gaza was not yet officially recognized as a "non-member observer State"; this status was granted by the UN in 2012 by G.A. Res. 67/19, U.N. Doc. GA/11317 (November 29, 2012). For the Turkish claim that Israel holds effective control over Gaza, see Turkish National Commission of Inquiry Report, 82.

61 See Turkel Commission Report, 30, 35, 36; Turkish National Commission of Inquiry Report, 75.

62 See "Want to avoid Turkey's military draft? Gay? You'll need video or photographic proof," LGBT Asylum News, November 26, 2012, http://madikazemi.blogspot.co.il/2010/11/want-to-avoid-turkeys-military-draft.html; and "Certificatul Roz—BBC—The Pink Certificate—Partea," BBC, April 19, 2012, http://youtu.be/cMwUl7U_mpk.

63 Tina Shaughnessy & Ellen Tobin, "Flags of Convenience: Freedom and Insecurity on the High Seas," *Journal of International Law & Policy,* vol. 5 (2006–2007).

64 "Turkish Rights Group's Cargo Ship to Set Sail with Gaza Aid," *Hürriyet Daily News*, April 13, 2010. See also IHH Humanitarian Relief Foundation, "Ship Purchased for Gaza Campaign," March 29, 2010, http://mavi-marmara.ihh.org.tr/en/main/news/0/ship-purchased-for-gaza-campaign/231.

65 International Transport Workers Federation, "What Are Flags of Convenience?," http://www.itfglobal.org/flags-convenience/sub-page.cfm, accessed June 1, 2013.

Lexicon

Unless otherwise indicated, the following summaries of key terms and concepts were suggested by contributors to *Forensis*.

0

5TH GENEVA CONVENTION
The transformation of the environment, whether through construction or destruction, has always been part of human conflict. What has changed since the invention of atmospheric warfare in the early twentieth century is the capacity to mobilize the environment as both a medium and an agent of violence. In the aftermath of the ecological devastation of the Gulf War, activists and scholars convened a 5th Geneva Convention to call for legal protection of the environment in times of armed conflict. Existing mechanisms only offered protection to the environment in as far as the environment would be implicated in human loss, thus failing to effectively secure the protection of ecological systems per se. The increasing legislation of the environment does not mean that nature is being pushed outside spaces of conflict, but precisely the opposite. The inscription of the environment into the codes and practices of law reveals a deeper incorporation of nature into the means by which violence and rights violations take place. In the context of anthropocenic geopolitical conflicts, intersections between contemporary military, humanitarian, legal, and scientific practices raised by the 5th Geneva Convention are more pertinent than ever.

A

ANIMISM
Animism has continued to pose a serious riddle to Western epistemologies. While the evocation of life is a well-known effect in animated cartoons and digital animations, and in more delicate ways, in painting and sculpture, outside the territory of art and mass media, animation has been a disputed problem. Far from being a matter of abstract considerations, when animation is taken outside the field of art it becomes an ontological battleground that is at the frontier of colonial modernity: in the context of contemporary politics and aesthetics, it concerns the urgent question of the transformability and negotiability of ontologies, in which claims to reality and the ordering of the social world are at stake. On this battleground, the problem of animation was given the name "animism" by nineteenth-century anthropologists aspiring to see their work incorporated into the ranks of science.

ARCHAEOLOGY OF THE PRESENT
"It is as if, speech having withdrawn from image to become founding act, the image, for its part, raised the foundations of space, the 'strata,' those silent powers of before or after speech, before or after man. The visual image becomes archaeological, stratigraphic, tectonic. Not that we are taken back to prehistory (there is an archaeology of the present), but to the deserted layers of our time which bury our phantoms; to the lacunary layers which we juxtaposed according to variable orientations and connections." (Gilles Deleuze)

AUSCULTATION
The invention of the stethoscope by René Laennec in 1816 inaugurated the practice of auscultation—listening to the inner sounds of the body—and transformed the practices of medical diagnosis. While the stethoscope symbolizes communication between doctor and patient, this entailed direct communication with the body, bypassing the subjective account of the patient. The body was accordingly conceptualized as a collection of voices, which, unlike the speech of the patient, didn't lie; it was unable to dramatize, embellish, and exaggerate the patient's condition. The stethoscope thus shifted the medical ear from listening to speech to listening to the sounds of the body itself. As a form of forensic listening, it transformed the patient's body into a hostile witness against its own speech acts, as simultaneous, not necessarily corroborative testimonies are emitted from the body and from the speaking voice.

B

BOOK OF DESTRUCTION
In the spring of 2009, the Gaza-based and Hamas-run Ministry of Public Works and Housing compiled an astounding archive containing thousands of entries, each documenting a single building that had been completely or partially destroyed, from cracked walls to houses reduced to rubble. Each entry in the Book of Destruction included a single, frontal-view photograph displaying a catalogue number spray-painted onto the ruin itself. Each file also recorded how the damage to the building was inflicted—"destroyed by armoured D9 bulldozers," "bombed from the air," "shelled from the ground," "directly targeted," "indirectly struck," or "controlled demolition by explosives"—and the state of the building—"reduced to rubble," "partially destroyed," or " still standing but dangerous and requiring demolition." In reconstructing histories of violence from the trash and rubble left behind, this archive is another instance of forensic architecture. Both practical and political, its forensics escapes, however, the limited frame of international law.

C

CONVICTION
The word *conviction* draws a line between the legal verdict of "guilty" and the subjective sensation of constructed belief.

COUNTER-FORENSICS
1. A technical term in criminology referring to efforts designed to frustrate or prevent in advance the forensic-scientific investigation of physical or digital objects, including documents and photographs as well as bodies, soil, weapons or their residues, buildings, etc. An often sophisticated operationalization of the dictum "leave no traces," counter-forensic practices seek actively to block the deposition or collection of traces and/or to erase or destroy them before they can be acquired as evidence.
2. A term coined by the photographer and writer Allan Sekula to describe the deployment of forensic techniques, derived from police methods, by human rights investigators and their colleagues (including forensic anthropologists, photographers, and psychotherapists) in order to challenge oppressive regimes or respond to their aftermath. Sekula writes, referring principally to the work of Clyde Snow and Susan Meiselas in Kurdistan after the first Gulf War: "Counter forensics, the exhumation and identification of the anonymised ('disappeared') bodies of the oppressor state's victims, becomes the key to a process of political resistance and mourning."

D

DESTRUCTION OF DESTRUCTION

The destruction of refugee camps in Palestine is sometimes referred to as "the destruction of destruction," which equates to the destruction of the destruction of Palestine. The camp is not a home; it is a temporary arrangement. Its rubble is the last iteration in an ongoing process of destruction that connects the destroyed village of 1948 to the destroyed camp of 2009, but the destruction of the latter is also interpreted as possessing a restorative potential. The twelfth-century Andalusian scholar ibn-Rushd (Averroes) penned a treatise of this very name—*Tahāfut-al-Tahāfut*—in which he refuted the refutation of classical philosophy proposed by Sufi ascetic Ghazali in his eleventh-century *Tahāfut-al-Falāsifa*. Is the refutation of the displacement, a proto-Hegelian negation of the negation, being applied here to the realm of political domesticity? Should we be packing up for return, when all we can do is to clear up the mess and rubble, recycle their component parts and start rebuilding the camp all over again? Rebuilding the camp does not stand in contradiction to return, rather it is its very precondition.

DEVIL'S ADVOCATE

During medieval times, forensic practices were kept alive by people known as "devil's advocates." These were legal experts appointed by the Church who argued against a candidate for canonization by searching for faults or instances of fraud in the miraculous accounts presented as evidence—whereas in other juridical processes it was the voice of the witness that mattered almost exclusively, hence the Church's emphasis on the practices of torture and confession. Miracles were understood as divine interventions into the earthly realm and consisted mainly of healings, sometimes visions, and only occasionally levitations. The process of their ascertainment involved the examination of bodies both living and dead, sometimes drops of blood, and even the nails and other carpentry details of objects presented as evidence. Experts competent in different areas of knowledge—physicians, artists, and artisans—were brought in where relevant and asked whether a natural explanation could be provided for a given material phenomenon. If so, the occurrence in question was determined not to be a miracle. This material forensics, central to the canonization process, was based upon a mode of quasi-scientific refutation that historian Fernando Vidal claims became the model for evidentiary and investigative legal practices.

DISPOSITION MATRIX

"When contemplating the euphemisms that have slipped into the lexicon since 9/11, the adjective Orwellian is difficult to avoid. But while such terms as extraordinary rendition, targeted killing and enhanced interrogation are universally known, and their true meanings—kidnap, assassination, torture—widely understood, the disposition matrix has not yet gained such traction. […] In truth, the matrix is more than a mere euphemism for a kill list, or even a capture-or-kill list. It is a sophisticated grid, mounted upon a database that is said to have been more than two years in the development, containing biographies of individuals believed to pose a threat to US interests, and their known or suspected locations, as well as a range of options for their disposal [targeted in drone strikes or captured and interrogated]. It is a grid, however, that both blurs and expands the boundaries that human rights law and the law of war place upon acts of abduction or targeted killing. There have been claims that people's names have been entered into it with little or no evidence." (Ian Cobain, *Guardian*, July 14, 2013)

E

EPIDEMIOLOGY

While pathology deals with the individual body, epidemiology is concerned with the statistical measurement and spatial mapping of patterns of public health, disease, and mortality at the level of populations. With the advent of a general culture of crisis response and global health concerns, epidemiological and demographic studies of conflict-related mortality have begun to acquire a forensic dimension. Statistical data is increasingly called upon to play a role at the center of controversies involving international law and politics. The collection of epidemiological and demographical data by advocacy groups and aid organizations has thus become common practice. But recent debates around conflicts in Darfur, Sudan, the Democratic Republic of the Congo, and Iraq suggest that the more pronounced this quantitative turn has become, the more it is contested—and even lends itself to political and juridical manipulation.

ERA OF THE WITNESS

When the literary critic Shoshana Felman and the psychoanalyst Dori Laub referred to the last decades of the twentieth century as "the era of the testimony," and when the historian Annette Wieviorka referred to it as "the era of the witness," they were attempting to describe a period in which the written, recorded, filmed, and exhibited testimony of the Holocaust structured our understanding of the problems of the present. Holocaust, trauma, and memory studies have made testimony into a significant force in postmodern culture. Engagement with testimony has left its mark in literature, documentary, and the visual arts. Politically, testimony has acquired a visible presence in such varied contexts as truth commissions, human rights theories, and humanitarian work.

EVIDENCE OF THINGS

"I propose to define one concept of evidence, which, I claim, was lacking. […] Concepts of testimony and authority were not lacking: they were all too omnipresent as the basis for the old medieval kind of probability that was an attribute of opinion. Testimony is support by witnesses, and authority is conferred by ancient learning. People provide the evidence of testimony and of authority. What was lacking, was the evidence provided by *things*. The evidence of things is not to be confused with the data of sense, which in much modern epistemology, has been regarded as the foundation of all evidence. […] The evidence of things is distinct from testimony, the evidence of witnesses and of authorities. […] The Renaissance had it the other way about. Testimony and authority were primary, and things could count as evidence only insofar as they resembled the witness of observers and the authority of books. Our form of the distinction between these two kinds of evidence testimony and evidence of things, is quite recent." (Ian Hacking)

EXCHANGE PRINCIPLE

Edmond Locard formulated the single most important principle in shaping the field of forensic science, namely the precept that "every contact leaves a trace." It posits that in any encounter between bodies, objects, materials, and spaces certain residual traces are deposited and exchanged. These points of contact between entities can be mapped scientifically to link the distribution of bodies and objects within space. However, Locard's thesis is premised on a local, proximate interaction and doesn't allow for the diffusion of effects through a population or the elongation of space and time between an event and its consequence. In the case of environmental pollution and anthropogenic climate change, the contact and the trace—the event and its consequence—drift apart, requiring sophisticated meditation in order to reconnect them by establishing a causal link. Climate science and especially the computational climate model, in extending forensic climatology to the scale of the planet itself, end the era in which the diffusion and elongation of causes and effects conceal wanton environmental destruction.

EXTRATERRITORIALITY

Extraterritoriality designates a mode of relation between law, representation, and space. The subjects of extraterritoriality can be either people or spaces. In the first case, and depending upon circumstances, extraterritorial arrangements exempt or exclude an individual or group from the territorial jurisdiction in which they are physically located. In the second, they exempt or exclude a space from the territorial jurisdiction by which it is surrounded. The special status thus accorded to people or spaces has political, economic, and juridical implications ranging from immunity and benefit to extreme disadvantage. In both cases, a person or space physically included within a certain territory is excluded from its usual system of laws and subjected to another. The extraterritorial person or space can therefore be said to be present at a (legal) distance.

EXTRATERRITORIAL BLIND SPOTS

While the concept of extraterritoriality has traditionally applied to people and physical spaces, it may be also extended to other objects and spheres of activity, for example to regimes of information and representation. The logic of extraterritoriality—the quality of being (legally) present at a distance—seems to apply to visual images that are either excluded or exempted from the normal workings of the law. In cases of exclusion, the images are removed from visibility and circulation by those in power through mechanisms of boycott, censorship, privatization, or nationalization; in such cases, "extraterritorial" images may remain present in public discourse, but only via indirect alternative representations. In cases of exemption (for example, in works of art that strive to suspend unjust legally discriminating regimes), the images elude the arbitrary constraints of territorial regimes, illuminate their blind spots, and contest their very foundations. In such cases, the extraterritorial image may enable us to rethink the current limits of both space and law from an ethical point of view.

F

FIELD CAUSALITY

Field causality relates to the field/forum division of Forensic Architecture. The field is not a distinct, stand-alone object, nor the neutral background on or against which human action takes place, but a dense fabric of lateral relations, associations, and chains of activity that mediates between the scales and material tendencies of large environments, individuals, and collective action. It overflows any map that seeks to frame it because there are always more connections and relations to be made in excess of its frame. Field causalities challenge contemporary epistemologies because they demand a shift in explanatory models and structures of causation. From such a perspective, the analysis of armed conflict can no longer conform to the model of criminal law that seeks to trace a direct line of causation between the two limit figures of victim and perpetrator. Establishing field causalities requires the examination of force fields and causal ecologies that are nonlinear, diffused, operate simultaneously, and involve multiple agencies and feedback loops. Whereas linear causality focuses on temporal sequenced events, field causality involves the arrangement of causes in a set of spatial relations with one another.

FIGURE–GROUND

The photograph of Earth, as a historical icon, does not merely stand for the transformation of the frontier into a border-environment, for turning the gaze from expansion to intensification, exchanging out- and inside. It also stands for the collapse of figures and grounds on a planetary scale: above all, the figure of "humanity" against the planetary backdrop of "nature," the driving engine of History with a capital *H*. The epistemological and disciplinary distinctions of modernity, particularly of the Cartesian heritage, reveal themselves to be dialectical, multi-stable figures: figures in which one or more aspects can be seen, and the relation between "figure" and "ground" can be reversed, each aspect depending on the other. Every forensic act is an act of "figuration," tracing a lost figure within an already almost undifferentiated ground, as in the process of exhumation, or of folding figure into ground by reversing the nexus of agency, the active (agent) with the passive (patient), for instance between a human actor and a natural force.

FINANCIAL FORENSICS

The term *financial forensics* has acquired particular currency since the Flash Crash of May 6, 2010—one of of the worst market collapses in history. It is exemplified by the research into the crash undertaken by a small financial data analyst, Nanex. In contrast to the official report produced by the US financial authorities, which blamed a human trader, Nanex, by examining the actual trading metadata of the crash, discovered that trades had been executed far below the threshold of conventional one-minute trading intervals. Nanex's forensic analysis procured evidence of trades that were invisible to the authorities because they lacked the technological resolution apparatuses to examine occurrences taking place on a scale of milliseconds. However, Nanex was only able to challenge the official report after they received the proprietary trading data of the supposed culprit. Within the current legal and regulatory frameworks, financial forensics therefore requires a double figure of the expert witness: the forensic analyst as well as the whistleblower—a renegade figure that in the case of the Flash Crash was an incriminated trader disclosing its proprietary data.

FORENSIC AESTHETICS

Forensic science has signified a shift in the communicative capacity and agency of things. This material approach is evident through the ubiquitous role technologies now play in determining contemporary ways of seeing and knowing. Today's legal and political decisions are often based upon the capacity to read and present DNA samples, 3D scans, nanotechnology, and the enhanced vision of electromagnetic microscopes and satellite surveillance, which extends from the topography of the seabed to the remnants of destroyed or bombed-out buildings. This is not just science,

but rhetoric carrying considerable geopolitical, socioeconomic, environmental, scientific, and cultural implications. Forensic aesthetics is thus the mode of appearance of things in forums—the gestures, techniques, and technologies of demonstration, methods of theatricality, narrative, and dramatization; image enhancements and technologies of projection; the creation and demolition of reputation, credibility, and competence.

FORENSIC FUTURES
New media technologies create possibilities for generating alternative documentary practices, which in turn allow new modes of reimagining the future to emerge. While archives and their associated documentary practices are traditionally oriented towards the past and engage with systems of collecting, classifying, and retrieving historical documents and recordings, forensic futures is an attempt to produce future-oriented archives capable of anticipating incoming events. In many contexts, such as the West Bank in Palestine, the event of violence is a regular occurrence that involves repetitive patterns of behavior, played out by a familiar cast of characters (army and ultraorthodox settlers). Rather than engage in a documentary practice that is reactive, albeit activist, which responds to unfolding events on the ground or records the aftermath of such conflicts, forensic futures sets out to document the enabling conditions of violence, and offers an archive that may be called upon to testify in the future.

FORENSIC IMAGINATION
This cultural notion of forensics asks: how might non-scientific materials such as artworks be provoked into offering a counter-testimonial to the historical narratives into which they had previously been written? Contrary to scientific conceptions of forensics as the means of uncovering the unequivocal truth of what transpired, the term *forensic imagination* is predicated upon enlarging the field of enunciation through the creative retrieval and mobilization of affects. Rather than a search for empirical truths, its objectives are oriented towards an expansion of the object's or artifact's expressive potential. As Donna Haraway has suggested, "Redistributing the narrative field by telling another version of a crucial myth is a major process in crafting new meanings. One version never replaces another, but the whole field is rearranged in interrelation among all the versions in tension with each other." In forensic science, every contact is perceived as leaving a trace. In forensic imagination every encounter is capable of being retraced.

FORENSIS
The Latin adjective *forensis* originally meant "pertaining to the forum." The forum was a busy place: among other things, a market, a meeting place, the place where the court convened. Cicero used the adjective *forensis* in a number of his speeches, and while this was often in the broader sense, as the general art of the forum, he seems at times to have used it in the more narrow, legal sense. In the Middle Ages the Flemish translator Willem van Moerbeke used *forensis* to translate the Greek adjective *dikanikos* which appears in Aristotle's *Rhetoric*, and which literally means "judicial." This was an unambiguously legal use of forensis, though restricted to the way lawyers plead. The English language only absorbed the Latin term in the form "forensic" in the seventeenth century. The original meaning—pertaining to the forum or court—persisted into the early nineteenth century, when Carlyle spoke of "forensic eloquence." Only in the mid-nineteenth century, during a time of great scientific development, did the term *forensic* become used to denote a legal-scientific investigation. The first instance of this modern meaning of forensic can be found in H. J. Stephen's *New Commentaries on the Laws of England*, published in four volumes in 1844. Early in the introduction he states: "To gentlemen of the faculty of physic the study of the law is attended with some importance, not only to complete their character for general and extensive knowledge, a character which their profession has always remarkably deserved, but also to enable them to give more satisfactory evidence in a variety of cases in which they are liable to be examined as witnesses."

G

GENOCIDE DENIAL
Holocaust negation developed alongside other political debates around the confirmation or denial of genocide. In the late 1970s, the context was the entangled killings on a massive scale in Cambodia by US bombing and by the Khmer Rouge. In the early 1980s, mass killing in Central and South America, and in the 1990s in Yugoslavia and Rwanda, were negated by several politically motivated groups: the techniques commonly used for such denial involve finding a single piece of material evidence to negate witness testimony, or insisting on negative evidence.

GEOFORENSICS
In relation to contemporary forms of violence that are thriving under the cover of environmental complexity, new technologies of forensic analysis and remote sensing are becoming increasingly relevant for legal disputes. While techniques such as DNA analysis, bone sampling, or mass spectrometry have revolutionized the practice of legal medicine—allowing an investigator to determine whether the presence of a toxic metal in a body resulted from criminal action—the development of satellite spectral imagery, ground-penetrating radar, and reflective seismology have made visible previously imperceptible aspects of the earth. In cases where the geological and human domains are intimately connected, forensics and geosciences can no longer remain separate. The term *geoforensics* stresses that such practices must come together to form a common enquiry, making it possible to investigate human rights claims and environmental disputes as part of a common condition. But more than the application of scientific expertise to legal disputes, geoforensics is a practice that mobilizes the translation, analysis, and visualization of the earth for the urgent reformulation of contemporary political disputes.

GLOMAR DENIAL
The Glomar response is a form of denial that aims to add no information to the public domain. Under its terms, US state agencies are authorized to "neither confirm nor deny the existence or nonexistence" of documents requested under the Freedom of Information Act (FOIA). The Glomar response is justified on the basis that the very fact of the "existence or nonexistence" is itself information whose disclosure should be banned for "security reasons." The term is derived from a ship named the *Glomar Explorer* built by the CIA and used to recover a sunken Soviet submarine in 1968. When the journalist Ann Phillippi filed a request under the FOIA for documents related to the *Glomar Explorer*, the CIA, in its attempts to censor Phillippi's story, claimed that it could "neither confirm nor deny" that documents about either the ship or the censorship existed, and thus the Glomar response was born.

GROUND-PENETRATING RADAR (GPR)
GPR sends out electromagnetic energy as radar pulses that penetrate the subsoil to a depth of up to fifteen meters. When they bounce back, they reveal an image of minute differences in the densities of the subsurface. GPR can detect solid objects, changes in material consistency, and even voids and cracks. It works by reading the reflected signals from submerged structures (the level of detail is governed by the increments of the scan and can be adjusted). Differences in material density and their spatial allocation and depth are subsequently plotted and used to create a full-scale 3D digital replica of the subsoil that can disclose buried features such as an ancient waterway or the existence of a mass grave. Underground objects are different from the objects on the surface of the earth. Above they are fetishized forms with clear edges and conceptual unity, below they are mere material densities dissipating and flowing into common ground.

H

HABEAS CORPUS
This ancient writ, which translates to "may you have the body," stipulates that a person under arrest must be physically brought before a judge. The judge must see and hear the suspect live. The voice is a corporeal product that contains its own excess, with this corporeal excess announcing to the court the absolute presence of the witness. This bodily excess of the voice resides not in its linguistic functions, but in its nonverbal effects; such as its pitch, accent, glottal stops, intonations, inflections, and impediments. As by-products of the event of language, these effects reveal other kinds of evidence, evidence that may evade the written documentation of legal proceedings but does not escape the ears of the judge and of those listening to a trial in the space of the courtroom.

HYSTERESIS
Hysteresis is a condition of persistence commonly affecting analog media, whereby the previous states of a system remain discernable as residual memory traces. This effect was first reported in 1947 when two new kinds of magnetic audio tapes were introduced with varying degrees of coercivity (resistance to demagnetization); it may also result from errant microns located at the edge of a recorded track which have escaped full erasure and haunt subsequent recordings. In the digital realm, the persistence of trace evidence from previous data inscriptions is known as data remanence. Although erased digital data is flagged by the system as a space that is now available for use, the actual data remains in place until such time that its space on the hard drive is actually required. This future-oriented allocation of data-space allows data that awaits its erasure to be recovered by various techniques of forensic data recovery.

I

INDIRECT MORTALITY
The casualties of war extend far beyond the numbers of soldiers and civilians who die violently in battles. War creates "indirect mortality" in populations involved—largely through the spread of infectious disease, destruction of assets, diminished access to basic healthcare, hunger, malnutrition, and the diversion of scarce resources away from basic services. Figures for indirect mortality, referring to avoidable deaths that either resulted from negligence or were intentionally allowed, are difficult to establish; they are buried in comparative statistical calculations of trends in mortality rates. Indirect mortality rates are rarely used even among those aiming to mobilize world opinion against instances of oppression. The difficulty in establishing and thus protesting against indirect mortality also contributes to the capacity of militaries and states to exercise subtle forms of killing: for example, through the destruction and degradation of environmental conditions, in order to affect the quality of water, hygiene, nutrition, and healthcare, or by restricting the flow of life-sustaining infrastructure, forbidding the importing of water purifiers and much-needed vitamins, and by making it difficult for patients to travel.

INFERENTIAL EVIDENCE
Inferential evidence is largely governed by Bayes' theorem—an eighteenth-century theorem for the calculation of probabilities under changing or uncertain conditions. Its role in the presentation of forensic evidence has been highlighted recently by appeal cases which have thrown into relief the question of probability versus "hard evidence." Bayesian networks are algorithmically extended ways of calculating or formulating relationships between different kinds of variables—inferential, probabilistic relations as distinct from causal ones. They are fundamental to the understanding of the probabilistic nature of all forensic evidence. Bayes is used as a portrait of reasoning, or of rationality as a decision-making process, and hence as a modeling process for "learning" algorithms, and has been utilized as a core model for understanding phenomena ranging from financial markets, to counterinsurgency, to forms of design as a means of crime or terror prevention. Evidence ceases to become located purely within a juridical framework and is taken to an organizational and managerial scale where we can begin to see relationships between police, military, finance, management, and so on. (Andrew Lowe)

J

JURIS-DICTION
If we divide the term *jurisdiction*, which connotes a territorial range over which a legal authority extends, we see that *juris* refers to a legal authority or right and *diction* refers to speech. *Diction* in linguistics is also defined as the manner of enunciating and uttering sounds and words, indicating not simply speech but the process of enunciation and amplification of words. From a perspective informed by the etymology of the term *jurisdiction*, we may see the law itself as a speech-space in which those within its range of audibility are subject to its authority. As a fundamental principle of legal governance, jurisdiction reveals to us the power of sound in the construction of the space and time of the law.

L

LAWFARE
With the introduction and popularization of international law in contemporary battlefields, all parties to a conflict might seek to use it for their tactical and strategic advantage. The former American colonel and military judge Charles Dunlap, who was credited with the introduction of this term in 2001, suggested that *lawfare* can be defined as "the strategy of using—or misusing—law as a substitute for traditional military means to achieve an operational objective." In the hands of non-state actors, the lawfare effect is created by an interaction between guerrilla groups that "lure militaries to conduct atrocities" and human

rights groups that engage in advocacy to expose these atrocities, and who use whatever means for litigation they have at hand. Lawfare refers to the multiple ways by which contemporary warfare is conditioned, rather than simply justified, by international law. In both cases international law and the systems of courts/tribunals that exercise and enact it are not conceived as spaces outside the conflict, but rather as one of the battlegrounds internal to it.

LESSER EVIL
Drone warfare is often presented as the "lesser-evil" alternative to ground occupation by troops and the much larger death toll, destruction, and civilian misery that they cause. It is also presented as an alternative to the kidnapping, indefinite detention, and violent interrogations that came with the recent occupations in Iraq, for example. However, by providing a lesser-evil alternative to military incursions, drone strikes also enable military action where none was previously possible. Although most critical accounts of drone warfare are concerned with a line connecting several points—presidential decision, UAV operators, drones, and their targets—the conditions that enable this warfare include territorial, juridical, and political arrangements. The "injection of kinetic energy into the fabric of social relations," as the military has it, affects many more people than those physically hit.

LYING
"For secrecy—what diplomatically is called discretion as well as the *arcana imperii*, the mysteries of government—and deception, the deliberate falsehood and the outright lie used as legitimate means to achieve political ends, have been with us since the beginning of recorded history. Truthfulness has never been counted among the political virtues, and lies have always been regarded as justifiable tools in political dealings. Whoever reflects on these matters can only be surprised how little attention has been paid, in our tradition of philosophical and political thought, to their significance, on the one hand, for the nature of action and, on the other, for the nature of our ability to deny in thought and word whatever happens to be the actual fact. […] A characteristic of human action is that it always begins something new, but this does not mean that it is ever permitted to start *ab ovo*, to create *ex nihilo*. In order to make room for one's own action, something that was there before must be removed or destroyed, and things as they were before are changed. Such change would be impossible if we could not mentally remove ourselves from where we are physically located and imagine that things might as well be different from what they actually are. In other words, the ability to lie, the deliberate denial of factual truth, and the capacity to change facts, the ability to act, are interconnected; they owe their existence to the same source, imagination." (Hannah Arendt)

M

MATERIAL AESTHETICS
For a building surveyor, architecture is a sensor, in that it is aestheticized to its environment. Its form of aesthetics is a primer for and is primary to human judgment. Aesthetics was originally understood as that which pertains to the senses, but in this context it designates not the human senses but rather the sensorial dimension of matter itself: the ways in which matter can detect, register, and respond not only to contact and impact, but also to influences in its environment and even to remote presence. Ground-penetrating radar, 3D scanners, remote sensing, and other prosthetic technologies mediate, and thus augment, the aesthetic sensitivity of material formations, buildings, and territories. Material aesthetics is the first and fundamental layer of a multidimensional concept of *forensic aesthetics*. Matter is an aesthetic sensorium in as much as its mutations register minute transformations, variations, and differences within a field of multiple forces.

MODEST WITNESS
In her critique of scientific objectivity, Donna Haraway forwards the notion of the modest witness, which she contends is one of the founding virtues of what we call modernity. "The modest witness is the legitimate and authorized ventriloquist for the object world, adding nothing from his mere opinions, from his biasing embodiment. And so he is endowed with the remarkable power to establish the facts. He bears witness: he is objective; he guarantees the clarity and purity of objects. His subjectivity is his objectivity. His narratives have a magical power—they lose all trace of their history as stories, as products of partisan projects, as contestable representations, or as constructed documents in their potent capacity to define the facts. The narratives become clear mirrors, fully magical mirrors, without once appealing to the transcendental or the magical." (Donna Haraway)

MUMMY COMPLEX
"If the plastic arts were put under psychoanalysis, the practice of embalming the dead might turn out to be a fundamental factor in their creation. The process might reveal that at the origin of painting and sculpture there lies a mummy complex. The religion of ancient Egypt, aimed against death, saw survival as depending on the continued existence of the corporeal body. Thus, by providing a defense against the passage of time it satisfied a basic psychological need in man, for death is but the victory of time. To preserve, artificially, his bodily appearance i s to snatch it from the flow of time, to stow it away neatly, so to speak, in the hold of life. It was natural, therefore, to keep up appearances in the face of the reality of death by preserving flesh and bone." (André Bazin)

MURKY EVIDENCE
Nature has become a central space in which cultural and political rights are bound, and thus with increasing frequency and relevance, ecological systems have come to inhabit the courtrooms of national and transnational forums as potential witnesses of legal violations. As Earth enters into the legal arena as a disputed object, the scientific and documentary techniques employed to mediate its testimony appear as sites through which the construction of historical-political narratives is disputed. To follow the histories inscribed in murky earth samples extracted from the soils of environmental disaster zones, is to map out the messy assemblages of scientific practices, NGO advocacy, international law, and global geopolitics that gather around nature. Animated by a legal court, organic matter becomes a vibrant and talkative entity whose opaque speech calls for a radical universality according to which human and nonhuman rights are mutually constitutive and interdependent.

N

NEGATIVE EVIDENCE
This term indicates an absence of material evidence that is evidence in itself. Negative evidence can, potentially, be used to dismantle complex constructions and networks of knowledge. It is like an antibody to the practice of producing complex data assemblages.

NULLUM CRIMEN SINE LEGE
The axiom *nullum crimen sine lege (literally "no crime without correspondent law")* is conventionally adopted and assumed as the basis of modern criminal legislation. Where law is clear and articulated thoroughly, when the space of law is solidly thick and wide, evil is supposed to be prevented and obedience/authority respected—and the evil of punishment is perpetrated according to necessity: the necessity of law. Using a spatial metaphor, this means that only when an act falls into the space of law—into its thickness—can law and its derived mechanisms of punishment can be applied. What if we reverse the problem of the thickness and take into consideration the anomic space of the *sine lege* instead of the space of the *lege*? Criminal cases have often to do with the spaces in which they are committed, spaces which until the final judgments remain somehow liminal (at the border between guilt and innocence) and anomic, and which only the law can make nomic. What does it mean to generate practices within anomic states and spaces? What happens when this theoretical problem is transferred into the materiality of an anomic space? (Nicola Perugini)

O

OSTEOBIOGRAPHY
The great forensic anthropologist Clyde Snow called the process of identifying human remains *osteobiography*, or the biography of bones. The bones, constituting neither part of the living human, nor simply an object, bear the imprint of a lived life. Snow explained that the skeleton contains "a brief but very useful and informative biography of an individual […] if you know how to read it." The word "biography" tells us that what is of concern is not just the moment of death but the entire history of a life that has been fossilized into the morphology and texture of bones. In a recent interview Snow remarked: "When we see bones on the table they are dead. But in the living body, the bone is a very dynamic tissue, and it is very responsive to stresses, occupational stress for example, sports, injury, other activities. We take that osteobiography, we compare it with our missing person. In that way we can gradually come down to eliminate more and more deceased until we identified the person we wanted to find."

P

PARRHESIA
In ancient Greek *parrhesia* meant "to speak everything" and in ancient Hebrew the word evolved to mean "in face of the public." These two meanings shape the critical practices of forensics. In a series of lectures dealing with the "fearless speech" characterized by parrhesia, delivered a year before his death, Michel Foucault used the term to designate the courage to risk one's life in order to tell a necessary and unpopular truth. Parrhesia, Foucault explained, is a form of criticism articulated "in a situation where the speaker or confessor is in a position of inferiority with respect to the interlocutor. The parrhesiastes is always less powerful than the one with whom he or she speaks. The parrhesia comes from 'below,' as it were, and is directed towards 'above.'" The parrhesiastes choses to speak the truth to those who try to hide, deny, or cannot accept it. "Parrhesia, then," Foucault continued, "is linked to courage in the face of danger: it demands the courage to speak the truth in spite of some danger. And in its extreme form, telling the truth takes place in the 'game' of life or death."

PATTERN RECOGNITION
What trace is left by a crime that has not yet happened? Predictive forensics, the futurology of contemporary warfare, seeks to trace future crime in the analysis of historical patterns. Signature strikes that target unknown people are based on pattern-of-life recognition detected through signal intercepts, human sources, or vertical surveillance. The specific patterns that the United States believes demonstrate the inclinations of individuals and groups to undertake militant action is kept secret, but certainly involve forms of gathering and movement within areas or roads defined as "toxic." Hunted by semi-robotic platforms, militant groups can and do learn how to adapt to these deadly pattern recognition algorithms and camouflage their actions accordingly. Militant groups and the pattern recognition algorithms that track their tracks are thus in a constant and mutual state of recalibration and coevolution.

PHARMAKON
A *pharmakon* is at the same time a poison and a remedy, simultaneously the cure and the illness, and its causes. Choosing only one of its meanings leaves the concept incomplete; the pharmakon thrives in the state of nonagreement. The pharmakon first appeared in Plato's account of writing as both poison and remedy for the forgetfulness of the soul. Later it is Jacques Derrida who gives a contemporary account of Plato's pharmacology of writing as pharmakon. For Derrida the pharmakon is a dissident concept of philosophy that refuses to be translated as either poison or remedy; rather it necessarily carries both properties.

POLITICAL PLASTIC
Forensics aestheticizes territorial formations in different ways. The incessantly transforming morphology of conflict zones is the result of relations between a wide multiplicity of agents and the environments in which they are located. The spatial imaginary of these zones corresponds to a political plastic (this in homage to Joseph Beuys who once called art "social plastic") and in them conflicting geopolitical forces continuously interact with the materiality of the surface of the earth as they slow into form, or accelerate in a blast. Forms and spatial organizations, rather than the result of a top-down system, are the result of immanent clashes of force.

PREDICTIVE FORENSICS
Predictive forensics is associated with both the study of climate change and that of security. Both have a preemptive logic in that crucial evidence lies somewhere in the future, and the future is of course the domain of mathematics, algorithms, and digital representations. In relation to the long-term, each field seemingly looks at an opposite end of the economical spectrum: security and military think tanks such as RAND are searching for indicators of instability such as economic collapse, devaluation of currencies, disintegration of economies, and the collapse of central government control; meanwhile, long-term climate change models are tuned to economic and

infrastructural development worldwide as factors that will aggravate climate change. So while it may seem that the two fields of study have little in common, both look at the economy, both are tuned to financial indicators as the earliest signals of emerging risk in a system, and both actually use the modeling toolbox of finance. Both fields also conceive of risk as something that is global and cannot be spatially contained.

PROBABILITY
Probability measures the likelihood that an event will occur or has occurred. Probability could thus be understood as the way in which doubt exists in relation to objects. Philosopher Ian Hacking explains that probability has both subjective and objective meanings. "Subjective probability" has to do with evaluating the authority of witnesses—traditionally by social status, nobility, or wealth. "Objective probability" on the other hand relates to the properties of the object or phenomena under analysis. In the middle of the seventeenth century the second meaning of probability started shifting the first. But the two continuously intertwine and entangle; forensics is about the probability of the expert to decipher the probability of the events. Science and law measure truth as a position on a variable scale of probability. Terms such as the "balance of probability" or "beyond reasonable doubt" reveal the constant operations of probability calculations. Scientific literature simply notes the measure of uncertainty and the margin of error; but law, like politics, must render a decision.

PROPORTIONALITY
Within the context of International Humanitarian Law (IHL), proportionality is a moderating principle that seeks to constrain the use of force. The principle was formally codified in 1977 in Protocol I of the Geneva Conventions. The protocol prohibits "an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated." Proportionality is thus not about clear lines of prohibition, but rather about calculating and determining balances and degrees. Although violence is in constant need of measurement, the principle of proportionality provides no scale, no formulas, and no numerical thresholds. Instead, it demands assessment on a case-by-case basis, within parameters that are always relative and immanent. By opening a field of equivalence in which different forms of potential and actual violence, risk, and damage become exchangeable, proportionality approximates an algorithmic logic of computation—although, still, in practice, it is rarely computed.

R

RADICAL METEOROLOGY
Radical meteorology refers to an entanglement of contemporary state, institutional, and environmental violence, where the earth is an agent for political transformation. As severe weather events and natural disasters reorganize space in ways similar to those by which conflict transforms environments, the scientific and political problem arises of discerning between violence caused by humans and by nature. Radical meteorology is a method for reading typologies of spatial violence where nature itself is incriminated. It seeks to locate and problematize such a site of violence in order to shape understandings of its political possibilities.

RADIOACTIVE FOSSIL
"It is as if the past surfaces not in itself but in the shape of personalities which are independent, alienated, off-balance, in some sense embryonic, strangely active fossils, radioactive, inexplicable in the present where they surface, and all the more harmful and autonomous." (Gilles Deleuze)

REMAINDER
"A trace is never present, fully present, by definition; it inscribes in itself the reference to the specter of something else. The remainder is not present either, any more than a trace as such. And that is why I have been much taken up with the question of the remainder, often under this very name or more rigorously under that of *restance* or remaining. The remaining of the remainder is not reducible to an actual residue, or to what is left after a subtraction, either. [...] Often, like the trace, I associate it with ashes: remains without a substantial remainder, essentially, but which have to be taken account of and without which there would be neither accounting nor calculation, nor a principle of reason able to give an account or a rationale (*reddere rationem*), nor a being as such. [...] The remains of what remains cannot be calculated in this way. But there will also be remainder effects, sentences fixed on paper, more or less readable and reproducible. These remainder effects will thereby have presence effects—differently in one place or another, and in an extremely uneven way according to the contexts and the subjects that will get attached to it." (Jacques Derrida)

REMOTE SENSING
"Seeing presupposes distance, decisiveness which separates, the power to stay out of contact and in contact avoid confusion. Seeing means that this separation has nevertheless become an encounter. But what happens when what you see, although at a distance, seems to touch you with a gripping contact, when the manner of seeing is a kind of touch, when seeing is contact at a distance? What happens when what is seen imposes itself upon the gaze, as if the gaze were seized, put in touch with the appearance? What happens is not an active contact, not the initiative and action which there still is in real touching. Rather, the gaze gets taken in, absorbed by an immobile movement and a depthless deep. What is given us by this contact at a distance is the image, and fascination is passion for the image." (Maurice Blanchot)

ROMAN FORUM
From Piranesi to Canaletto, eighteenth-century painters were fascinated by the recently excavated and partly reconstructed ruins of the Roman Forum. The temple had a special place in the history of the forum. In Republican times it served as a meeting place for the Senate; from the middle of the second century BC the bases of the columns were the speaker's platform. But most crucially, in the imperial period the temple housed the office for weights and measures, the standards for all calculation and exchange. The destruction of the forum was thus also the destruction of the institutions and the tools that could measure and quantify this very destruction. In Piranesi's etchings, the ruins of the forum stand in a large field where farmers engage in plowing. In Canaletto's painting a group of "grand tourists" appear to be studying three of its surviving temple columns. The field is not the rubble of buildings damaged in faraway wars, and it is not discussed in the safety of a pristine new forum, but what is debated is quite literally the ruins of the forum in the ruins of the forum.

RUIN(S)
In modern languages, the singular ruin conserves a meaning very close to its Latin origin—*ruina*, "fall," "collapse." To designate the material traces of that event, the indefinite plural ruins is still preferred. This nuance too we inherited from Latin which, in coining the two-sided term, foresaw the stakes at its core and laid down the ground for a timeless problem: ruins can never be grasped as a single entity; made of uncountable links to pasts and futures, their hazy contours always refer to a plurality of potentials.

S

SHADOWING TARGETS
With the drone operator both 12,000 kilometers away from the target and 50 centimeters from the screen, this form of assassination is simultaneously remote and proximate, located somewhere between the classical roles of the archer and the cloak-and-dagger assassin. A former Israeli officer and now military advisor once put it to us in these terms: "Military units think like criminals . . . like serial killers . . . [they] are allocated an area and learn it for months, they study the persons within the enemy organization they are asked to kill, their appearance, their voice [as heard in telephone tapping], their habits . . . like professional killers."

SLOW VIOLENCE
"We are accustomed to conceiving of violence as immediate and explosive, as erupting into instant, concentrated visibility. But I wanted to revisit this assumption and consider the relative invisibility of slow violence. By that I mean a violence that is neither spectacular nor instantaneous, but instead incremental, whose calamitous repercussions are postponed for years or decades or centuries. Emphasizing the temporal dispersion of slow violence can change the way we perceive and respond to a variety of social crises, like domestic abuse or post-traumatic stress, but it is particularly pertinent to the strategic challenges posed by environmental calamities. Environmentalists face a fundamental challenge: How can we devise arresting stories, images, and symbols that capture the pervasive but elusive effects of slow violence? [...] Our cultural moment is in thrall to speed and spectacle, which has the effect of distorting our perception of what counts as violence." (Rob Nixon)

SOUNDING
The depth of ocean floor is now measured through echo sounding—the transmission of sound pulses in the water. However, in the mid-nineteenth century the term "sounding," though prescient, was a misnomer, as it did not involve sound. Sounding was the name of the technique employed by research ships such as the HMS *Challenger* to measure the depth of the ocean floor by dropping a weighted line to the sea bottom. The line used to measure the distance from the ship to the ocean floor was made of rope, while piano wire was used when pulling up samples from the ocean floor, thus the association with acoustic phenomena.

STONE TAPE THEORY
"Proposed in the 1970s as a possible explanation for ghosts. The Stone Tape Theory speculates that inanimate materials can absorb energy from living beings. In other words a 'recording' or track is laid down during moments of high tension, such as murder. This stored energy can consequently be released, resulting in a display of the recorded activity. The replay can take the form of a full manifestation or partial sounds such as voices or footsteps. Paranormal investigators commonly refer to such phenomena as residual hauntings. Ghosts are not spirits but non-interactive recordings similar to the registration capacities of an audiotape machine that can playback previously recorded events. While the theory may explain some ghostly sightings, no one knows what the recorded energy actually is. However, the possibility that it could be composed by our natural electric and magnetic fields is one of the explanations that the Stone Tape Theory advances." (Steve Goodman)

STRATEGY OF RUPTURE
Jacques Vergès began his legal career during the Algerian war where he defended a series of militants opposing the French and Israeli states. He selected his cases on the grounds that they constituted precedent-setting legal challenges that exposed paradoxes between the state's democratic pretense and its colonial realities. His legal performance in court was an immanent critique that he called "the strategy of rupture" in which he used the public stage of the courts to question the legitimacy of the legal process itself; to turn the tribunal into a tribune to expose the crimes of states and historical injustice. This strategy meant that the anti-imperial spirit had to engage with the law rather than operate in a mode of rupture. The paradox of this form of legal activism is that wearing one's militancy would render one ineffective. To be effective in lawfare you must never admit you practice it.

T

TELE-TRIBUNALS
"The media-based arming of the courts has been encouraged by a tendency within the justice system itself, a move toward tribunalization. Many of the most recent international courts, such as that at The Hague, have their origins in the tribunal. Tribunals occur when the extant justice system is not appropriate; during transitional periods, after a change in government, and so on. Ruti Teitel calls these tribunal processes 'transitional justice,' processes in which the illegality of an overthrown system is investigated. From their beginnings, these tribunals have shown a tremendous affinity for the medium of television, because they depend on a public audience for their very existence. In the international courts that originate from the tribunal, then, the presence of cameras has already been written into the architecture." (Cornelia Vismann)

TERRA-POLITICA
The history of modernity can be narrated as a "longue durée" process of environing the earth. After the production of a "terrestrial globe" initiated with early modernity/colonialism, the "bio-spherical globe" that emerges with bio-geographic models in the late nineteenth century, and the ecosystemic turn of the '60s and '70s, we may be experiencing the formation of a different perspective towards the planet, more geological than territorial or biological, and therefore the formation of a political terrain defined not only by the geo and the bio, but also by a novel plain of struggle that, for lack of better term, could be tentatively named the earth-political—*terra-politica*.

TESTIMONY
"[T]here is no testimony that does not at least structurally imply in itself the possibility of fiction, simulacra, dissimulation, lie, and perjury—that is to say, the possibility of literature. [...] If this possibility that it seems to prohibit

were effectively excluded, if testimony thereby became proof, information, certainty, or archive, it would lose its function as testimony." (Jacques Derrida)

TRIALS OF THINGS
Built environments are composite assemblies of structures, spaces, infrastructure, services, and technologies with a certain capacity to act and interact with their surroundings. They structure rather than simply frame events, although never perfectly so. The attribution of liability to material things is almost as old as law itself. It can be traced to the origins of ancient Greece, where a class of Athenian judges presided over a special court in charge of cases brought against unknown agents and inanimate objects. Miguel Tamen, who discusses this capacity of things, describes a curious incident in which a statue of Theagenes made after the athlete's death was beaten by one of his rivals by way of revenge, until the statue fell and killed him. The statue was put on trial for murder, was found guilty and thrown into the sea, only to be recovered years later.

THRESHOLD OF DETECTABILITY
The threshold of detectability is the state of visibility at which an object teeters on the brink of being observable or not observable. This is an epistemologically enriched status in forensic terms. In it the materiality of the thing represented—a building for example—and the materiality of the thing representing that object—a film, digital photo, or satellite image—both its material state and the mechanical means whereby this condition is archived/witnessed come simultaneously into view and under intense scrutiny. On either side of the threshold of detectability, when an object is captured either in high resolution or recorded at such a low resolution that there is nothing to be seen, we can only examine one or the other of its states, the object represented or the surface representing that thing.

U

UNDERGROUND FETISHISM
If we conceive of planetary politics as a dynamic system, we might say that its most powerful vector of attraction is the underground. As in Jules Verne's description in *Voyage to the Centre of the Earth*, the underground today is still a mysterious domain, peopled by skulls, riches, and strange creatures. But this mystery has only reinforced its power of attraction, and contrary to the sixties' claim that space was the final frontier, what the last decades have shown is a relentless rediscovery of the underground. In fact the underground should be conceived, not as one homogenous entity, but as a zone where new unforeseen attractors are constantly emerging. But since it is as much a resource for economic, military, and scientific claims—as it is for sacred, religious and political ones—the attempts at prediction and surveillance regarding it participate in its constitution as a fetish, emerging at the encounter of incommensurable epistemic, technological, and political projects. If humanity placed satellites in the sky, it was so that today they could survey the earth's surface, attempting to decipher its inner behaviors.

URBAN WARFARE
In the neocolonial wars of the post-9/11 period, as armed conflict was increasingly drawn into the density, complexity, and heterogeneity of urban areas, the city was no longer merely the location of war, but rather the means by which armed conflicts took shape. Spatial transformations have thus become an important means for asserting control. The nature of these transformations included both construction and destruction—of infrastructure, roads, bridges, barriers, walls. Borders (around neighborhoods, cities, states, or groups of states) have both hardened along the perimeter and extended into frontier zones where surveillance, policing, and management, as well as acts of killing can happen outside of legal preview.

V

VICISSITUDES OF LISTENING
"The testimony to the trauma thus includes its hearer, who is, so to speak, the blank screen on which the event comes to be inscribed for the first time. […] The listener, therefore, has to be at the same time a witness to the trauma witness and a witness to himself. […] He needs to know that the trauma survivor who is bearing witness has no prior knowledge, no comprehension and no memory of what happened. That the speakers about trauma on some level prefer silence so as to protect themselves from the fear of being listened to—and of listening to themselves. That while silence is defeat, it serves them both as a sanctuary and as a place of bondage. Silence is for them a fated exile, yet also a home, a destination, and a binding oath. To *not* return from this silence is rule rather than exception. The listener must know all this and more. He or she must *listen to and hear the silence*, speaking mutely both in silence and in speech, both from behind and from within the speech." (Dori Laub)

Contributors

LAWRENCE ABU HAMDAN is a London-based artist and a researcher on the Forensic Architecture project. His solo exhibitions include "The Freedom of Speech Itself" (2012) at the Showroom, London, "Aural Contract: The Whole Truth" (2012) at Casco, Utrecht, and most recently "Tape Echo" (2013) at Beirut in Cairo. His works have been included in exhibitions at Tate Modern, London M HKA, Antwerp, and Lisa Cooley, New York. Additionally, Abu Hamdan's ongoing project "Aural Contract" has recently been presented at Arnolfini, Bristol (2013), the Taipei Biennial (2012), and as part of his residency at Iaspis, Stockholm (2013). Abu Hamdan is one of the four artists comprising the group Model Court, whose first major solo presentation was "Resolution 978HD" at Gasworks, London (2013). He has written for various publications such as *Cabinet* magazine, *Ibraaz*, and *Manual for Treason* (for the 10th Sharjah Biennial). Abu Hamdan is a lecturer in the Department of Visual Cultures and a PhD candidate in the Centre for Research Architecture at Goldsmiths, University of London.

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MAAYAN AMIR is an artist, curator, and researcher on the Forensic Architecture project. Her collaborative works with Ruti Sela have been shown internationally at the Sydney Biennale (2006), the Istanbul Biennale (2009), the Berlin Biennale (2010), and in venues such as Centre Pompidou, Art in General, Tate Modern, Jeu de Paume, Ludwig Museum, among others. In 2009 she and Sela initiated "The Exterritory Project" for which they won an award for young artists from the UN Educational, Scientific and Cultural Organization (UNESCO) in 2011. She has edited a book about Israeli documentary cinema and has also curated many exhibitions. Amir teaches theory at Bezalel Academy of Arts and Design (Jerusalem) in the MFA program, as well as in the Fine Arts Program at Haifa University, Sapir Academic College, Technion – Israel Institute of Technology, and other academic institutes. Throughout 2011, she was a guest resident at the Rijksakademie, Amsterdam. She is currently a PhD candidate in the Centre for Research Architecture at Goldsmiths, University of London.

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JACOB BURNS a writer and current MA student in the Centre for Research Architecture, Goldsmiths, University of London. After completing his BA in History of Art at Goldsmiths he worked with the Naming the Dead project at the Bureau of Investigative Journalism in London. He is co-organizer of "Grounding: Philosophy and the Law," an INC philosophy lecture series at Goldsmiths (2013–2014). He is a research assistant on the Forensic Architecture project, focusing on the drone strikes investigation.

HOWARD CAYGILL is Professor of Modern European Philosophy in the Centre for Research in Modern European Philosophy at Kingston University and author of *Art of Judgement* (Blackwell, 1989), *A Kant Dictionary* (Blackwell, 1995), *Walter Benjamin: The Colour of Experience* (Routledge, 1998), *Levinas and the Political* (Routledge, 2002), and most recently *On Resistance: A Philosophy of Defiance* (Bloomsbury, 2013).

GABRIEL CUÉLLAR is an architect. He obtained an Advanced Master of Architecture from the postgraduate program at the Berlage Institute in Rotterdam. After graduating from Carnegie-Mellon University in 2008, he worked with various offices in the United States, Switzerland, France, and the Netherlands. In 2011, he was project leader for the winning Taichung Gateway Park competition with Philippe Rahm architects. Since 2012 he has been working collaboratively in his own architecture practice, Relation.

DAAR (Decolonizing Architecture Art Residency) is an art and architecture collective and residency program based in Beit Sahour, Palestine. The group's core members are Sandi Hilal, Alessandro Petti, and Eyal Weizman. DAAR's work combines discourse, spatial intervention, education, collective learning, public meetings, and legal challenges. DAAR's practice is centered on one of the most difficult dilemmas of political practice: how to act both propositionally and critically within an environment in which the political force field is so dramatically distorted. It proposes the subversion, reuse, profanation, and recycling of the existing infrastructure of a colonial occupation. DAAR projects have been shown in various biennales and museums, among them Venice Biennale, the Bozar in Brussels, NGBK in Berlin, the Istanbul Biennial, the Architecture Biennale Rotterdam, Home Works in Beirut, Architekturforum Tirol in Innsbruk, the Tate in London, the Oslo Triennial, the Centre Pompidou in Paris, and many other places. DAAR's members have taught, lectured, and published internationally. In 2010 DAAR was awarded the Price Claus Prize for Architecture, received the Art initiative Grant, and was shortlisted for the Chernikhov Prize. DAAR's projects are documented in the book *Architecture after Revolution* (Sternberg Press, 2013).

EITAN DIAMOND is an international lawyer with an expertise in international humanitarian law and human rights law. He serves as legal adviser to the delegation of the International Committee of the Red Cross (ICRC) in Israel and the Occupied Territories. Before joining the

ICRC in 2007, he was a research officer and legal adviser at B'Tselem—The Israeli Information Center for Human Rights in the Occupied Territories. He is a co-founder of the London-based international charity Videre Est Credere, which seeks to expose and uproot human rights violations through video documentation. He has an LLB from the Hebrew University of Jerusalem and an LLM in Public International Law from the London School of Economics and Political Science. He is currently a doctoral candidate at Tel Aviv University where his research addresses the role of aesthetic judgment at the intersection of law, war, and media.

EMILY DISCHE-BECKER is a writer and editor who divides her time between Beirut and Berlin.

ANSELM FRANKE is a curator and writer based in Berlin, as well as a research fellow on the Forensic Architecture project. Since 2013 he has been Head of Visual Arts and Film at the Haus der Kulturen der Welt (HKW) in Berlin. He was the curator of the 2012 Taipei Biennial. His project "Animism" has been presented in Antwerp, Bern, Vienna, Berlin, New York, Shenzhen, Seoul, and Beirut from 2010 to 2014. At the HKW, he cocurated (with Diedrich Diederichsen) "The Whole Earth: California and the Disappearance of the Outside" (2013), and "After Year Zero: Geographies of Collaboration" (2013). From 2006 to 2010 he was artistic director of Extra City Kunsthal Antwerp, where he curated exhibitions such as "Sergei Eisenstein: The Mexican Drawings." He was a cocurator of Manifesta 7 in Trento, Italy. Until 2006, he was curator at the KW Institute for Contemporary Art in Berlin. Franke has edited numerous publications and regularly contributes articles to magazines such as *e-flux* journal and *Parkett*.

GRUPA SPOMENIK / MONUMENT GROUP is an art-theory group that has been producing public space for a political and critical–ideological discussion of the wars in the Socialist Federative Republic of Yugoslavia and their consequences. It has initiated reading and discussion groups, staged lecture–performances, and engaged in self-education through encounters with victims, perpetrators, and witnesses of the extreme terror, genocide, and ethnic cleansing. Its project "Mathemes of Re-association," which commenced in 2008, focuses on the Srebrenica genocide. In the project, Grupa Spomenik examine the conditions under which art can produce its own discourse on the genocide and the state of contemporary–permanent–war. The Living Death Camps project undertaken with Forensic Architecture is one of many collaborations that Grupa Spomenik has undertaken and is based upon a unique methodology where "the group" does not constitute any fixed identity or collective, but rather a platform in which every new transformation has the potential to gather and empower different participants and associates. In 2010 the Working Group Four Faces of Omarska emerged from this platform, continuing to investigate the complex vortex of historical dynamics based upon the four faces of the Omarska site in Bosnia and Herzegovina.

AYESHA HAMEED is an artist and writer who is Joint Programme Leader in Fine Art and History of Art in the Department of Visual Cultures at Goldsmiths, University of London, where she is also a researcher on the Forensic Architecture project. Hameed's practice includes performance, video, and text, and examines borders, migration, and detention. Her essays have been widely published in journals and edited collections such as *Tate ETC.* (2010), *Photoworks* (2011), *Place: Location and Belonging in New Media Contexts* (2008), and *Sarai Reader* (2013).

CHARLES HELLER is a filmmaker and a researcher on the Forensic Architecture project whose practice has a long-standing focus on the politics of migration. His works include the documentary *NEM-NEE* (2005) on the condition of rejected asylum seekers in Switzerland, and *Crossroads at the Edge of Worlds* (2006) on Sub-Saharan transit migrants in Morocco, produced within the "Maghreb Connection" project (curated by Ursula Biemann). Between 2009 and 2011 he conducted the art and research project Image/Migration that critically examined the circulation of images of migration, from the field of human rights to that of the governance of migration. He is currently working towards a PhD in the Centre for Research Architecture at Goldsmiths, University of London on the politics of mobility at the maritime frontiers of the European Union. He is one of the founders of the WatchTheMed project, a participatory online map for documenting deaths of migrants and violations of migrants' rights at sea.

HELENE KAZAN is a multidisciplinary artist who uses research and archival material in her practice to generate moving image and multimedia installations. She has exhibited her work internationally. Most recently she participated in "Exposure" at Beirut Art Center, Lebanon, "It's Always too Late: Archiving the Anthropocene" at the Showroom, London, and had a solo exhibition "A Domestic Image of Preemption" at Lubomirov–Easton, London. She has presented her research at the IVSA 2013 Annual Conference: The Public Image, Goldsmiths, University of London, and at the "Images of Terror, Narratives of (In) security" international conference at the University of Lisbon, Portugal (2013). Kazan completed her MA in the Centre for Research Architecture at Goldsmiths, University of London in 2013.

THOMAS KEENAN teaches media theory and human rights at Bard College, where he directs the Human Rights Program and helped create the first undergraduate degree program in human rights in the United States. He is a research fellow on the Forensic Architecture project and coauthor, with Eyal Wiezman, of *Mengele's Skull: The Advent of a Forensic Aesthetics* (Sternberg Press, 2012). He is author of *Fables of Responsibility* (Stanford UP, 1997), coeditor, with Wendy Chun, of *New Media, Old Media* (Routledge, 2006) and, with Tirdad Zolghadr, of *The Human Snapshot* (Luma / Sternberg Press / CCS, 2013). He curated "Antiphotojournalism" with Carles Guerra (Barcelona and Amsterdam, 2010–2011) and "Aid and Abet" (Quebec, 2011). He has served on the boards of a number of human rights organizations and journals including WITNESS, Scholars at Risk, Crimes of War Project, *Journal of Human Rights*, and *Humanity*.

STEFFEN KRÄMER works as an independent video editor, cinematographer, and producer on individual and collective audio-visual projects. He has an abiding interest in experimental documentary and the essay film that relate to architecture and contemporary media fields. Krämer is a research assistant and lecturer in the Department of Applied Media Studies at the University of Cottbus (Brandenberg). He received a diploma in Communication in Social and Economic Contexts from the University of the Arts, Berlin, and his MA in Research Architecture at Goldsmiths, University London.

ADRIAN LAHOUD is an architect, teacher, and research fellow on the Forensic Architecture project. He joined the Centre for Research Architecture, Goldsmiths, University of London, in 2011 as director of the MA program; prior to this he was director of postgraduate Urban Design program at the University of Technology, Sydney. Currently he is leading the M.Arch Urban Design at the Bartlett, University College London (UCL), and is an external thesis adviser at the Projective Cities M.Phil. program at the Architectural Association (London). He exhibits and lectures internationally, most recently at the Harvard Graduate School of Design, Tate Britain, and Storefront for Art and Architecture (New York). He has been a guest critic at the Royal College of Art, London, Columbia GSAPP, Angewandte Vienna, and Technische Universität (TU), Berlin. His doctoral research sets out a philosophical, scientific, and architectural history of scale as a problematic, drawing on case studies of postwar urban planning, territorial governance, and climate modeling.

ARMIN LINKE works on a constantly expanding archive of human activity and the different forms of natural and manmade landscapes. He calls into question the boundaries between fiction and reality through the combined use of photography, film, and other visual media. His multimedia installations have been exhibited at the Venice Biennale and were shown as part of the film program at the Architekturtage in Graz, Austria. He is a professor at the Karlsruhe University of Arts and Design, guest professor at the Università IUAV di Venezia, and research affiliate at the MIT Visual Arts Program in Cambridge in the United States.

JONATHAN LITTELL is author of the novel *Les Bienveillantes* (Prix Goncourt and the Académie Française's Prix de Littérature, Éditions Gallimard, 2006), published in English as *The Kindly Ones*, as well as several other books. Previously he worked for the humanitarian agency Action Contre la Faim in Bosnia, Chechnya, Afghanistan, and the Democratic Republic of Congo.

MODELLING KIVALINA is a research group comprising artists and architects based at the Centre for Research Architecture, Goldsmiths, University of London. The group includes Andrea Bagnato, Helene Kazan, Daniel Fernández Pascual, Hannah Meszaros Martin, and Alon Schwabe. Modelling Kivalina was formed in 2012 when the group was invited by the Anchorage-based Re-Locate project to work in the Inupiaq village of Kivalina, Alaska. The research is funded in part by the World Justice Project, a Seattle-based organization that supports initiatives seeking to promote the rule of law. Modelling Kivalina aims to facilitate planning negotiations between residents and governmental agencies in Alaska through the use of visual techniques, in order to develop new ways of engaging with the issue of climate displacement worldwide.

MODEL COURT is an ongoing collaboration between Lawrence Abu Hamdan, Sidsel Meineche Hansen, Lorenzo Pezzani, and Oliver Rees that explores the shifting infrastructures of international justice. Exhibitions and events include "Resolution 978HD" at Gasworks, London (2013); "Model Court: An Ecology of the Courtroom," 21st Century program at the Chisenhale Gallery, London (2011); " A Thousand Eyes" symposium at the Henie Onstad Art Centre, Oslo; "Osloo" the Danish Pavilion at the 54th Venice Biennale, curated by Rio Bravo (2011); and "Model Court: An Ecology of the Courtroom" at CCA, Glasgow (2009).

GERALD NESTLER is an artist and researcher on the Forensic Architecture project who combines theory with performance, installation, video, and speech to interrogate financial derivatives and other finance-based narratives and their role in current biopolitics. Nestler lectures at Webster University Vienna and is completing a PhD in the Centre for Research Architecture, Goldsmiths, University of London. Recent projects include "The Trend Is Your Friend" (Kunsthaus Graz, 2009, with Sylvia Eckermann), "Declining Democracy: Rethinking Democracy between Utopia and Participation" (CCC Strozzina, Florence, 2011), "On Purpose. The New Derivative Order" (Kunstraum Bernsteiner, Vienna, 2012), "Glitch" (Kunstraum Innsbruck, 2013), and "Carry Cargo Cult" (Kunsthalle Wien, 2013). Selected publications include *Yx: Fluid Taxonomies—Human Derivatives—Vibrations in Hyperreal Econociety* (2007), *Kunstforum International*, nos. 200 and 201 (coeditor with Dieter Buchhart, 2010), and *What's next: Art after the Crisis* (2013).

ROBERT JAN VAN PELT has taught at the University of Waterloo School of Architecture since 1987, and has held appointments at many institutions of higher education in Europe, Asia, and North America, including the Architectural Association in London, the Technical University in Vienna, the National University of Singapore, the University of Virginia, Clark University, and MIT. He has published nine books dealing with diverse topics such as cosmic speculations on the Temple of Solomon, relativism in architectural history, and the construction history of Auschwitz. His more recent books include *At the Edge of the Abyss* (Northwestern University Press, 2012), *Flight from the Reich: Refugee Jews, 1933–1946* (Norton, 2009), coauthored with Deborah Dwork, and *The Case for Auschwitz: Evidence from the Irving Trial* (Indiana University Press, 2002). An internationally recognized authority on the history of Auschwitz, van Pelt appeared in Errol Morris's 1999 film *Mr. Death: The Rise and Fall of Fred A. Leuchter Jr.* and acted as a senior consultant to the BBC/PBS series *Auschwitz: Inside the Nazi State*. Van Pelt served as an expert witness for the defense in the notorious libel case Irving vs. Penguin Books and Deborah Lipstadt (1998–2001).

GODOFREDO PEREIRA is an architect and writer based in Porto and London, and a researcher on the Forensic Architecture project. His research "Underground Fetishism" investigates political and territorial conflicts within the planetary race to the underground, with a particular focus on the parallel exhumations of political leaders and natural resources as reimaginations of the body politic. Together with lawyer Alonso Barros he is coordinating the Atacama Desert Project, a geoforensic analysis of environmental violence in the Atacama Desert in Chile, in support of claims brought against copper companies by local communities and NGOs. He is also the coordinator of History and Theory at the M.Arch Urban Design program at the Bartlett, University College London; cofounder and editor of *Detritos*, a journal of art and critical theory; and editor of the book *Savage Objects* (INCM, 2012). He frequently writes on architecture, urbanization, and territory. Pereira graduated as an architect from FAUP (Porto), holds an M.Arch from the Bartlett School of Architecture and is a PhD candidate in the Centre for Research Architecture, Goldsmiths, University of London.

NICOLA PERUGINI is an anthropologist and assistant professor at the Al Quds Bard Honors College (Jerusalem, Palestine), where he directs the Human Rights and International Law Program. His past work focused on land rights, customary law, and historical dynamics of the reproduction of power and traditional dependence relations in Morocco. His current research investigates the colonial uses of human rights discourses and practices in the context of Israel/Palestine. In 2012–2013 he was a Member at the Institute for Advanced Study, Princeton, where he further developed his exploration of the relationship between human rights and domination, the subject of a forthcoming book with Oxford University Press. His publications also focus on embedded anthropology in Iraq and Afghanistan, asylum seekers in Italy, and spatial practices and control in Palestine. Since 2009, he has been collaborating on different research–theory–art projects with the Palestinian collective Decolonizing Architecture Art Residency (DAAR).

ALESSANDRO PETTI is an architect and researcher in urbanism based in Bethlehem, and is a research fellow on the Forensic Architecture project. He is the director of the program Campus in Camps at Al Quds University, an experimental educational program hosted in the Dheisheh refugee camp (Bethlehem) and director of the architectural studio and art residency DAAR (Decolonizing Architecture Art Residency), which combines discourse, spatial intervention, and collective learning. DAAR projects have been shown in various museums and biennales around the world. He has written on the emerging spatial order dictated by the paradigm of security and control (*Arcipelaghi e enclave*, Mondadori, 2007), and developed with DAAR a series of propositions for the subversion, reuse, profanation, and recycling of structures of domination and control (*Architecture after Revolution*, Sternberg Press, 2013).

LORENZO PEZZANI is an architect and researcher on the Forensic Architecture project whose work deals with the spatial politics and visual cultures of migration and human rights, with a particular focus on the liquid geographies of the ocean. Since 2011, his research has focused on a critical analysis of the militarized border regime and the politics of migration in the Mediterranean Sea. In collaboration with a wide network of contributors, the research has produced materials that challenge the regime of visibility in this contested area and provides tools for use in the struggle for the rights of migrants and for freedom of movement. He teaches at the Bartlett School of Architecture, University College London (UCL) and at Goldsmiths, University of London. His writings have appeared in various journals and edited books. He is also a member of the Model Court group and a cofounder of the WatchTheMed project. He is a PhD candidate in the Centre for Research Architecture, Goldsmiths, University of London.

CESARE P. R. ROMANO is Professor of Law and W. Joseph Ford Fellow at Loyola Law School, Los Angeles. Professor Romano has pioneered the study of international courts and tribunals. Between 1997 and 2006, he created, developed, and managed the Project on International Courts and Tribunals (PICT), a joint undertaking of the Center on International Cooperation, New York University, and the Centre for International Courts and Tribunals, University College London (UCL). In 2007, he became one of the directors of PICT. He continues to work on international courts and tribunals. In 2011, he became associated with iCourts and PluriCourts, respectively centers of research excellence at the University of Copenhagen and the University of Oslo. His most recent work is *The Oxford Handbook of International Adjudication* (Oxford University Press, 2014), coedited with Karen J. Alter and Yuval Shany.

SUSAN SCHUPPLI is an artist, writer, and senior research fellow and project coordinator on the Forensic Architecture project. Prior to working at Goldsmiths she was associate professor at the University of Western Ontario, Canada. She received her doctorate in 2009 between the Centres for Cultural Studies and Research Architecture at Goldsmiths, and participated in the Whitney Independent Study Program after completing her MFA at the University of California, San Diego. Her creative projects have been exhibited in Canada, United States, Australia, Europe, and Asia. Forthcoming exhibitions include Casino Luxembourg and Stroom Den Haag. Her written work has appeared in *Cabinet*, *Photoworks*, *Borderlands*, *Cosmos & History*, *Memory Studies*, and publications by Academia Press, Imprensa Nacional, Ciel Variable, Sternberg Press, Yale University Press, and Cambridge Scholars Press. She is author of the forthcoming book, *Material Witness: Forensic Media and the Production of Evidence* (MIT Press, 2015), which is also the subject of an experimental documentary.

FRANCESCO SEBREGONDI is an architect and research associate on the Forensic Architecture project. His research addresses the representation of spatially diffuse processes, the role of architecture as media, and the margins of contemporary cities. From 2011 to 2014 he was involved in the administration of the Forensic Architecture project and actively took part in several research investigations such as Living Death Camps, Drone Strikes, and White Phosphorus (which he coordinated). In 2013, he produced a series of maps and visuals of the world of international courts and tribunals on the basis of data provided by Cesare Romano and Karen Alter, published in *The Oxford Handbook on International Adjudication* (Oxford University Press, 2014). In 2011, he published the pamphlet *The Event of Void: Architecture and Politics in the Evacuated Heygate Estate*.

MICHAEL SFARD is a lawyer specializing in international human rights law and the laws of war. He has served as counsel in numerous important cases on these topics in Israel. Sfard grew up in Jerusalem and served in the Israeli Defense Forces (IDF) as a military paramedic. He was a conscientious objector and spent three weeks in military prison because of his refusal to serve in Hebron. He obtained his law degree from the Hebrew University in Jerusalem, after which he apprenticed with Attorney Avigdor Feldman and worked in Feldman's office for five years. During this period, he spent one year studying in London, where he completed a master's degree in International Human Rights Law at University College London (UCL). In early 2004, Sfard opened his own legal practice in Tel Aviv. Today Sfard is the legal adviser to several Israeli human rights organizations and peace groups (such as Yesh Din, Peace Now, and Breaking the Silence) and represents Palestinian communities (such as the village of Bil'in), and Israeli and Palestinian activists.

SHELA SHEIKH is a writer and editor, and research associate and publications coordinator on the Forensic Architecture project. She holds a PhD from the Department of History, Goldsmiths, University of London. Her research resides at the interfaces between Continental Philosophy, literature, and the visual arts, focusing on theories of testimony, the documentary, performativity, theatricality, media, sovereignty, politics, and ethics. Her doctoral thesis, "'I am the martyr (x)': Philosophical Reflections of Testimony and Martyrdom," offered a reading of the phenomenon of "martyr video-testimonies" of the Lebanon of the 1980s through the lens of the poetico-performatives of Jacques Derrida. She has been published in edited collections and by *Third Text* online. Since 2005 she has overseen publications at INIVA, the Hayward Gallery, and Antony Gormley Studio (all London). She lectures in the Department of Visual Cultures, Goldsmiths.

SITU RESEARCH was founded in 2005 in Brooklyn, New York. It has developed a model of practice uniquely equipped to explore a wide range of spatial issues—from mapping and visualization to full scale architectural installations. SITU Research is also strongly committed to interdisciplinary collaborations. Work done with a wide range of practitioners in fields outside of design including lawyers, activists, geologists, paleontologists and artists has resulted in unanticipated but exciting applications of architectural tools and methodologies to projects that extend into territory far beyond the traditional boundaries of architectural practice. The Studio engages in this work not only to explore novel and nuanced spatial problems driven by an entirely different set of objectives, but more importantly to seek new territory for the designer's role in politics, science, society, and the environment.

CAROLINE STURDY COLLS is lecturer in Forensic Investigation and Research Lead at the Centre of Archaeology at Staffordshire University. She is also a research fellow on the Forensic Architecture project. Her research focuses on the application of interdisciplinary approaches to the investigation of Holocaust landscapes and the need for a sub-discipline of Holocaust archaeology. As part of this research she completed the first archaeological surveys of the former camps at Treblinka (Poland), the sites of the slave labor program in Alderney (the Channel Islands), and the former Semlin Judenlager and Anhaltelager (Belgrade, Serbia). Her research at Treblinka extermination camp has recently received international media attention following the broadcast of a Channel 5 television documentary *Treblinka: Inside Hitler's Secret Death Camp*, and a BBC Radio 4 documentary *The Hidden Graves of the Holocaust*. Sturdy Colls is also a practicing forensic archaeologist and is a full member of the UK Forensic Archaeology Expert Panel and Member of the Institute For Archaeologists.

TERRITORIAL AGENCY was established by John Palmesino and Ann-Sofi Rönnskog, both research fellows on the Forensic Architecture project. Territorial Agency is an independent organization that promotes and works for integrated sustainable territorial transformations, combining analysis, contemporary architecture and urbanism, advocacy, and action. Projects include the Anthropocene Observatory, Museum of Infrastructural Unconscious, North, Unfinishable Markermeer, Kiruna, and the Coast of Europe. They convene Diploma Unit 4 at the Architectural Association in London, where they initiated the AA Think Tank on territorial transformations. Palmesino is researching for his PhD in the Centre for Research Architecture at Goldsmiths, University of London, where he also teaches on the MA. He has been research advisor at the Jan van Eyck Academie (Maastricht), previously led the research activities of ETH Zurich/Studio Basel – Contemporary City Institute, and he is a founding member of Multiplicity. Rönnskog has been a researcher at ETH Zurich/Studio Basel – Contemporary City Institute. She is a research fellow at AHO Oslo School of Architecture.

PAULO TAVARES is an architect and urbanist who graduated in Brazil and is currently based between Quito and London, where he is also a researcher on the Forensic Architecture project. Tavares teaches architecture at the Universidad Católica de Ecuador – Facultad de Arquitectura, Diseño y Arte, Quito, and has previously held teaching posts at the Centre for Research Architecture, and at the Visual Lab of the MA in Contemporary Art Theory, both at Goldsmiths, University of London. His writings have appeared in many publications worldwide and his work has been exhibited in various venues including Centre for Contemporary Arts in Glasgow, Haus der Kulturen der Welt in Berlin, Portikus in Frankfurt, and the Taipei Biennial. He is developing a project on the politics of ecology in Amazonia within the context of the PhD program in the Centre for Research Architecture, Goldsmiths.

FÜSUN TÜRETKEN is an architect, visual artist, and researcher on the Forensic Architecture project. From 2005 to 2008 she worked as a curatorial assistant and researcher with the project Shrinking Cities, in collaboration with Project Office, in Berlin. In 2008 she set up Studio ft., a platform for collaborative artistic research and work. The same year she was commissioned as director of the German Pavilion at the Architecture Biennale Venice. For two years she taught and worked at University College London (UCL). Currently, she is a lecturer at MIARD (Master of Interior Architecture and Retail Design) at the Piet Zwart Institute, Willem de Kooning Academy in Rotterdam. She is a PhD candidate in the Centre for Research Architecture, Goldsmiths, University of London. Her work has been exhibited at the Göteborg International Biennal for Contemporary Art (2013), Haus der Kulturen der Welt (2013), and the Architecture Biennale Venice (2008 and 2006). Her editorial and curatorial work includes *Urban Age Istanbul: City of Intersections* (2009), *Shrinking Cities*, *Urban Catalyst*, *Updating Germany – Project for a Better Future* (2009), and *Faith in the City* (2010).

SRDJAN JOVANOVIC WEISS is a New York-based architect and is as a research fellow on the Forensic Architecture project. He is the founding principal of NAO (Normal Architecture Office) and cofounder of School of Missing Studies. He is author of *Socialist Architecture: The Vanishing Act* (JRP|Ringier, 2012) with photographer Armin Linke, and *Almost Architecture* (Merz & Solitude, 2006). His designs include Villa 62 Ordos, China, curated by artist Ai Weiwei; Z-blocks, created for social interaction; and Hilltopia, a vision involving the creation of hills in Philadelphia to transform the vacant city into a common landscape. His curatorial projects include: "Lina Bo Bardi" at Columbia GSAPP, "Yona Friedman: About Cities" at the Drawing Center in New York, and "Anne Tyng: Inhabiting Geometry" at the Institute for Contemporary Art in Philadelphia and at the Graham Foundation in Chicago. He received a PhD from the Centre for Research Architecture at Goldsmiths, University of London for research on the Architecture of Balkanization, and masters degrees from Harvard GSD and the University of Belgrade. Jovanovic Weiss currently teaches at Columbia and Penn universities. He has worked with Herzog & de Meuron Architects, Richard Gluckman, and artists Jenny Holzer, Robert Wilson, and Marjetica Potrč.

EYAL WEIZMAN is an architect, Professor of Spatial and Visual Cultures, and director of the Centre for Research Architecture at Goldsmiths, University of London. Since 2011 he has also been directing Forensic Architecture as its principal investigator. He is a founding member (with

Alessandro Petti and Sandi Hilal) of the architectural collective DAAR (Decolonizing Architecture Art Residency), formed in 2007 in Beit Sahour, Palestine. DAAR has recently published *Architecture after Revolution* (Sternberg Press, 2013). His other books include (with Thomas Keenan) *Mengele's Skull: The Advent of a Forensic Aesthetics* (Sternberg Press, 2012), *The Least of all Possible Evils: Humanitarian Violence from Arendt to Gaza* (Nottetempo 2009; Verso, 2011), *Hollow Land* (Verso, 2007), and *A Civilian Occupation* (Verso, 2003). He has worked with a variety of NGOs worldwide, was a member of the B'Tselem board of directors, and is currently on the advisory board of the ICA in London. He studied architecture at the Architectural Association in London and completed his PhD at the London Consortium/Birkbeck College.

INES WEIZMAN is Junior Professor of Architectural Theory at the Bauhaus University, Weimar, and Senior Lecturer at London Metropolitan University. She was trained as an architect at the Bauhaus University, Weimar, the École Nationale Supérioeure d'Architecture de Belleville in Paris, Cambridge University, and the Architectural Association, where she completed her PhD thesis in history and theory. She is the editor of *Architecture and the Paradox of Dissidence* which will be published with Routledge in 2014. Her articles have appeared in books, magazines, and journals including *AA Files*, *Architecture & Culture* (Bloomsbury, 2014), *ADD METAPHYSICS*, *ARCH+*, *BEYOND*, *Displayer*, *Journal of Architectural Education (JAE)*, *Perspecta*, *Volume*, *The Sage Handbook of Architectural Theory* (Sage, 2012), *StadtHeimaten* (Jovis, 2012), *Agency* (Routledge, 2009), *Urban Transformation* (Ruby Press, 2008), and *Dictionary of War* (Merve Verlag, 2008). Her installation *Repeat Yourself: Loos, Law and the Culture of the Copy* was shown as part of "The Museum of Copying" (curated by FAT Architects) in the Arsenale at the Venice Architecture Biennale in 2012, and in 2013 as solo shows in the Architecture Center Vienna and the Buell Architecture Gallery at Columbia University, New York.

CHRIS WOODS is a London-based investigative journalist and filmmaker specializing in conflict and national security issues. For many years a senior producer with the BBC's *Panorama* and *Newsnight* programs, he established and led the Bureau of Investigative Journalism's drones team for two years. His reports for the BIJ helped challenge CIA assertions that civilians were no longer being killed by armed drones in Pakistan and elsewhere, while his investigation into the deliberate targeting of rescuers and funeral-goers by the United Stated-led UN experts raised concerns regarding possible war crimes. Awarded the Martha Gellhorn Prize for Journalism in 2013, Woods is presently finishing a book for Hurst, *Sudden Justice*, which examines the role and impact of armed drones across the War on Terror's many battle spaces.

WORKING GROUP FOUR FACES OF OMARSKA is a research, production, and performance group/platform engaged in an exploration of the strategies of memorial production from the position of those whose experience and knowledge have been subjugated, rejected, and excluded from public memory. It is an ongoing investigation of a complex vortex of historical dynamics based on three eras and four faces of the Omarska site in Bosnia and Herzegovina.

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