The Forensic Dilemma

"TRAGEDY ENDEAVORS... to confine itself to a single revolution of the sun." But to reconstruct the events of a single day, it is necessary, according to this schema in Aristotle’s Poetics, to understand the sets of values and beliefs that drove them, that is, to pull out their historical threads and reconstruct the world of which that day is part. At the culmination of what follows is a reconstruction of the events of two days: the killing of two Palestinian teenagers on Nakba Day, May 15, 2014—a tragedy that took place while commemorating another—in the town of Bituniya in the West Bank, and, a few months later, the events of August 1, 2014, in which the Israeli military manhunt of one of their own troops caused the deadliest incident in that year’s Gaza war in the strip’s southernmost city of Rafah.

To tell the story of these two separate, but related days requires movement between scales: it is in the details of those specific incidents that the longer shadows of the history of Palestine can be identified. Investigating specific incidents within a decade-long and ongoing history of colonization, domination, separation, and violence—a history so generously offered by the Palestine conflict—might otherwise seem futile: every day brings new violations and raises the pile of rubble even higher. Such outbreaks of violence are not interruptions of an existing peaceful order; they are endemic to Israel’s system of domination and are essential to maintaining it. The two investigations are reproduced here in nearly complete detail, not because they are more detailed or complex than other investigations I presented in the previous part of the book, but in order to give more complete examples of how our investigations are conducted and how they might interact with the existing political reality.

Before starting to engage with the reconstruction of these two separate days, this chapter will present shorter accounts of other investigations Forensic Architecture has undertaken in Israel/Palestine in recent years. The reasons for presenting this material are both methodological and political. Methodologically, this material seeks to demonstrate a shift between two distinct architectural approaches. The first looks at architecture as an
instrument of violation—of crimes committed on drawing boards and by buildings and infrastructure—a violence that is incremental, slow, and ever-present. The latter studies violent incidents—eruptive and kinetic events—in which the built environment has been a backdrop and a crime scene. While the former is concerned with the violence of architecture, the latter engages with violence that unfolds within it. In relation to the latter, such environments contain many eyewitnesses. They are saturated with both news media and media generated by those simply present at the events. Investigating events in such contexts involves cross-referencing multiple types of evidence: clips and images, material evidence and witness testimonies. We use architecture, or more precisely, virtual architectural models to create "evidence assemblages" that locate these elements in space and study the time/space relations between them.

Politically, this introductory material offers the possibility for reflection on the potentials, double binds, and limits of forensic architecture. Work in Palestine offers a good laboratory for such an undertaking. Indeed, as a political practice, forensic architecture seems to offer the kind of optimism expected of a pathologist. When we start our investigations, it is most often too late for many of those involved. The same applies to the practice's relation to the discipline of architecture: architects are trained to deliver new buildings; we get to study their last moments. Working in Palestine, we sometimes feel like coroners, investigators of a spatial murder—"spatioicide," in the words of Sari Hanafi, the murder of the landscapes of this country. This might appear to be a cause of despair or even an allegory of the state of the Left (and of architecture) today. True enough, but this does not capture the entire picture.

This part of the book is being written at a time of great political impasse. Racist tendencies latent in Israeli society and its institutions are erupting, with bloody consequences. Looking at the ground, it is hard to imagine a future other than further dispossession, settlements, and violent repression. In such a context, examining the pathology of incidents will not right the wrong. Still, we document the precise form and measure of atrocities in their full and explicit horror because we are determined to set down the reality of what is taking place. Confronting denial, in our context is more than just a historical reckoning with the crimes of the past in the context of "transitional justice," that is, with efforts to redress the legacies of past human rights abuses. No such transition has yet occurred. Confronting denial is important because denial, in all its multiple forms, is the condition of possibility for violence to be perpetuated in the future. What has been denied will go on being perpetrated, and sometimes charting the architecture of hell is the only possible response.

The following investigations bear testimony to the contradictory, but always entangled modes of denial: negation and justification. Underscoring all instances of the denial of local incidents of Israeli violence against Palestinians is the negation of the Nakba that is at the foundation of the state. Israel's official history never acknowledged the ethnic cleansing of the areas of Palestine that became Israel in 1948, a crime that was always perceived to be too grave to be casually recognized as a historical fact. As historical documents made this denial harder to maintain, justification was called on to join an incoherent cacophony of official contradictions: the land was uninhabited; people ran away to join our enemies; the ethnic cleansing of Palestine was a horrible necessity without which Israel could not exist; allowing people to return would bring an end to the state; and so on. As in Freud's famous parable of a neighbor having to explain why the kettle s/he borrowed was returned broken, arguments that "it never happened," "it didn't happen because of me," and "it had to happen" are employed simultaneously or in short succession, despite the contradictions involved.

The different ways in which Israel's legal system is part of the state's mechanism of domination and denial is something that others and I have written about at length. There are two separate legal systems in existence in the area occupied and controlled by the state of Israel, one for Israelis and one for Palestinians. The mandate of the military legal system, inasmuch as it deals with Israeli military personnel, for example, assigns criminal responsibility via the most narrow of frames and is thus oriented exclusively toward low-ranking soldiers: it investigates only harm caused by a breach of commands, never the legality of those commands. Because the system is inaccessible to Palestinians, if they want to press charges against soldiers, they must rely on human rights organizations to file complaints on their behalf. Military investigators pursue cases primarily by taking soldiers' statements, "subcontracting" human rights groups to obtain Palestinian testimonies, which the military later most often dismisses as biased. That the military legal system draws legitimacy from the fact that it collaborates with human rights groups demonstrates the danger of collusion all such groups continuously face. In reality, less than a third of a single percent of complaints lead to charges being brought against implicated soldiers. When it comes to Palestinians facing criminal charges in the military courts, the chances of conviction are mirror-inverted and have in recent years been 99.94 percent.
Despite this structural inequality, Forensic Architecture has worked to provide evidence for human rights organizations that doggedly sought to document and make public the facts of military violence and violations. We undertook commissions from bereaved families to analyze acts of killing, and from residents fighting land expropriation who sought, often desperately, to protect what little land they had when we estimated our research could support a larger political initiative. We believed that we could make public, in multiple forums, the physical violence perpetrated by state agencies, and could expose and denounce the violence perpetrated by the law itself.

Official Israeli spokespersons use the existence of such a compromised legal system to claim that the state does everything in its power to investigate and charge the criminal offenses of soldiers. Thus, international humanitarian law is bound by the principle of “complementarity.” The ICC, for example, is mandated to be a “court of last resort” that will step in only if states show themselves unable or unwilling to launch a process that addresses violations of international law. Prosecuting a few single cases is thus a useful way to support the claim that the national legal system is competent and willing to examine itself and that therefore international action is redundant.

In 2014, despite several “successes,” we at Forensic Architecture determined that withdrawal from the Israeli legal system is preferable to cooperating with it, that confronting Israel's regime of domination is better undertaken outside of the state's legal institutions, and that despite being compromised in other ways, international forums present a better chance for achieving accountability. We decided to no longer support legal cases or undertake forensic analysis on behalf of cases that are presented in Israeli legal forums except to deal with cases in the Israeli court system that we had already begun and remain committed to investigating to publicize Israel's violations and abuses in other forums.

Our forensics might be employed with a measure of hope, but certainly with no illusions: international courts, human rights reports, and UN commissions are not in themselves transformative platforms. They, too, need to be engaged with caution. We should be cautious that cases pursued in such contexts do not replace political and social processes with a stale, bureaucratic sense of justice. When we address such institutions, it is because this is part of a wider political strategy that includes other forms of civil action. Forensics, in this context, is only as good as the political process of which it is part.

ARCHITECTURE AGAINST ARCHITECTS

The practice of forensic architecture is not limited to the Palestine conflict, but its trajectory started there. Its origins are with a project that attempted to turn architecture against architects. In 2002, B’Tselem, the largest human rights group in Israel/Palestine, asked me—I was a recent architectural graduate at the time—to participate in the preparation of a report that would implicate the architects and planners involved in designing and building settlements in the West Bank as being in violation of human rights and international law. The preparation of the report necessitated a close reading of hundreds of urban and architectural plans, which were obtained from regional councils in the West Bank by logging freedom of information requests and through painstaking archival surveys in municipal planning offices. Although the settlements were present on the ground, their physical extent and form were not available from maps and drawings.

It was on the drawing boards, these plans demonstrated, that crimes were committed in the most basic gesture of architecture—lines drawn on paper. The violence performed on the drawing was later transferred to the ground. Such crimes against the landscape and people were intended to and succeeded in generating social and political harm—cutting apart communities, enveloping and isolating villages and neighborhoods, robbing cities of their open areas, landscapes, and water resources, limiting Palestinians’ ability to use and enjoy space or to move through it. This was part of a general policy that sought to encourage people to move away, indeed, to force them to migrate—it was ethnic cleansing architecturally performed.

I will not endeavor to tell the details of this story once more (it is available in Land Grab, the human rights report we published, as well as in Hollow Land, the book I wrote on its basis), but note that for reasons that are both technical and bureaucratic—judicial, our wish to see an architect in the dock of an international tribunal, alongside generals and politicians, has not yet been achieved. Still, the architectural evidence produced in this process was presented in several other contexts, trials, UN commissions, and in a case pursued by the International Court of Justice (ICJ) in The Hague. It was also presented in various civil-society initiatives against the Israeli regime of domination and occupation, such as the publication of the Palestinian Civil Society Call for Boycott, Disinvestment, and Sanctions, which, when it emerged, relied on the ICJ ruling. At the time, the project demonstrated both the violence perpetrated by architecture and the potential of architectural investigation and evidence to be used to confront it.
POLITICAL FORMS AND FORCES

This image is a segment from a map of the West Bank produced as part of a human rights report entitled Land Grab that I coauthored with B'Tselem. In the blue spectrum are the Jewish settlements, areas of their planned extension, and larger areas under their jurisdiction; in the brown spectrum are Palestinian-built structures and their areas of limited jurisdiction, demonstrating the astounding interplay of political forms to which the conflict has given rise. This is an elastic, almost viscous process by which territories are continually transformed, made and remade in response to force fields around them. The map is nothing but a freeze-frame shot in a process of ongoing transformations. If we could press “play” on this map, we might see events unfolding at different speeds. At the speed of a day per second, we could see the displacement of people, uprooting of trees, and replanting of fields on their ruins. The speed of a month per second would show the way settlements expand to bisect and envelop Palestinian communities, and at the speed of a year per second, we could see, in a duration shorter than a minute, the complete physical and environmental transformation that the West Bank has undergone since its occupation, the way small outposts grow and connect, the way the roads are built to serve only those outposts, as well as the slow drying out of all Palestinian-held areas as water is diverted for the exclusive use of the colonies. The fact that the map describes a complex interplay of material forms, rather than a homogenous blue (Israel) surface, means that resistance does have effects on the ground. Hence the double premise of forensic architecture: if form is the product of forces, something of the history of those forces can be read in an analysis of form. Conversely, it demonstrates that architectural form is an active form, able to mobilize forces and violently snap back.
"COUNTER-CARTOGRAPHY"

Edward Said wrote critically about the imperial use of cartography: "In the history of colonial invasions maps are always first drawn by the victors, since maps are instruments of conquest." In addition he advocated for a form of "counter-cartography" able to confront the geographically violence of European imperialism: "Geography can also be the art of resistance if there is a counter-map." He posited counter-cartography as a critical practice that confronts the epistemic violence of imperial maps. The range of such a practice extends from the psychogeo graphical representation of the daily lives of the oppressed and the charting of its multiple modes of knowledge production to the exposure of the spatial logic of domination, the removal of the privilege of mapping from the state.

The latter approach was manifested in Said's own attempt to map the realities on the ground.12 In December 2000, three months after the start of the bloody second Intifada, Said proposed that for too long the Palestinians had conceded the ability to map to the Israelis. "The Palestinians themselves have until recently been mapless. They had no detailed maps of their own." He subsequently promoted a "spatial turn" that would break Israel's monopoly over the representation of the terrain. This gave birth to a multiplicity of cartographic practices and led to the production of the map mentioned in the frame above.

That one of the strongest critics of mapping would also propose cartography as a form of resistance was surprising, but not contradictory. Unlike the colonial projects of recent centuries, the mode of operation of contemporary colonialism is to erase and cover up the traces of its own violence, to become so invisible as to no longer appear as power at all. To remove traces is also to erase the traces of erasure. Mapping is not only about plotting a carte built into a material reality, but about uncovering such acts of invisible erasure.

Several years later, with the increased availability of satellite photographs and the online proliferation of user-generated images, mapping became an image practice, and counter-cartography grew to embrace image analysis. While maps are able to deal with the slow architectural violence of settlement planning and construction, architectural image analysis provides an accelerated and focused form of cartography that has helped us bring our analyses to bear upon eruptive, kinetic forms of urban violence and reconstruct incidents unfolding at much faster paces and on smaller scales. However, these forms of violence are related; the seemingly benign environmental violence of the settlements can at any time erupt into instantaneous and spectacular violence. The settlements demand other forms of violence: roadblocks, walls, night incursions into cities and neighborhoods, the beating and often shooting of demonstrators, targeted assassinations, and bombing.

PRECEDENTS

Increasingly, with the penetration of cameras into the conflict zone, video clips documenting the killing of Palestinians have emerged. But the fact that clips existed did not always make a clear-cut case and shed conclusive light on incidents. Images and their absence have themselves become controversial and contested material that has needed to be analyzed, presented, and contextualized. I will recount two cases from a potentially very long list: in the first, the existence of video evidence was a contested feature, while in the second, the absence of video evidence was a determining factor.

The first major controversy was around filmed evidence surrounding the killing of Mohammed al-Dura, a twelve-year-old Palestinian boy shot in his father's arms near the Netzarim settlement junction in the Gaza Strip in September 2000 at the very start of the Second Intifada—he was later to become a symbol of Palestinian martyrdom. Al-Dura's killing was caught on camera and broadcast by a French television station with a voiceover suggesting the obvious—that he was shot by Israeli soldiers. Israeli officials disputed the report, some going so far as to say that it was staged and that al-Dura was still alive. A private French businessman undertook ballistic and video analysis, accusing French Channel 2 of using the footage in a manipulative manner, and dragged the case through the French legal system for years until finally losing it. In May 2013, not content with the end of the case in France, Prime Minister Netanyahu released a state-commissioned report suggesting that al-Dura had not been hit by Israeli fire and reiterated the claim that he may not have been shot at all.

The response to the killing of al-Dura demonstrated that without the independent ability to investigate, leaving the field of forensics to Israeli investigators reinforces their monopoly over the narrative of critical events in the same way that their control of cartography has reinforced their territorial rule. As the stronger side, with wide access to the terrain, to optics, and to the media, they will otherwise be able to determine the narrative, and given an opportunity to deny, they will always seize it.

The second of the two controversies concerns the killing of Jawaher Abu Rahma, Bassem Abu Rahma's sister, on the last day of 2011. (See "Abu
Rahma: From Video to Virtual Modeling,” pp. 108-13.) She died in a demonstration in Bil’in after inhaling tear gas, almost at the same spot her brother was killed two-and-a-half years earlier. The military proposed an astonishing barrage of contradictory explanations in its attempt to argue that Jawaher Abu Rahma died by forces other than its own: she wasn’t at the demonstration; she was stabbed in a family honor killing; she was diagnosed with leukemia, thus being abnormally susceptible to otherwise nonlethal tear gas. The fact that there was no video of her actually succumbing to and suffocating within a tear-gas cloud—because, as witnesses explained, those with cameras preferred to rush to her help—was used by the military to claim her killing was fabricated. In an era of omnipresent video, the absence of video can be used as “negative evidence”—helping to claim that the thing in question did not happen.

Both these killings were undertaken in the context of military action to protect settlements. Al-Dura was killed by fire originating from a military base established to guard the Netzahim settlement. Jawaher Abu Rahma was killed in a demonstration against the Wall, whose path on the land of her village was established to protect the Ultraorthodox settlement Mod’in Illit. The slow, architectural violence of the settlement project extracts constant sacrifices in fast, kinetic violence.

These killings and the controversies around them also echo violence unleashed by American police forces on black bodies. In recent years in such places as Cincinnati, Cleveland, Staten Island, Houston, San Antonio, North Charlotte, Chicago, and Baton Rouge, facts of such killings have been exposed by videos from security cameras, journalists, activists, passersby, or bystanders. In all these cases, it seems that today’s compulsion to take pictures of everything and install CCTV camera everywhere has reached its paradoxical apex with “Big Brother’s” tools turned around. Unlike the stylized violence of movies and computer games, these video clips are harrowing in the explicitness, ugliness, and sometimes clumsiness with which death is administered. They describe situations that are predictable but shocking nevertheless.

THE PYRAMIDS OF GAZA

The pyramids of Gaza, a forensic analyst once told me, occur as a result of an encounter between two elements common in the area: an armored Caterpillar D6 bulldozer and a three-story building, typical of refugee homes in Gaza. The bulldozer’s short blade can topple only the peripheral columns. The internal columns are left intact, forming the peak of the pyramid. The floor slabs break at their approximate center, then fold down and outward to form the faces of the structure. The geometry of the pyramids of Gaza is not as ideal as that of the pyramids of Giza. Their irregularities register differences in the process of construction—the uneven spread of concrete, for example—or in the process of destruction, whether a firefight or a tank shell struck the building.

The pyramid is but one of several typologies of destruction that can be told apart. The ruins that result from engineers placing explosives next to all major columns might end up looking like a series of floors “pancaked” over each other. Large air-dropped bombs with delay fuses break through all the floors of a building and blow up under its foundations. The remnant is a large conic crater into which the building has disappeared. Sustained artillery fire turns buildings into piles of rubble. Poke holes around windows designate a firefight. A tank shell fired into a building opens large round holes in the façade. 15
The first time I explicitly mentioned the term "forensic architecture" was in the context of critically engaged research into the potentially adverse effects of human rights and international law and their collision with military and state power. An essay in the journal Radical Philosophy titled "Forensic Architecture: Only the Criminal Can Solve the Crime" recounted the strange case of Marc Garlasco, Human Rights Watch (HRW)'s munitions expert. In 2003, as a Pentagon employee at the time of the invasion of Iraq, Garlasco was in charge of planning the targeted assassination of the state's Ba'ath leaders by bombing the multistory residential buildings in which they took shelter. Under the American interpretation of the legal principle of proportionality, he was tasked with limiting to twenty-nine the number of civilians expected to be killed in each of these strikes. The death of the thirtieth civilian would have been considered, by the standards of the Pentagon lawyers, the first one to be illegal or disproportional. But this calculation was about more than human lives. It needed to engage the structural characteristics of the buildings being bombed. To maintain "proportionality"—the acceptable number of casualties in relation to military objectives—the bombing needed to become an act of "design by destruction" in which only some building parts, a few stories here or a single side or wing there, could be removed and involved design calculations that combined blast analysis with structural engineering. After the war, Garlasco resigned from the Pentagon and was hired to work for HRW, where he was asked to undertake a similar, if reverse, kind of task—reconstructing, by studying the shape of ruins, the events that led to their destruction.

Garlasco's evolution from an agent of targeted assassination to a human rights advocate is a warning about the growing proximity between the human rights movement—it's principles, and the organizations advocating them—and the militaries they purportedly oppose and a reminder of the dark origins of some of our techniques and technologies of evidence gathering. The problem for Garlasco, however, lay elsewhere. After Israel's 2008-2009 attack on Gaza, he visited Gaza in the context of HRW's war-crime investigations and assembled important and effective evidence for Israeli war crimes there. He was forced to resign from HRW when pro-Israeli bloggers "discovered" (though Garlasco never hid that fact) to great media fanfare that he was a collector of Nazi memorabilia and thus allegedly a Nazi sympathizer unsuited to investigating the Israeli military impartially. The fact of his less-than-ordinary (for a human rights person) hobby I thought to be irrelevant—there is something of a fetishist in every forensic analyst seeking to read history from objects. He was certainly no Nazi, nor was he at all "anti-Israeli"—quite the contrary. This fact was merely used in order to attack his work on Israel.

LAWFARING

The significance of Garlasco's story is that in its extreme way, it offers an allegory to the paradox of forensics in a human rights context. On the one hand, it outlines the potential dangers of proximity and collusion between human rights analysis and the military that it seeks to oppose, while on the other hand, the fierceness of the antagonism he aroused due to his investigative work is testimony to the effectiveness of his forensic techniques.

The master's tools might not by themselves bring down the master's house, but taking them over surely had the potential to make him run mad. Perhaps the paradox describes two conditions that are not only related, but in fact interdependent and, as the subtitle for my essay on Garlasco in Radical Philosophy suggested, "only the criminal can solve the crime." Indeed,
Garlasco's suspension from HRW was one of the first shots in an all-out war that the Israeli government and its surrogates started waging against human rights groups.

Those completely dismissive of the potentials of legal activism should take into account the extent to which Western states perceive themselves vulnerable to such actions and the resources they invest in countering them. Israel went so far as to define international human rights, humanitarian, and legal action against it as a "third strategic threat," a close third after nuclear Iran and Hezbollah and on par with the BDS movement. Similar actions have been referred to by Western militaries and security think tanks as "lawfare," as discussed in Part I. 17

When international law protecting civilians stands in the way of state militaries, it is easy to see why military lawyers would also adopt the attitude of critical legal-studies scholars seeking to challenge "law's normative status" and to offer insights into its "indeterminacies and internal contradictions." This once led Michael Sfard to play on the name of the group Anarchists Against the Wall to describe Israeli military lawyers as "anarchists against the law," reflecting the ironic position by which activists on the Left now insist on the dry letter of the law.

In 2010, Danny Ayalon, then Israel's deputy foreign minister, argued that legal activism was one of the biggest challenges Israel would face in the years ahead: "Today the trenches are in Geneva in the Council of Human Rights, or in New York in the General Assembly, or in the Security Council, or in The Hague, the ICTY." That year, a report by the Ministry of Foreign Affairs took the accusation against legal activists a step further: "just as Carl von Clausewitz stated that 'war is ... a continuation of political activity by other means,' so too lawfare is a continuation of terrorist activity by other means." The paranoid comparison of human rights groups to terrorists, a comparison that sometimes leads to violence against activists, was made because Israel perceives international legitimacy to be essential for its perceived necessity to bomb in civilian areas. This is the reason why Israel severely restricts the entry of human rights groups and UN commissions into Gaza.

In recent years, the function of lawfare has been further complicated, with Jewish settler groups and other extreme-right nationalists adopting it themselves, mirroring the strategies of the very human rights groups they oppose. As Nicola Perugini and Neve Gordon have shown, these groups have taken on the mantle of human rights and started using techniques and vocabularies similar to those of activist NGOs in documenting, making claims, and arranging legal action against "Palestinian land invasion," "illegal construction," and "violence against settlers," and this in order to rationalize dispossession and justify violence. 21

These groups, together with members of the Israeli government and parliament, the police, and various semiautonomous right-wing groups, as well as most Israeli media, condoned campaigns on Left human rights groups and sent people to spy on, digitally surveil, infiltrate, incite, smear, harass, and arrest human rights and legal activists. The nonviolent civil action of boycotting Israel was made illegal, and a new law forced Israeli human rights activists to identify themselves as paid agents of foreign governments.

Living outside Israel, I was spared the worst of this treatment, but when Forensic Architecture's reports were published, they were attacked by such groups as the products of "a long-time anti-Israel and pro-BDS activist," and the British government, our partners and funders, as well as my university, have been reproached for helping me "advance my objectives" and "hire a number of fellow long-standing and obsessive anti-Israel activists." 22 Members of our groups have been detained upon landing at Tel Aviv airport, only to be sent back after a day or two of interrogations. Sfard has been spied upon by private detectives commissioned by a state-sponsored association. The detectives tried to gather information on cases, some of which we worked on, by going through Sfard's office trash. "I knew when it was cleaned, when the trash was taken out. I would argue with the guys on the garbage truck before they took away the trash. A day or two after, we were forced to tell the police when they finally investigated. 'From the trash, on more than one occasion we managed to rescue documents and torn pages and even shredded pages," he said. 23

Still, out of all those born in that land, Jewish Israelis like me are those most privileged by the regime. Unlike most Palestinians, we are able to travel through Palestine and outside it and are afforded greater latitude of expression and access to information. Being Israeli in this space, we cannot avoid a degree of collusion, even when we confront the regime, even when we migrate away, as I did. Unable to escape our privileges, we choose to use them against the regime that granted them to us and ultimately in order to undo them.

For Palestinians, the risks are far more acute. Palestinian journalists and citizen-journalists taking photographs of Israeli soldiers are arrested, beaten, and threatened, and their equipment is confiscated. Palestinian bloggers and even ordinary social-media users have been arrested for as little as posting their status on social media when expressing support for boycottting Israel. In August 2016, Amira Hass reported about "Black Ops"
being used against Palestinian legal NGOs. Nada Kiswanson, a Palestinian human rights lawyer working with the Palestinian human rights organization Al-Haq received anonymous murder threats over the phone for presenting evidence on the 2014 Gaza war to the ICC in The Hague. When, together with Amnesty International, a group from Forensic Architecture presented our own findings on the 2014 Gaza war at a press conference in East Jerusalem, we received unspecified death threats, including the following message: ‘I plan on visiting you with an M-16 very soon. Consider yourselves warned.’ We changed hotels at the last minute and hired a private Palestinian security company, but nothing transpired.

When soldiers invade Gaza, using cameras becomes extremely precarious — soldiers will shoot to kill anyone pointing a camera at them. The level of caution and risk in the use of evidence makes us sometimes refer to such acts as “forensic warfare.” This might demonstrate how contested the fields of human rights and legal activism have become, but can also invigorate them with a sense of renewed agency. The threats are proof that the public and legal actions that activists bring before international forums might be worrying those who should be worried.

Investigating incidents demands calm and systematic work that slows down time to examine minute details. It is hard to seek verbal and visual coherence when shock, rage, grief, and disbelief make one speechless, when the heart aches and the blood boils. People who risk their lives to take images and post them outside the space in which they are held under siege — as if they were messages in a bottle, without knowing if, who, and when their messages might be looked at — demand such attention, the closest attention we can muster. We must attend to these messages as carefully as we can, despite and perhaps because the content is hard to watch.

The Nakba Day Killing

In 2014, on Nakba Day, May 15, two Palestinian teenagers, Nadeem Nawara and Mohammad Abu Dahr, were shot and killed in the town of Bintuniya, near Ramallah in the West Bank, after a protest marking the sixty-sixth anniversary of the establishment of Israel. Forensic Architecture’s investigation of the Nakba Day killing was undertaken on behalf of a Palestinian NGO, DCI-Palestine, and the parents of the teenagers. It started with an attempt to identify the perpetrators of a double murder, but evolved to include an investigation into different modes of denial.

Significantly, because the events took place on May 15, the annual commemoration of the Nakba, the story is also haunted by that historical event — the Palestinian exodus of 1948. The “Nakba Law” that the Israeli parliament passed in 2001 imposed harsh fines on public organizations that refer to Israel’s “Independence Day as a day of mourning.” Every May 15, however, the Nakba is marked by protests throughout Palestine, from the Galilee to Gaza, the Naqab, the West Bank, and also abroad in Syria, Lebanon, Jordan, and other Palestinian diasporas. These protests often lead to clashes with Israeli security forces.

On the morning of Nakba Day in 2014, one of the flash points of protest was close to the Ofer military prison. After the main part of the protest was aggressively dispersed, witnesses heard three distinct gunshots roughly an hour apart. The first, at around 12:30 p.m., wounded Muhammad ‘Azzah, fifteen, with a shot to the chest. The second, at 1:15 p.m., killed Nawara, seventeen, with another shot to the chest. The third, at 2:58 p.m., killed Abu Dahr, sixteen, with a single gunshot to the back. All three teenagers were hit along the same patch of pavement, right in front of a small carpentry workshop.

Dozens of Palestinian teenagers have been killed or wounded by Israeli soldiers and other security personnel in the West Bank in recent years. Most of those killings took place off camera, responsibility was always denied, and a very small minority of them were even investigated. The bodies of Palestinian victims are buried hastily, often before nightfall, according to
Islamic laws and almost never with pathological investigation being undertaken. Children leave the house in the morning and disappear into the ground before sunset.

Unlike many other instances, on Nakba Day 2014, the killings were captured on multiple cameras. Footage relevant to the fatal shootings of both Nawara and Abu Daher was recorded by security cameras, by local and international media crews that came to cover the clashes, and by Israeli security personnel. The scene, unfolding in a confined space of several hundred square meters, resembled a film studio with multiple cameras, but no single director.

That the incident was most clearly captured by security cameras was not immediately appreciated by those reporting on the incidents. On May 19, four days after the shooting, while surveying the site for physical evidence, DCI researchers noticed CCTV cameras outside the carpentry workshop of Fakhre Zayed and asked him for the footage. Zayed was hesitant about passing it on, fearing military retaliation. Finally, though reluctantly, he allowed DCI to examine the files. Going through hours of material, DCI's researchers identified the relevant footage in four of Zayed's eight cameras. After receiving both Nadeem's and Muhammad's parents' permission, DCI posted short segments of this material online. The security camera footage is chilling. It shows both Nawara and Abu Daher walking casually and alone, unininvolved in any activity, when they are shown suddenly collapsing. The silent video makes the fall appear soft. For several seconds, the video shows the bodies remaining motionless, face down, then other people are seen rushing into the frame, evacuating the teenagers outside of it. The footage was picked up almost instantly and went viral on social media, gathering more than seven hundred thousand views. This resulted in condemnation of Israel from many states, from the UN, and from human rights groups. Even the Obama administration expressed its "concern."

There was another crucial bit of evidence available. After the funeral, Siam Nawara, Nadeem's father, received his son's backpack and other belongings. In the bag he found a 5.56-caliber bullet, the standard ammunition used by Israeli security forces. In a rare decision, given that Islamic law forbids such acts, Siam Nawara gave permission for the exhumation of Nadeem's body. The autopsy, conducted by Palestinian doctors and attended by Israeli and international pathologists, confirmed that it was the bullet that killed Nadeem and then left his body. In the meantime the indefatigable B'Tselem researcher/spokesperson Sari Michal was prominently working alongside DCI-Palestine to investigate elements of this narrative and to keep the story in the news.

In response, Israeli spokespersons stated that their "preliminary report concluded that there had been no live fire" and that the forces on site deployed only what they referred to as "non-lethal means," namely, rubber-coated steel bullets and tear gas, and further suggested that the "chances of fabrication were high." The minister of defense, Moshe Ya'alon, pursued the usual contradictory lines of explanation. In remarks delivered at an event in a West Bank settlement, he started by claiming that the Bituniya killings were the result of a violent encounter in which the teenagers killed were engaged in throwing Molotov cocktails at the soldiers, who felt at risk for their lives and acted appropriately. Referring to the videos showing that the youths were shot while unininvolved in any activity, he sarcastically added that he was "familiar with the ways such videos are edited," referring to them as malicious and fictional constructions of the growing cottage industry of "Fallywood" — a derogatory term by which Israeli spokespersons refer to "pro-Palestinian" user-generated evidence of killing as Palestinian Hollywood: the soldiers had to do it and they didn't do it, all claimed in a single breath. Israeli spokespersons
explained that the CCTV videos showing the boys collapsing were “ten-
dentiously edited.” A senior officer briefing journalists cast doubt on the
fact that the two were even dead. Michael Oren, former Israeli ambassador
to the United States, offered a live analysis in the CNN studio of the man-
ner in which the boys were seen falling—Nawara had his hands stretched
forward to soften his fall forward—claiming this was inconsistent with a
frontal shooting, which usually causes the body to drop backward. If he
was shot dead, he would also not have been able to stretch his hands for-
ward, Oren explained. In reality, Nawara died of his wounds in the hospital
a few hours later. Other spokespersons claimed that the youth seen in the
videos were not the same as the two boys whose deaths were registered.
A post by Danny Ayalon, another former Israeli ambassador to Washing-
ton, called for DCI–Palestine’s tax-exempt status in the United States to be
revoke because it was fabricating the truth. What was the truth? Israeli
security forces were seen filming the clashes, but all requests to examine
their footage were denied. It

The CNN footage at the moment of shooting.

The bullet head found in Nawara's bag measured to confirm it is
the standard IDF ammunition.
COURTESY OF DCI-PALESTINE
Synchronization: We started by synchronizing the relevant bits of footage from CNN and the CCTV cameras by identifying the same visual markers in both sources. The videos both ran at twenty-four frames a second. To find the overlapping frame, it was necessary to look for distinct shifts in the direction of movement of different characters. In both sequences, a man in a white shirt is seen running toward the ambulance. He makes two distinct turns. The first turning point allowed us to synchronize the videos and the second to confirm that we had done so correctly. The CCTV image on the left is magnified fivefold from the original.

INTERSECTIONS

In the Bituniya killings, the media attention and persistent Israeli denials led CNN producer Kareem Khadder, who was filming on site that day, to reexamine the footage he had shot. He realized that his camera had captured the moment of the shooting of Nawara from a crucial, different angle. On May 22, 2014, a week after the killings, CNN released the video. It showed a group of Israeli border policemen (an enlisted unit under police command, rather than military command, recognizable by their darker uniforms) and a single Israeli soldier aiming their rifles toward the place where Nawara fell. A border policeman and the soldier are seen shooting their guns toward the demonstrators. After recording the shooters, the camera pans to the right to show the evacuation of Nadeem Nawara. The sequence ends when an ambulance arrives at the scene.

Earlier that same day, May 22, three days after DCI-Palestine had obtained the security-camera footage from Zayed, Israeli forces raided his wood workshop and confiscated the security cameras and the computer hard disk on which the video files were stored. Two weeks later, on June 13, as the story gathered momentum, Israeli forces returned to confiscate all other CCTV cameras installed in the area, as well as the computer hard drives of their owners, returning them a few days later after copying all the footage on them. On June 17, Fakher was arrested, exactly as he had feared, and was taken to a nearby military base for interrogation, where other officers screamed at him for sharing the security videos with human rights groups and for “lying” and “fabricating evidence,” and threatened that if he did not remove the security cameras himself permanently and within twenty-four hours, they would “crush him” and unleash dogs on his children. “They told me that the video I gave to the press was fabricated, that everything I said and all my testimonies are a lie, that this is a serious violation of the law, and that I made the IDF look bad and caused a lot of problems.”

On June 6, 2014, three weeks after the incident, DCI-Palestine, working for the parents, commissioned Forensic Architecture to investigate the incident, which was still being denied. The main element in our investigation, which was coordinated by Nick Axel and included sound artist and investigator Lawrence Alan Hamdan, was to generate a virtual, architectural model of the site in which we could intersect and cross-reference all the videos and images, together with material and testimonial evidence, to help establish who shot Nawara and Abu-Daher. The result of our investigation, we insisted, should not be provided to the Israeli police, which was the same body that had perpetrated this act. DCI-Palestine would publically release our findings in response to developments on the ground in order to intervene in the process from the outside, with the aim of exposing both the crime and the shortcomings of the legal process.
Rubber-coated steel bullet. When the CNN camera (right) captured the second shot, fired by a soldier marked in red frame B, the CCTV footage shows Nawaz is already being evacuated. At the same moment, the CCTV footage (left) shows a cameraman, marked in red frame A, next to the helpers who carry Nawaz to the ambulance.

Incidentally, another photojournalist, Samer Nazal, took a high-speed, high-resolution photograph at that very moment from a different direction. His photograph shows the same cameraman at the same position and at the same moment as seen both in the CCTV and the CNN footage, marked in red frame A, allowing for nearly perfect synchronization of the three images above. Nazal’s photograph also captured an object in midflight before it hit and wounded the head of the Palestinian paramedic seen wearing a bright orange vest. It can only be a rubber-coated steel bullet—live munitions travel too fast to be captured on regular cameras. It is marked with red frame C and enlarged on the facing page. This allowed us to identify the sound signature of a rubber-coated steel bullet (acoustic trace).

Every gunshot makes its own kind of sound. Knowing the second shot (right) was the sound made by a rubber-coated steel bullet, rather than live fire, allowed us to compare the sound signatures of both shots. Lawrence Abu Handa, a sound specialist on Forensic Architecture’s team, processed the sound of these two shots through software that created spectrograms to identify their distinct visual signatures. The visual signature of the sound of live fire is distinct: it is louder than the sound of a rubber-coated steel bullet in the higher frequencies and softer in the lower frequencies.
MI6 rifle in operation. To determine whether the soldier had actually fired live ammunition through the rubber-bullet extension, it was necessary to examine the way an MI6 rifle works. When live ammunition is fired, it creates pressure high enough for the gun to eject the spent cartridge from the chamber automatically and reload. Above: MI6 rifle with extension. To fire a rubber-coated steel bullet, a blank cartridge is loaded into the rifle's chamber, marked A. The rubber bullet is manually inserted into the end of a special extension, marked B. The explosive power pushes the rubber bullet out, but because there is not the same amount of fire power in the blank cartridge as in a live round, there is not enough pressure for the gun to eject the blank cartridge automatically and reload. Reloading has to be done manually by cocking the gun in the area marked C.

An Israeli "firearms ballistic expert" pointing to the enlargement of the CNN footage showing the rubber bullet extension on a gun. This "expert," interviewed by Israeli TV Channel 1, claimed that the extension cannot be used for fire live ammunition. "The thickening that we can see here around the barrel is not intended for firing live ammunition, only for firing rubber (coated steel) bullets." The catalog for the rubber bullet extension's manufacturer, Israel Military Industries, disproves this statement. It advertises the possibility of shooting immediate live fire through it.
Spent cartridge ejected. Looking repeatedly at the footage, we could identify in three light-colored pixels—a bullet flying out of the gun, here marked in a red frame. This is the spent cartridge, automatically ejected, indicating that a live round was fired, not a rubber-coated steel bullet. If a live round were fired accidentally into a rubber-coated steel bullet loaded into the end of the extensor, the gun could explode. The sequence of actions thus had to have been carefully planned: both replacing the blanks with live ammunition and not loading the rubber bullet at the end of the extension. cnn

The shooter is seen cocking the gun. This could be consistent with the firing of a rubber-coated steel bullet, but given that the spent cartridge has already been ejected, the border policeman's previous actions are possibly an attempt to conceal from the CNN camera crew standing nearby or from anyone else watching that he previously shot a live round. Marked by a red frame is the unspent bullet dropping from the gun as a result of its cocking. cnn

Soldiers' blog. An online post is used by former soldiers describes a similar practice. This and another frame in the blog read: "When I was in Gaza, I met somebody that told me about a common trick...you shoot the rubber bullet and then you are left with the empty extension on the rifle. Then you shoot live rounds through the extension." In any case, "the Palestinians take the body, and there is no investigation, so who cares."
Spectrograms of gunshots captured by the Palestine TV camera. After the CNN camera crew left, another film crew from Palestine TV arrived on site. They were there when Abu Daher was shot. The camera did not aim at Abu Daher or at the border policeman. But it did capture the sound of the lethal gunshot. To help verify the source of this shot, we collected available sounds of gunshots captured by the same Palestinian TV camera throughout the day. Lawrence Abu Hamdan's spectrograms were used to compare their visual signatures. Clip A, fourth from the left and marked with a red frame, captures the sound of the lethal shot that killed Abu Daher. The difference between it and all other shots—rubber-coated steel bullets—is clear: as in the gunshot that killed Nawara, the sound of the gunshot that killed Abu Daher is louder than rubber-coated steel bullets in higher frequencies and softer in lower frequencies, suggesting Abu Daher was killed in a similar fashion by live fire shot through a rubber bullet extension. The still frame from the moment when Abu Daher is shot shows the protesters ducking for cover. Ramallah-based journalist Sameer Hijazi, who was at the scene, wrote that most participants in demonstrations can hear the difference between rubber bullets and live fire. Abu Hamdan explained: "These Palestinian teenagers can exactly identify a tiny distinction in the frequencies and react accordingly. Those are the real acute listeners in this case."—P A L E S T I N E T V

We kept working on this investigation all throughout the 2014 Gaza war. It felt odd to investigate the killing of two teenagers when more than five hundred Palestinian children were being killed, but it was our way to respect every young life lost. The first part of our analysis was delivered to DCI-Palestine in September, soon after the end of the war. The organizations used it in their approach to the UN and the US Congress, which led US Congresswoman Betty McCollum to call upon, unsuccessfully, the State Department to investigate whether this killing amounts to the violation of the "Leahy Law" that prohibits the United States from providing military assistance to foreign military units that violate human rights with impunity. It was a symbolic gesture, using the harshest language a US congressperson has used so far. No ban on weapons exports has, of course, been imposed.

On November 21, 2014, the police arrested a border policeman and identified him as Ben Deri. The bullet found in Nawara's bag was traced back to his gun. On November 23, 2014, Deri was indicted for the manslaughter of Nadeem Nawara and placed on house arrest. His home immediately became a site of pilgrimage for politicians and cultural figures. Demonstrations and social-media campaigns called for his immediate release, and demanded the government "unties the hands of the military." The indictment was rare—almost all other police and military killings of Palestinians are written off as self-defence—but the charge of manslaughter was insufficient.

We joined Siam Nawara, Nadeem's father, in claiming that his was a deliberate act of killing, a murder. A day after the charge was announced, we released a video refuting the terms of the indictment. Explaining the reduced charge, the police claimed that four minutes before he was shot, Nawara was throwing stones at the policemen. Our video showed that Nawara had just entered Deri's line of sight when shot. Deri could not have responded to anything Nawara was previously involved in. We also showed that negligence was extremely unlikely. For Deri, to unintentionally shoot a live bullet, a sequence of two distinct and rare errors would
have to have taken place consecutively. A live round would need to have mysteriously found its way into a special magazine reserved for the blanks he used to propel the rubber-coated munitions. Then, precisely when that bullet came to be fired, Deri would have also to forget to place the rubber-coated ammunition at the end of his barrel extension. Firing a live round at an object stuck within the barrel could make the gun explode. Further reducing the probability that this was an error, the sequence these two rare coincidences would have had to be repeated twice more: Muhammad 'Azah was wounded an hour and twenty-five minutes before Nawara and Mohammad Abu Daher was killed an hour and thirteen minutes after him in a similar manner at the same location.

The trial in the Jerusalem District Court was continuously delayed by the defence while pressure was building up on the witnesses and on Nawara’s family. In January 2017, Siam Nawara wrote to us to say that: “the defence and a representative of the Israeli government are putting pressure on me to sign a deal.” The deal, as we have shown, described an impossible situation: Deri agreed to admit to negligence and be convicted of a wrongful killing for unintentionally firing a live round “which accidentally fell into his magazine.” Your case is not famous anymore,” Siam Nawara was told. “it is not in the international media, nobody cares.” The plea was accepted by the prosecution without Nawara’s consent.

We have also released a video investigation about the killing of Mohammad Abu-Daher, which the media and the police have previously ignored. His family did not allow for an exhumation and there was no TV footage of the shooting to link them with the victim. It was only the sound of the shots that connected the two acts of murder: just like Nawara’s the shot that killed Abu Daher had the sound signature of a bullet fired through a rubber bullet extension. The police, predictably, claimed that there was not enough evidence on go on and closed the case.45

Investigating individual violations is a problematic matter politically: state representatives always start by denying all allegations. Whenever denial could no longer be maintained, they privatize the violation, place it in the hands of individual soldiers and render the state’s own violence legitimate and legal. Even in these rare cases, light punishment is the norm. It communicates to Palestinians that their arbitrary killing is acceptable and possible at any time. From our perspective, investigating the split seconds of single incidents must always seek to show how they might be embedded with the longer duration of the state’s systemic violence and include attempts to expose the state’s attempts at denial.46

Hannibal in Rafah

In the weeks following the fatal shootings in Bitunia, violence escalated throughout the West Bank. Israeli forces kept on firing live ammunition and rubber-coated steel bullets at youths, resulting in injuries to over a dozen other children. A reprisal for the killings was not long in waiting. Less than a month later, on June 12, 2014, three Israeli teenagers were abducted by Hamas operatives near a West Bank settlement. Israel launched a large-scale crackdown on Hamas infrastructure and personnel, killing eleven Palestinians and arresting more than one thousand, including many who had only recently been freed under the terms of a prisoner exchange deal in which a captive Israeli soldier in Gaza, Gilad Shalit, was released three years earlier.46 This deal had been controversial with settlers, and the massive arrest operation sought to placate them. The Israeli Air Force also conducted air strikes against “Hamas facilities” in the Gaza Strip. On June 30, the bodies of the three missing teenagers were found near Hebron. They had been murdered. The following day, a Palestinian teenager from Jerusalem was burnt alive as the cycle of revenge spiraled on. His killing sparked Arab protests throughout the West Bank. Rocket fire from Gaza continued. Israel escalated its bombing of the strip. Hamas sent an armed group into Israel through a tunnel. The group was intercepted, but the Israeli military decided to start an operation to destroy all the other known tunnels. On July 17, 2014, the Israeli military invaded Gaza.

In early August, as the war was still being waged, Amnesty International commissioned Forensic Architecture (the investigation was subsequently coordinated by Christina Varvia) to undertake a large-scale investigation of architectural destruction in Gaza.47 Five years after Marc Garlasco had undertaken the architectural analyses of war damage, we found ourselves in his shoes, but sought and, in fact, were compelled to do things differently. The conditions of investigation were indeed different. During and after the conflict, both Israel and the Egyptian authorities denied entry into Gaza to Amnesty International and our team, along with all other human rights groups and many journalists.
When the war ended, the scale of destruction became clear—the results were more devastating than previous rounds of conflict in Gaza. According to the Gaza-based Ministry of Public Works, twenty thousand tons of explosives killed 2,251 people, 1,462 of whom were civilians, destroyed 23,590 homes, damaged a further 150,000—almost a third of all homes in Gaza and three times the level of destruction caused by Israel’s previous invasion in 2008–2009—and generated roughly 2.5 millions tons of rubble.

If that was an extreme, yet familiar enough type of result, the difference was that the 2014 Gaza conflict took place in a different juridical, technological, and political reality from previous rounds. A mere three months earlier, in April 2014, the Palestinian Authority reluctantly conceded to Palestinian popular pressure and ratified the Rome Statute extending the jurisdiction of the ICC in The Hague over the occupied Palestinian territories, this in spite of Israeli warnings that joining the ICC “would be viewed as an act of war,” the United States and the European Union threatening to cut aid, and also the risk to Palestinian leaders from counterpetitions. That the 2014 war unfolded under the shadow of the court, as faint and blurry as this shadow was, given that the people of Gaza had few illusions about the way the ICC bureaucratic process makes it prone to geopolitical pressures, still energized the gathering of evidence. It also led to the formation of the Joint Documentation Unit, a coalition of Palestinians and NGOs whose aim was to prepare a joint submission to the ICC. The conflict also took place in a different technological space, with more widespread availability of smartphone cameras and access to the Internet in Gaza changing the nature of evidence and of the investigation.

After the 2008–2009 Israeli bombing there was little user-generated content online, and evidence had to be collected on the ground, well after the war, in 2014, one of the most important sources for understanding the unfolding events was material produced by the people living in Gaza on their own terms and made available on social networks almost instantly. As bombs and artillery started raining on the city, some of its inhabitants, as well as journalists and members of various organizations, took their cameras and started recording the events around them, often risking their lives in the process. They photographed from the streets, from windows, roofs, and balconies, sometimes before or instead of escaping, despite knowing that the Israeli military’s open-fire instruction is to shoot to kill anyone directing a camera at soldiers. More than producing evidence, they wanted to document and set the record straight regarding events around them. They wanted to believe somebody would look at the images. These were extremely
valuable documents, but each was only a partial view of a complex and multiparticipant event and had to be combined and cross-referenced with others to create the photographic space of the battle.

There was also a different kind of testimony that prominently emerged during this conflict. It was delivered by soldiers, members of an Israeli NGO called Breaking the Silence, which was founded in 2004 but became prominent around this war. Besides participating in the fighting, its testifiers/soldiers also see themselves as first-hand witnesses and speak out about human rights violations that were undertaken by them and by other soldiers next to them. Sometimes they make available photographs and video recordings on their own smartphones, or from small video cameras embedded in their helmets.

Breaking the Silence testifiers are both participants and witnesses, perpetrators and human rights activists (the organization defines itself as a human rights group). Their testimonies are ethically and politically distinct from the testimonies of the victims, not least because the organization leaves out crucial details about the context of the events described and submits the testimonies to the review of the military censor before publishing them. However, because they make claims against the military of which they are part, these witnesses gain much prominence and notoriety and provoke enormous contestation and vilification from the Israeli media, government, and general public. Together with the citizen witnesses of Gaza, the soldier witnesses have taken over the task of reporting on events from professional, sometimes embedded, journalists and human rights researchers.

RAFAH, BLACK FRIDAY, AUGUST 1, 2014

Given the volume of evidence, to undertake an analysis that synthesized all these sources and testimonies, we had to focus on one day. If a tragedy in the Gaza war extended across a single day, Friday, August 1, 2014, was certainly it. It was the deadliest in the 2014 Gaza conflict. What took the Israeli military a day to destroy (and will take the Palestinians a decade to rebuild, based on current pace and subject to current restrictions imposed on the importing of building materials) took our team a year to research—the time ratio of a day to a year demonstrates the duration and labor necessary in forensic work—though we managed to reconstruct only a little of what happened in the southeastern outskirts of Rafah, the southernmost city in the Gaza Strip, during these twenty-four hours.34
The tragedy of August 1 has to do not only with the exceptional death toll, but also with the logic of fratricide—the Israeli military man-hunting to kill one of their own, lest he fall prisoner in the enemy's hands—that determined the turn of events.

The contested territory that day was the subsoil. The city of Rafah is jammed between two borders: Israel's and Egypt's. Across and between these borders runs an extensive network of tunnels. It was for the purpose of destroying these tunnels that the Israeli military had invaded Gaza in the first place. On August 1, Hamas fighters captured an Israeli officer and dragged him into one of the last remaining tunnels, hoping to remove him from the battlefield and later exchange him for many of their own prisoners, as they had done with Gilad Shalit and in defiance of the fact that most of those whom Israel had released had been rearrested after the events that spring.

Determined to avoid negotiations, the implicit recognition that goes with them, and the potential release of prisoners, the military unleashed a secret command—the Hannibal Directive—that called for concentrating massive fire on the entire area in which the soldier was suspected to be. The events of August 1 thus involved an attempted fratricide by which Israeli soldiers tried to kill one of their own. The military denied this, claiming they did all they could to save the soldier. However, as the investigation we pursued showed, the events of that day added up to a manhunt. Even though the contested territory that day was the subsoil and the tunnels, the unleashed violence was mainly from the air. Nonetheless it was the surface of the earth, the layer where civilians struggle to live, that bore the brunt of the destruction.

On August 1, the fate of the soldier and of the civilians killed in Rafah were entangled. We concentrated on the events of that day because it described a unique situation—a world upside down, in which Hamas was trying to save the life of a soldier that his own military was trying to kill, an inversion that had the potential to depart from the mode of accounting incidents in Gaza and unsettle common binaries.

We collected close to seven thousand photographs and video clips extracted from Arab, English, and Hebrew mainstream and social-media websites such as Twitter, Facebook, and YouTube. Many images were sent directly from people in Gaza, as well as from Amnesty International and other human rights groups such as Al Mezan. The images showed different instances of carnage—civilians under attack, families escaping along the roadways holding white flags, bombs blowing up, tanks razing houses, artillery barrages, smoke plumes, bomb clouds, burned-out ambulances, and

more. Our task was to piece these sources together with other testimonies, bits of evidence such as hospital logs, ambulance data, and news reports, in order to assemble a narrative. We used spatial models to compose assemblages of evidence. Architecture here was not only the object of analysis, but an optical device with which to view separate elements of evidence and the relations between them. Our report, with Amnesty International, was submitted to the ICC, and we sat with the investigative team there for a day-long session to go through our evidence and methods.

THE TIMELINE

The day that was later to be known as Black Friday started rather well. Slightly more than an hour into August 1, at 1:18 a.m., an agreement, negotiated by US Secretary of State John Kerry and UN Secretary General Ban Ki-Moon, regarding a "72-hour humanitarian ceasefire" was reached. "This humanitarian ceasefire will commence at 8:00 a.m. local time on Friday, August 1, 2014. It will last for a period of 72 hours unless extended. During this time, the forces on the ground will remain in place," the resolution read. Israel consented because the military understood its mission in Gaza to be close to complete—all the tunnels that it knew of but one had been found and destroyed, and the top command sought to withdraw in order to reduce further risks.

It was supposed to be the beginning of the end of that war. But different interpretations—or, better, willing misinterpretations—of the ceasefire agreement were about to doom it and the lives of so many in Rafah. The Israeli Army claimed that during the ceasefire it would still continue to search for and demolish tunnels within the area it held, a strip of about two kilometers west of the border. Hamas said it had agreed to stop its cross-border rocket fire only "against Zionist cities and settlements" and did not agree to hold its fire against the Israeli military in Gaza. It later explained that it "cannot operationally cease fire against troops inside the Gaza Strip that conduct operations and move continuously. These enemy forces could easily come in contact with our deployed ambushed, which will lead to a clash." That is indeed what took place.

On the night of August 1—following the announcement of the approaching ceasefire—Ofer Winter, the commander of the Givati Brigade, in charge of military operations in the area, ordered his troops to find and destroy the last known tunnel that still eluded the army, southeast of Rafah, about two kilometers on the Gaza side of the border, before the ceasefire went into
effect. They frantically searched for it in an agricultural area of fields and small plantations. A few homesteads and greenhouses were scattered across the area, which was beyond the lines that the Israeli Army held at the time. In a testimony delivered to Breaking the Silence, a “junior infantry field officer in Rafah” described the following events:

The incursion occurred the night before the ceasefire. The entrance happened at midnight, and everyone knew that at 8:00 a.m. the next morning it would be over, apparently. We entered the area in order to destroy the entire tunneling infrastructure that still remains there. If you think about it, that really means every house and agricultural structure in the area. There was pressure to go in and finish the job very quickly… just to purposelessly destroy stuff to finish the job.57

Nabil Sha’ath, the former Palestinian prime minister, explained that “destroying tunnels is destroying houses” and claimed that about nineteen houses were destroyed during that night’s incursion alone.58 Heavy fire and bombing continued through the night. Medical staff in the Najar Hospital, the hospital closest to the area, reported that civilian casualties began arriving before dawn.59 Rockets and mortars fired out of Gaza were intercepted in Ashdod, with a few landing in or near the settlements across the border. Despite an aggressive search, the Givati forces did not find the tunnel before the ceasefire went into effect at 8:00 a.m. Shortly after that time, Palestinian civilians started returning to their homes in areas from which they had been forcefully evicted.60 In previous weeks, the military had warned people to leave every neighborhood in which it operated. This was not only because of humanitarian considerations—it made it easier for the military to operate in deurbanized areas and to consider every person who remained to be a combatant by definition. Moving people around was also part of Israel’s war strategy, a point of leverage over the population and its leadership.

Slightly before the ceasefire came into effect, at 7:30 a.m., according to Hamas’ version of events,61 or just over an hour after the start of the ceasefire, at 9:06 a.m., according to the Israeli military’s, a group of Israeli commandos patrolling on foot in search for a tunnel beyond military lines fell upon the hideout of a group of Hamas fighters. A short exchange of fire ensued, at the end of which two Israeli soldiers and one Palestinian fighter were dead. Another Israeli soldier, an officer, Hadar Goldin, was captured and taken into a tunnel. This was a local, tactical ingestion that the Israe-
lis feared could develop into a system-wide crisis with strategic repercussions that could change the outcome of the war. The capture of an Israeli soldier for the purpose of forcing prisoners’ exchange was long declared as the aim of “the resistance.”62

Much of the military narrative of the day was provided by the Givati Brigade’s debriefings (the “Givati enquiry”), a forum set up to draw operational lessons.63 The firefight, they said, occurred near a slender two-story-high cinder-block structure.64 The Israeli force divided into two groups of three fighters each. The commander, his radian, and another officer, Lieutenant Hadas Goldin, approached the structure directly, walking across a field of watermelons that would have been harvested if the war had not begun. The second group of three soldiers outflanked the building from

The scene of the firefight and the capture. Phìdias satellite photo, July 19, 2014. The photograph was taken 2:09 before the incident and describes the state of the site at the start of the encounter. Yellow arrows mark the movement of the Israeli soldiers. The circle marks the cinder block structure over the tunnel mouth.

The cinder block structure above the mouth of the tunnel. The photograph is attributed to an unnamed Israeli soldier. GLASS DATA. "FROM DEEP UNDER." NS1014 (A DOCUMENTARY SERIES: ACCESS PERSON. APRIL 20, 2015).
behind a large greenhouse slightly to the east. Just as the two groups were separated by the greenhouse, the command group was heard shouting for help. This was quickly followed by a blast and two sequences of fire. The Givati enquiry timed the firefight at 9:06 a.m. From bullet casings found on site, it concluded that the Hamas unit was composed of five or six members. 66 When the outflanking unit arrived at the scene, they found three bodies on the ground and initially believed them to be the bodies of the three soldiers. Hamas confirmed that its fighters were wearing Israeli uniforms and explained — in support of its claim that the firefight took place at 7:33 a.m. — that it must have taken the Israelis two hours to realize that the Hamas fighter wearing a military uniform was not a soldier. 67 Indeed, there was much confusion, and it was only at 9:30 a.m., according to the military, that the army realized that one of the bodies they had found was that of a Hamas fighter and that Goldin was missing. Winter screamed “Hannibal” over the radio, 68 possessed by the realization that what he feared most had indeed taken place, thus unleashing the operational directive that would set in motion the events of the day.

The difference in the time lines can be understood as each of the parties’ eagerness to cast blame for the collapse of the ceasefire on the other. Because Hamas fired the first shot, it wanted to claim that the firefight took place before the ceasefire. Israel was naturally eager to show that it was Hamas that violated the ceasefire. Palestinian witnesses had different versions: many claimed that the massive strike initiated by the invocation of the Hannibal Directive started shortly after 8:00 a.m., while others timed it after 9:30 a.m. Such diverging versions are common in war. We were unable to establish the time of the firefight independently, but our attempts to do so helped us develop the techniques of shadow and plume analysis that were important in reconstructing the events later that day. The parties might argue about who violated the ceasefire in time, but we could show, at least, that the violation took place in space: an Israeli unit proceeded into an area controlled by Hamas during a time when they claimed there was a ceasefire.

This fact was also complicated by the three-dimensional architecture of tunnel warfare, which renders unclear the meaning of “front lines”: Palestinian fighters could be under Israeli ones, and a tunnel mouth harboring some of them could exist within an area surrounded by the Israeli military during the ceasefire. Be the differences in accounts around the timing of the firefight what they may: shortly before 10:00 a.m., the time lines of both Hamas and the Israeli military coincided. Both sides agreed it was then that the massive attack on the city of Rafah had begun.

THE PRISONER’S DILEMMA

The Hannibal Directive is a secret IDF operational order designed to deal with the event of a capture of an Israeli soldier by an irregular armed force. Although the military has denied this interpretation, it is understood by Israeli soldiers and commanders that they are asked to kill a comrade during the process of capture before he can become a prisoner in the enemy’s hands. The issuing of the command must be understood in relation to the central function that capturing Israelis had played in the Palestinian armed struggle since the late 1960s. By hijacking planes or obtaining hostages by other means, Palestinian groups were attempting to force Israel into implicit recognition where none existed, into negotiations, although often indirect, and into the release of prisoners, most often hundreds for every captured Israeli.

At the time, Israel denied that there even was a Palestinian people. Out of this denial came others: it did not recognize the Palestinian Liberation Organization and other Palestinian groups as legitimate representatives of the Palestinian people. The armed wings of these groups were thus also not recognized as legitimate military forces. Captured Palestinian fighters were not granted prisoner of war status in line with the Geneva Conventions and were sentenced according to Israel’s criminal law. (After 9/11 and following the US example, some Palestinian prisoners — admittedly, only a few — were held in the limbo zone of contemporary warfare as “unlawful combatants.”) 69 Capturing Israelis entangled both sides in a knot that forced them to communicate and was often the only possible way by which Palestinian political prisoners could be released.

Whereas it was primarily civilians who were captured in the infamous hijackings of the 1960s and 1970s, starting with the 1982 Israeli invasion of Lebanon, soldiers were closer at hand, outside their fully controlled zones, and could be captured and taken away from the battlefield. In June 1982, three Israeli soldiers were captured by the Popular Front for the Liberation of Palestine-General Command (PFLP-GE), a splinter group of the PLO headed by Ahmed Jibril. In May 1985, after indirect negotiations, Israel and the PFLP arrived at a prisoner-exchange deal. In exchange for the soldiers, 1,550 Palestinian prisoners were released. Leading the civic campaign against the deal and the release was the national religious settler movement Gush Emunim, which saw it as a proof of the weakness of “secular-liberal” Israeli society and demonstrated publically and vigorously, sometimes violently, against it. 70 The deal was also controversial with many in the military,
who feared it would encourage further attempts at taking hostages and that Israeli civil society was too weak to resist the pressure of captured soldiers' families.²⁷

In 1986, when the Hannibal Directive was issued, the military was occupying the border region in southern Lebanon and engaged in a guerrilla war with Hezbollah and other armed groups, which also experimented, after the success of the Jibril deal, with the tactics of capture. Rumors that an Israeli command directive called for the killing of captured Israeli soldiers circulated from the start, but parts of the directive were not made public until 1995, and it was only in 2003 that the military censors permitted revealing its very existence.²⁸ Its content is still classified, but the following formulation, at the top of the directive, was made public: "the kidnapping must be stopped by all means, even at the price of striking and harming our own forces."²⁹ This confirmed that the military allowed striking their own, but it was unclear whether the captured soldier was being identified as the actual target or as acceptable collateral damage in vigorous rescue attempts. It is of course illegal both in Israeli law and under international law for a military intentionally to kill its own captive soldiers, because captive soldiers are not part of a fighting force that constitutes a direct threat—the only category that justifies killing in battle—regardless of how they might be instrumentalized by their captors.³⁰ In 1989, when an Israeli officer was recorded briefing his soldiers, he could not be more explicit about the meaning: "We no longer have in our language 'an IDF soldier was kidnapped.' We stop the kidnapping at any price, even if it means to target our soldier, we prefer our soldier to be harmed rather than in their hands."³¹ In 1999, with the IDF still in Lebanon, Shaul Mofaz, then chief of staff, explained why: "With all the pain that saying this entails, an abducted soldier, in contrast to a soldier who has been killed, is a national problem."³²

The terms "kidnapping," and in other places "hostage," in the language of the command, are used in order to delegitimize an otherwise legitimate military tactic on the part of the Palestinians. The use of these terms might also suggest that Israelis understand the capture of soldiers on a continuum with civilian hijackings.

After the controversy that followed the command's exposure, its language was softened. It clarified the principle that the killing of the soldiers can be only a "collateral effect" of attempts to stop the capture. However, all along, an "oral tradition"—common military parlance for commands whose practices are too controversial to be written down, but that represent a prevailing systemic practice—was maintained by which the captured soldier

was in fact the target of the operation.³³ Given that rescue was unlikely, the killing of captured soldiers, whether they were the target or collateral damage, was always the preferable outcome of the Hannibal Directive.

Although the military claimed that the Directive's name was randomly selected by a computer program, it is an apt one for a command that involves the killing of a captive. Hannibal Barca, the Punic-Carthaginian military commander, killed himself in 218 BC in order not to fall captive to Rome. "Let us relieve the Romans from the anxiety they have so long experienced, since they think it tries their patience too much to wait for an old man's death."³⁴ But thirty years earlier, the Punic Wars also saw a moment of Roman resolve when Hannibal sent representatives of the captured Roman survivors of his victory at Cannae to try to convince the senate to pay ransom for their lives, the senate, after a heated debate, decided to refuse, leaving the prisoners to their fate.

Different states deal with the capture of their citizens and soldiers in different ways. The Europeans and Japanese usually engage in secret prisoner exchanges or negotiate ransoms. The United Kingdom and the United States have publically declared that they will not negotiate or comply with captors' demands, and although they have not always strictly held to their declared policy, they have favored inaction and noncommunication when a rescue operation seemed impossible. "Hannibalism," in this context, is the most extreme action on the spectrum of options facing states after an act of capture. Its logic is to preempt any deal by actualizing the worst an enemy can do, thus undoing the logic of the threat. This demonstration of military resolve mirrors that of its enemies, who see themselves as invincible because they do not fear death.

The Hannibal Directive must also be understood in relation to the existence of an economy of exchange and not in situations when prisoners are taken for the purpose of the videographic spectacles of their executions. Regardless of the fact that such ritualized killings were never part of the vocabulary of the Palestine conflict, and were performed elsewhere, they were useful in order to make Israeli soldiers accept that their killing by their comrades is a less evil, a form of euthanasia, perhaps, in the same way that members of colonial expeditions preferred death to being captured by people they called savages and cannibals.³⁵

French Philosopher Gregoire Chamayou has proposed that in recent decades, conventional warfare, with its "fronts, linear battles and face-to-face opposition," has been replaced by the tactics of the manhunt. "The structure does not involve two fighters facing off, but something else: a
hunter who advances and a prey who flees or who hides. Charnayou is mainly referring to the counterterrorist tactics of assassinating suspects by drone strikes. Hannibalism, in which the military hunts one of its own, is at once a radicalization and recategorization of this doctrine. The hunted is not an enemy but a friend.

The logic involves what military game theorists call a “repeat game”—every action is evaluated in relation to long-term possibilities. The employment of actual violence in the present (killing a single soldier) is evaluated in relation to the potential violence it might prevent in the future by deterring further attempts, leading, theoretically, to less violence in the long run.

The death of the soldier, however, is not the only one anticipated by the Hannibal Directive. “The massive fire strike over the entire area of capture,” in the words of the command, is expected to kill civilians. Military lawyers justify civilian deaths by determining that they were “proportional” to military aims. But high levels of civilian deaths and destruction are in fact essential for the maintenance of military deterrence. It is hard to deter a committed guerrilla force, but harming civilians, as Israel has done in Gaza and Lebanon in recent years and has threatened to continue, has been used as a leverage against the civilian base of popular resistance. Such deterrence is of course the hallmark of state terror. Ofer Winter, who unleashed the Hannibal Directive on the morning of August 1, explained the massive use of fire that killed about one hundred and twenty civilians as a kind of tutorial in fire: “They simply messed with the wrong brigade.”

Proportionality is a legal instrument used to measure the level of civilian casualties that the operation might legitimately bring about. It is a controversial category in international law because it makes legitimate anticipated damage to civilian life and property by balancing it against military objectives. The principle, formally codified in international law only in 1977, 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 not about clear lines of prohibition, but rather about calculating and determining balances and degrees. The more the military task can be presented as crucial, the more civilian casualties the principle is willing to tolerate.

In the case of Hannibalism, the logic of proportionality took on an extraordinary form. Against the conventional understanding of the principle, Israeli military lawyers put forward the argument that the level of civilian damage—that is, the number of dead civilians that military planners could find acceptable—should be measured against the danger of a possible release of prisoners. In other words, the military measures the carnage and destruction it allows itself to produce against risk that would come from its own actions—from the release of prisoners, not the capture of its soldiers.

Hannibalism thus mobilized different economics, or better, necroeconomies, of calculation, the currency being death, each with different mechanisms to measure the changing values of life and risk. One calculated the cost of the life of the captured in relation to that of the prisoners, while the other calculated the cost of the lives of “enemy civilians” in relation to the projected risks of releasing prisoners. The existence of such economies inevitably bring to mind the history of human trading, of slavery and colonialism, with the paradox being that by establishing the “exchange rate,” the captors reinforce the perception that a life of one of the dominating is worth as much as many of the lives of the dominated. There is a crucial difference, though: in colonial history, similar exchange rates were indeed imposed, but significantly, they were imposed by the dominators. From the perspective of the Palestinian armed groups, the demand for an unequal exchange takes place in a situation that is asymmetrical to start with and on terms least convenient for their dominators. Thus, in 2001, when Shalit was exchanged for 1,027 Palestinian prisoners, it was the Palestinian armed groups that established a benchmark exchange rate for future deals.

Furthermore, the preemptive power of the Hannibal Directive is not aimed at the enemy alone—after all, they could have been left to do with the captives as they wish—but rather at Israeli society, which the military always saw as too weak to withstand the pressure to release prisoners. Indeed, whenever an Israeli soldier was captured, his family, friends, and supporters took to the streets and started campaigning for their release, until, most often, the government acquiesced.

It was the settlers and the national-religious movements that were the most adamant critics of such deals, including the deal for the exchange of Gilad Shalit. On August 1, 2012, it would be the Givati Brigade, the unit most closely associated with the national-religious and settler movement, that had a chance to demonstrate a decisive alternative to such exchanges. Givati infused its soldiers with a religious consciousness that promotes self-sacrifice. At the beginning of the war, the brigade’s commander, Ofer Winter, called the invasion a religious war “on the Gaza enemy who blasphemes against the Lord” —a kind of Jewish jihad. In recent years, such religious sentiments have become manifest throughout the military, affecting military decisions and actions on the battlefields. It is a useful framework for
the military because it allows it to steer soldiers' resolve to engage in ongoing occupation and domination without the self-questioning that human rights frames could otherwise encourage.

HANNIBAL UNLEASHED

Although the military acknowledged that Hannibal was invoked over the radio, in the months following the war, it denied that the Hannibal Directive was put into effect, and more so that the military tried to kill the captured soldier. Contrary to those claims, the account that follows demonstrates that what took place on August 1, 2014, was in fact a manhunt in which the military sought to resolve its "prisoner dilemma" by killing the prisoner and that this resulted in death and destruction brought on civilians in Rafah.

An "infantry officer" described to Breaking the Silence the events that unfolded after the invocation of the Hannibal Directive was heard over the radio:

The минут "Hannibal Directive" is called on the radio, there are consequences. There's a fire procedure called the "Hannibal fire procedure"—you fire at every suspicious place that merges with a central route. You don't spare any means. A thousand shells were fired that Friday morning, at all the central intersections. . . . After the area was hit by 1,000 shells that Friday morning, I saw Tancher [military code for the main north-south Gaza artery—Salah al-Eddin Street] in ruins. Everything totally wrecked.88

An "artillery soldier" testified that his battery was "firing at a maximum fire rate" right into inhabited areas.87 The Givati enquiry confirmed that more than two thousand bombs, rockets, and shells were fired during the day, one thousand in the massive fire strike in the three hours following the announcement of Hannibal.89

Invoking Hannibal is a way to bypass the military hierarchy: The commander on the ground—in this case Winter—was able to call in artillery and airstrikes without the necessity for authorizing strikes being slowed down by having to pass through the hierarchy of central command. The fire strike caught thousands of disoriented civilians in the open along the routes of eastern Rafah. Some were returning home because of the cease-fire, while others were escaping from the strikes now being unleashed. It was hard to know where to go for safety. One of the survivors of this strike, Saleh Abu Mohsen, described it thus: "People were running away

Abdul Rahman Lafi returned to his home in the neighborhood of Al Tahar with his two sons shortly after 8:00 a.m.88 "My son Yousef and I left the house. We reached the Abu Yousef al-Najjar roundabout when the first rockets fell ahead of us by about 3 meters. I fell and was injured in my right leg. When I looked next to me I found my son. He looked up at me for seconds and died immediately after. When the first missile fell, two women to the right on the road toward Abu Yousef al-Najjar roundabout died." 88 Abdul Rahman Lafi points out the location of the strike to an Amnesty International researcher. Right: Traces of a missile on the pavement of the route traversed by Lafi. KENT ALCO/FORENSIC ARCHITECTURE AND AMNESTY INTERNATIONAL.

The first video we obtained was taken outside the Al Najjar Hospital looking south along the Al Najjar road. The metadata puts it at 10:22 a.m. The clip shows columns of dust raised by artillery fire a few hundred meters away, near the Al Najjar roundabout. This video was taken at the approximate time that Lafi was making his way to the hospital with his dead son. Both images contain stills from the video placed within a 3D model in order to establish their exact location.
from their homes in terror. It was a scene reminiscent of 1948, which we had only seen on TV. People were barefoot, women were running with their heads uncovered—it was a very difficult scene.\textsuperscript{89} Other witnesses described the sky full of jets, drones, and helicopters. The Israeli military, suspecting the captured soldier might be among these people or in cars or ambulances that took the wounded away, declared a large area of eastern Rafah a "closed military zone."\textsuperscript{90} Israeli helicopters were hovering over the main intersections like aerial checkpoints, reinforcing the siege by continuous fire aimed at anything on the roads. Cars, ambulances, trucks, and motorbikes were torched by missiles; pedestrians were torn by artillery.

Assuming that the captured soldier was wounded, the military suspected that he would have been taken to the Yusef al-Najjar Hospital, the one closest to the area of capture. This small hospital was also the main destination for the dozens of wounded and dead and their families. Shortly after the fire strike began, the hospital had reached a breaking point. The morgue was overflowing, and some bodies had to be sent to a vegetable wholesaler's refrigerator for storage. Dr. Ashraf Hijazi, head of the hospital's surgery department, recalled that "an officer from the Israeli intelligence services called a nurse at the hospital, said that the missing Israeli soldier was in the hospital and that we wouldn't be allowed to leave the hospital until we released the soldier. This was absurd." Rockets started falling near the doors of the hospital. At 3:30 p.m., the patients started fleeing the hospital. Another doctor recalled: "some had plaster casts, with drips in their chests and stomachs. I saw a young boy in a plaster cast crawling trying to flee by dragging himself along."

Shortly before 11:00 a.m., several columns of tanks, armored personnel carriers, and D9 bulldozers started charging toward the areas they suspected to harbor the tunnel, about two kilometers north of the point of capture. It was an area of low-density housing and some agricultural installations, just north of Salah al-Eddin Street. In the area was also the Sa'd Sayel military base, a Hamas training facility that was evacuated throughout the war.

Dovely Ohayon, a Givati soldier who participated in the ground assault, describes the situation in an entry in a diary he kept throughout the war: "The air force, tanks, artillery, engineering, machine guns, all the IDF fire power was there.\textsuperscript{91} The D9 bulldozers moved at the head of the columns, uprooting trees, demolishing buildings in their path, and piling up earth mounds to mask the movement of the infantry that followed them. Another soldier recalled: "a crazy amount of artillery was fired, armored D9 bulldozers plowed the entire area. After them the tanks moved in two lines, continuously shooting at houses as they moved along."\textsuperscript{92} The tank crews were ordered to shoot at any building, car, or structure along the path of movement, as well as at any structure overlooking their route. Massive fire aimed to reduce the risk to the soldiers at the expense of civilians who were still present across the battlefield. The armored vehicle in which Ohayon rode stopped for a long pause just south of Salah al-Eddin Street (the "Tancher route") while the D9 bulldozers and deminers were blasting new routes through previously built fabric and flattening buildings. Ohayon noted in his diary the unbearable heat: "it was 99 percent humidity inside the vehicle... fire burning everywhere outside." It was also the first day of a desperately hot August, the hottest recorded to date. His comrades in the armored vehicles were shooting nervously in all directions.

When the D9s completed their work, the infantry was ordered to charge into the burned and almost completely destroyed neighborhood. Ohayon described the scene: "everything was completely on fire, I never saw such complete destruction, almost every building in this neighborhood was hit.\textsuperscript{93} In all, 2,201 houses were destroyed completely or partially that day, 42 percent of them homes.\textsuperscript{94}

When approaching a house, a tank would first fire shells at the building. Then, covered by the tank's continuous heavy machine-gun fire, soldiers
would approach and fire a portable antitank rocket at a ground-level wall to produce a large hole. They then would enter the house through this hole, avoiding the doors and windows, where they could be expected. Before entering individual rooms, they would throw in grenades, regardless of there being civilians inside.

A military officer explained that "the motto guiding lots of people was, 'Let's show them.'" Other soldiers reportedly said that they came "to settle scores," to "extract a price," or to "let out steam." The soldiers wrought so much destruction that Eli Gino, Givati's deputy commander, was heard screaming over the radio: "Stop shooting! Stop shooting! You are shooting like morons, you will kill each other, STOP!" There was hardly any return fire. Winter later said: "I hoped they [Hamas] would come face to face with us, but they chickened out.... That's not combat. There were very few places where there were fighting retreats. They left everything and escaped."

If there was no resistance, what could justify the level of fire the military used?

Twenty-year-old Mohammed Abu Duba's describes what happened as seen from his home, one of the houses in the area. He heard the sounds of tanks clearly as if they were next to our home. From far away, approaching. They struck the house and I no longer saw what was happening as we hid under the stairs. ... The tanks were right next to our demolished house, one side of the tank touching the fallen masonry of our home, and continuing to bombard. And another in our street, one behind and one in front of the Mashrou' Amer [roundabouts].

Munir went up to the roof — without of course our father knowing — and he began to count the flags on top of the tanks. They numbered about thirty-seven and more just in ... our area. Sometimes they fly above the roof. They were just the ones we managed to count before fleeing. We counted and came straight back down. We weren't going to stay up there. He told me and my father and we went up to the roof. And sure enough. There were so many tanks. For every street, at least four or five tanks. And each one was bombarding the homes and people — wherever there were people. ... The tanks were coming from everywhere, from every street as if in shifts: five would leave and another five would take their place going round and round. ... We went up to the rooftop and saw the bulldozers from far away demolishing buildings one by one. And one of them was coming toward us. The tanks had [began to move] but the bulldozer was coming toward us. My father said we're going to die. If we die, we die. ... So we all got into the car. All of the window glass was smashed. We all got in with our belongings. ...
IMAGE SPACE

To reconstruct the events of the day, we needed to study the relation between the close to seven-thousand photographs and video clips that we had collected and received. When extracted from social media websites such as Twitter, Facebook, and YouTube, the metadata that could have helped us establish the time and location of these sources was no longer available. In the absence of digital time markers, we searched the images for analog time indicators—things we referred to as “physical clocks.” The most common of those were shadows. Shadows contain information about the location, orientation, and time at which an image was taken. We thus tried to match the shadows visible in images with simulated shadows that we generated in our modeling software. We used the three-dimensional model of the city as a virtual sundial to match the shadows found in images.362

Locating the images in space was most often undertaken by finding recognizable features in the image. After locating an image in space, we would orient the camera’s point of view by matching its cone of vision with simulations of eye-level perspectives extracted from the model of the city that we constructed.

Placing all images and clips within the model one by one, we gradually turned an image archive into an architectural-image complex—a space-time relation between multiple sources. The relations between a large multiplicity of images made viewing spatial. Navigation between one image and the next takes place by moving through this image space, a space that is both virtual and photographic. The model, in turn, became an optical device to establish and view images and the relations between them.

The margin of error in determining time by undertaking shadow analysis depends on proximity. If the shadows in the image are relatively close to the photographer, the margin of error in determining the time can be as small as five minutes. We referred to this margin of error as “time resolution”—as if the time line would be composed of time units five minutes in size that are analogous to the pixilation of images. Whenever the shadows captured in the image were farther away from the photographer or when, as happened closer to noon, with the sun high in the sky, they were considerably shorter, the time resolution increased to half an hour—sometimes even an hour, a time span no longer useful for our purposes.

*Excerpt: At 11:39 a.m., a European Pleiades image satellite passed over Rafah, capturing a multispot photograph of the city before continuing over the Mediterranean at a ground speed of ten kilometers a second. It would return over the same spot only on August 14, ten days after the Israel military retreated from the Gaza Strip. The image provided a last snapshot of the battle at a resolution of 50 centimeter per pixel. Operated by a European consortium and available since 2012, the Pleiades satellite is not bound by the same restrictions as US image satellites—which otherwise hold a near monopoly on the satellite image market—on providing high-resolution images of Israel and the Occupied Territories. In the Pleiades images, buildings and landscape features come into focus, although people remain below the threshold of detectability. The Pleiades photograph provides a rare snapshot of a city under attack, capturing multiple simultaneous incidents. Of this image we located incidents, cameras, and the cones of vision of their photographs and videos, smoke plumes, bomb clouds, and the location of witnesses and incidents.
1. Israeli tanks and D9 bulldozers along Salah al-Eddin Street. The smoke plume of burned trailers at the Mashrou' Amer roundabout confirms Moshen's testimony. About an hour after the ceasefire came into effect, he returned home with his three daughters. They found it partially destroyed and started to clear up the rubble. At 11:00 a.m., shortly after hearing a massive explosion, they decided to leave. They ran toward Salah al-Eddin Street, a few minutes away (their path is marked in blue). When he got there he was surprised to find a trailer on fire. "I found tanks in front of the Saladin Sayyel barracks. The tanks fired at us. I took two of my daughters and my third daughter stayed with the wife of a neighbour. When crossing the Mashrou' Amer intersection, I looked behind me and did not see my daughter [Ariel]." He found the body of Ariel next to the roundabout four days later. The satellite photograph was taken about half an hour after the incidents but it is likely to be the same tanks that killed his daughter.

2. At precisely the same time, a bomb cloud rises over a neighborhood north east of the area. Because the metadata on the satellite image is precise and available, we could establish the time of all photographs (ahose metadata was not available) that captured the same cloud from the ground.

3. Fire and a thick smoke plume from a bombing raid that took place about an hour before the photograph was taken. The area, as I will later show, was suspected to contain the mouth of the tunnel into which Lieutenant Goldin was taken, and this fire is the result of attempts to collapse it.

4. The impact craters from artillery shells and air strikes are recorded as vegetation loss by studying vegetation vigor (NDVI). A bomb destroys all organic life next to it, including small plants not always visible to the naked eye. Such craters and burn marks can be seen all along the roadways and around the major intersections in eastern Rafah.

5. The location, according to Salah Abu Mohsen, of the body of Ariel Abu Mohsen, his daughter. At a resolution of 0.5 meters per pixel, her body cannot be within any two pixels. This image shows the limit of detectability from space.
6. Identification of tank tracks. Comparing the Pleiades satellite images of August 1 and 14 shows clear changes in the condition of vegetation. Tanks (right) the vegetation under their tracks. 

There are five tanks along the route at the top left part of the image. Tanks tend to avoid roadways, where they might be expected. They usually maneuver off-road, where they crush vegetation. A “tank commanded” quoted by Breaking the Silence explains: “I assigned one of my company commanders to document the maneuver by video, so we could illustrate it in training because in training we don’t have planted grove areas we can keep running over, or a variety of ‘live’ houses to shoot at.”

ANALYZED BY JAN D. VON DER WIECZOREK
AND FORENSIC ARCHITECTURE

The tank paths are recorded along most of their length because of the semi-arid nature of the frontier zone. The choreography of the war could not be recorded by its effect on vegetation. Following the crushed vegetation of tank paths backward leads to slight areas next to Israeli-agrarian settlements (marked in white circles) that surround the Gaza Strip. The use of civilian settlements for envelopment, surveillance, and military supply is significant given that Israel claims that Hamas is endangering its civilian population by locating its installations in inhabited areas. This image shows how dangerous the same, though it has enough space to choose not to.

AIR: NEPHELYSIS OF BOMB CLOUDS

After several weeks of unsuccessful attempts to improve the time resolution in the images and videos in which the visible shadows were more than several hundred meters away from the photographer, we realized that we were looking for physical clocks, analogue time indicators, in the wrong part of the image. Almost every image had some sky in it. August 1 was a cloudless day, but because of the massive bombardment, almost every piece of sky caught on camera contained one or several bomb clouds. These bomb clouds, columns of dust hundreds of meters high, could be seen from everywhere in the strip and even from Israeli cities, where people reported seeing giant columns of dust from forty kilometers away or more. Their monstrous size made photographers tilt their cameras upward to include their full extent and captured more sky in the frame at the expense of the earth. The constant transformation of these bomb clouds and their unique form in doing so meant they could function as a form of metadata—indicators of an image’s time/space coordinates—with which we could synchronize and sequence many of the images of the day as we built a narrative.

Unlike meteorological clouds, bomb clouds are anchored to the ground. Still, like weather clouds, they undergo constant transformations and metamorphoses. Each has a unique signature at any given moment. We started by forming an archive of bomb clouds, dividing them by shape, type, and stage of transformation. It was perhaps a contemporary version of a nineteenth-century cloud atlas. We consulted our colleagues in art history.

According to art historian Hubert Damisch’s book A Theory of Cloud: Toward a History of Painting, when in sixteenth-century painting the territorial part of landscape painting started to be organized according to the rules of perspective, the sky part of the image still belonged to an older symbolic order, referring to spirituality or sacredness. That clouds are undergoing constant metamorphosis, that they move, change, and transform from one form to another, dissipate, or gather out of nowhere posed an ongoing problem for their classification and pictorial representation. The problem persisted in the early years of photography: the long exposure time wiped the clouds away from the sky in the same way that it wiped people away from a Paris street. (See “Before and After” in Part 1.) Clouds simply changed their form faster than a painter’s hand or the exposure time of daguerreotypes could capture.

Different techniques and technologies had to be conceived to capture clouds as static objects in measurable skies. These extended from the
cloud contraptions developed by the fourteenth-century architect Filippo Brunelleschi to project the geometries of the sky onto the inner surface of a dome through the rectilinear and curvilinear perspectival grids proposed by Victorian art and architecture historian John Ruskin.

Beginning in the early nineteenth century, amateur meteorologists started engaging in the morphological science of cloud study. Luke Howard, a British chemist who observed the skies from his house in Tottenham, North London, classified clouds by their visible characteristics, harnessing their infinite variation by genus and type—cirrus ("a curl of hair"), cumulus ("a heap"), and stratus ("layer")—as if they were singular objects, plants, or animals. The nascent science of "neplanalysis"—the study of cloud form, types, and movement—influenced artists such as John Constable and J.M.W. Turner, who focused their meteorological attention on the dynamic texture and shapes that had started to be named by science.

The clouds we were looking at in Rafah were of course not caused by the weather, although they interacted with it. The relevant expertise was not meteorology, but blast engineering and fluid dynamics. The unique fingerprint of a constantly transforming bomb cloud depends on the materiality of the target and the ammunition used to destroy it, as well as on microaesthetic conditions such as humidity, variations in temperature, wind direction, and speed at different altitudes.

Regardless of these variations, bomb clouds go through several distinct phases. The blast generates a zone of low pressure that sucks in all aggregate substance that the bomb had just pulverized, including recoil from the earth, and debris dust from the building. These tiny particles of aerosol rubble then mix with smoke and gather water vapor around them. The heat generated by the blast pushes this aerosol mixture rapidly upward. The column rises in turbulent, gyrating verticles until its temperature and pressure even out with that of the surrounding air. At this altitude, the rising vapor and dust column start pouring sideways as if hitting a glass ceiling, and the cloud opens up like an umbrella or a mushroom. Moments later, the debris starts raining down onto the shadow of the cloud, which starts slowly dissipating. The entire process lasts for about ten minutes.

In his essay "The Storm-Cloud of the Nineteenth-Century," John Ruskin, who was also the patron saint of the Cloud Appreciation Society, lamented the loss of the skies to a new form of cloud—the formless smog of the Industrial Revolution. He thought of these clouds not as natural phenomena, subject to meteorological study, but as technology, human products, the atmospheric materialization of human labor and mechanization.

The material composition of bomb clouds is even more devilish than those two-centuries-old products of exploitation. They include everything that a building pulverized by a bomb once was—sand and soil from under their foundations, the concrete of their structure, the crushed plaster of their interior, the plastic, fabric, wood, glass, paperwork, utensils, and furniture in them, as well as, sometimes horrifyingly, remnants of human bodies. These clouds are airborne cemeteries of architecture and flesh. A resident of Gaza to whom I spoke during the bombing of 2008–2009 told me about neighborhoods "turning from solid structures to dust, and the dust of homes filling the air," about survivors breathing in pulverized life.

The soft, temporary, and ever-changing architecture of bomb clouds contrasts with the solid, hard architecture of buildings on the ground, but it is architecture nevertheless, a temporary, gaseous architecture with a life span of seven to ten minutes. In its extreme form, it demonstrates a truth about all buildings. I started Part 1 of this book with a description of a surveyor studying building transformations as the proper condition of all architecture. A bomb cloud in this context is the extreme condition of architecture, its cycle of emergence and decay played in fast-forward mode.
Our cloud atlas included all bomb clouds captured on the images we had of August 1 in Rafah. We carefully classified and grouped each cloud by stage—blasts, upward moving columns, mushroom caps, dissipation. This allowed us to estimate how long after the explosion each photograph was taken. Particular formal irregularities distinct to each bomb cloud allowed us to find the same clouds in other images. When we managed to identify the same cloud from two or more perspectives, we could determine that the images were synchronous. We modeled some of the clouds volumetrically, as architectural forms, to establish the angle from which they were captured. We could thus establish the location of the bomb by plotting and intersecting the camera perspectives on the satellite image. When we managed to establish the time-space coordinates of one bomb cloud, we looked for all other images that had that same cloud plus another, thus determining the time of the other bomb and then triangulating further.

After locating the time and space of the images of clouds in the sky, we turned our attention back to the ground parts of these images and to events unfolding there. The bomb clouds helped anchor media with testimonial evidence. Many testimonies were organized around the bombing incidents that people recalled—could not forget—because of what happened to their homes or families. They often described their own movement through the city as a sequence of events punctured by bombing incidents. The bomb clouds could thus function as anchors for the events of the day, grounding testimony and evidence, meteorology, buildings, and ruins in a forensic assemblage was at once the product of media, memory, and material reality.

**SUBSOIL: THE UNDERGROUND MANHUNT**

The two one-ton bombs that were dropped on the Tanur neighborhood landed atop a small, single-story, corrugated tin structure that stood empty between several buildings. The small structure was completely devoured by a crater fifteen meters wide and ten meters deep. That such a structure was targeted by two of the largest bombs in the Israeli arsenal suggested that the air force was likely aiming at something else. We believe this might have been a tunnel that they suspected ran underneath the little shed. The shed could have been an entrance or a shaft.

From the shape of the crater, it became apparent to our munitions adviser, Chris Cobb-Smith that the bombs employed in this strike were ground-penetrating bombs. Such bombs do not explode upon impact. The milliseconds of delay between impact and detonation allow them to bore into the subsoil and explode underneath the surface. The pressure caused by the shock waves is designed to collapse any tunnel in the vicinity. Because the tunnel is the only source of oxygen underground, a fireball could form there and storm along its length. Sometimes, as reported by a Breaking the Silence witness, “When one side of a tunnel is bombed, a kilometer away, on the other side, you see the tunnel’s other shaft fly up in the air.”

To verify whether the military bombed the tunnels, knowing their captive was within, under the terms of the Hannibal Directive, we needed to shift our attention to the subsoil and try to map the tunnel network there.

During the war, the military started to realize that its most vulnerable borders were not the airspace, where its “iron dome” antimissile system proved quite effective, or the fences and walls it erects around the Gaza Strip, but the crust of the earth separating the subsoil from the ground’s surface. It was a space into which it had no effective means to survey. The Israel’s ground incursion, which began July 17, aimed to destroy the network of tunnels without being able to see them, a fact that contributed to the massive destruction of entire neighborhoods that ensued.

The city of Rafah is where the tunnel project in Gaza began, where it grew, and where it became increasingly sophisticated. The city has more tunnels than anywhere else in the strip for geopolitical, geological, and socioeconomic reasons. Geopolitically, it is located between two sealed borders, to Israel and to Egypt. Geologically, it is in a more arid area, and the water table under the southern end of the Gaza Strip is lower; the soil there is compacted sandstone, lighter, drier, and thus easier to dig through than elsewhere in the strip. Consequently, several families from Rafah hold a near monopoly on the “market” for tunneling work throughout the rest of the Gaza Strip.

Rafah’s first underground tunnels were dug across the short border to Egypt following Israel’s 1967 retreat from Sinai. The Egypt-Israel agreement led to the partition of the city between the sides. Soon enough, tunnels became the only way for goods and weapons to be brought into the strip outside Israel’s control. A decade later, starting in 1992, with the launch of the Israeli-Palestinian Oslo process, Israel started gradually isolating Gaza and fencing in its population. Throughout the years of the second intifada, starting in 2000, and to a greater extent following Hamas’s takeover of power over the strip in 2007, the closure of Gaza tightened, and the tunnel system connecting it to Egypt was expanded to maintain an essential inward flow of goods, food, and other provisions, as well as weapons. While most tunnels ran across the border to Egypt, some also started to be
These three video clips capture the same bomb cloud. We synchronized the clips by matching details in the form of the cloud. Next, we established the location of each camera and its zone of vision. Then we triangulated the three perspectives. Their intersection led us to the Tanur neighborhood in eastern Rafah. **LEFT:** RESISTANCE PRESS CENTER. **CENTER:** ABDEL KHAFR SHAKIR AND MOHDI AL-SHAH, ANALYSIS BY FORENSIC ARCHITECTURE.

dug across the border to Israel. In 2006, it was through such a tunnel coming out in Rafah that Gilad Shalit was captured.

Until Israel’s retreat from Gaza in 2005, military attempts to destroy the tunnel network connecting the Egyptian and Israeli parts of Rafah led to the destruction of eighteen hundred homes in the border area.114 As long as Egyptian president Hosni Mubarak and his elected successor Mohamed Morsi were in power, the tunneling business prospered. Following the 2013 coup in Egypt, the Egyptian military, under the self-proclaimed president Abdel Fattah el-Sisi started demolishing Hamas’s tunnel network—it perceived Hamas as its enemy—on their side of the border, destroying all buildings in the Egyptian part of Rafah that were within a two-kilometer strip from the border—almost the entire extent of the Egyptian town.115

The direction of Palestinian tunneling was then reoriented toward the Israeli border though there were tunnels going toward the border before. Unlike the wide “smuggling tunnels” to Egypt, the “attack tunnels” to Israel were only as wide as necessary for the movement of combatants walking single file—about a meter in width—though these channels were also quite well supplied with electric generators, living quarters, food, ammunition, and sometimes even small command centers. With spades, buckets, and increasingly with pneumatic drills, teams of diggers working

When closely studying the changing morphology of these bomb clouds, we noticed an additional detail. Two single still frames captured bombs in midair, fractions of a second before impact (above). In order to identify these bombs, we needed to measure their size. We placed the photographic surface at the location of the bombs into the 3D model (below). RESISTANCE PRESS 2012, ANALYSIS BY FORENSIC ARCHITECTURE 2015.
Because we were able to measure the image plane—it was 150 meters long at the distance intersecting the bomb—we could determine the dimensions of the bombs. An online catalogue helped us identify them as US-manufactured MK-84/GBU-31 JDAMs. These bombs are packed with one ton of explosives and are among the biggest and most destructive in the air force's arsenal. A one-ton bomb dropped on an inhabited civilian neighborhood is possibly a war crime.

round the clock in two twelve-hour shifts can dig and reinforce an average of ten to fifteen meters of tunnel a day. Hamas spends a large part of its budget making and maintaining these tunnels. The more complete Israel's control from the air became, the deeper and the more fortified the underground tunnels were made.

The creation of an extensive and deep tunneling network by different digging groups necessitated the establishment of something resembling underground traffic regulations to avoid collisions. Underground traffic control is similar to air traffic control in that both regulate movements within three-dimensional volumes that start and end at the surface, only they go in opposite directions. Israel's exposure of these underground traffic regulations allowed its military to estimate the paths of tunnels after identifying an entry or an exit point. Tunnels mostly progress along one of two possible directions: east-west, for smuggling tunnels to Egypt, or perpendicular to the direction of the Israeli border, from northwest to southeast, for attack tunnels. Keeping to these basic directions requires the use of GPS, compasses, and satellite images. Each grid of tunnels leads to a number of exits or mouths, usually hidden within buildings, greenhouses, or workshops.19

As the bombardment began, two photographers—Abdel Karim Shu’it and Ahmed Abu Saud—ran up to the eight-floor offices of the Smart Media Center in the Mall Towers and started taking photographs. The images they sent us after the war showed a wide panorama of a city under fire. The frame, horizontally divided between the cityscape and the sky, linked by bomb clouds, recalls all-too-common representations of the cities of the Arab world: Baghdad, Beirut, Gaza, Damascus, and Sana'a. The metadata on the images was intact, but the clocks were wrongly set—the photos registered a time close to midnight, while it is obvious from the photographs that we thought they were taken during the day. However, the time gaps between the photographs were consistent throughout the sequence.
We superimposed the location of the strikes which we previously established through the triangulation of the bomb clouds in the air, on top of the assumed paths of tunnels underground. The materiality of these media each described another limit to architectural investigation: in the air, it was the fast metamorphosis of soft elements, while underground, it was the invisibility of the negative spaces of tunnels that posed a challenge for us. However, if the location of the strikes overlapped with the location of the tunnels, and if the timing of the bombing coincided with the time the military believed the captured soldier was in them, we could support claims that a manhunt aimed at the captive might have taken place.

We were careful not to collect information or map more of the location of the tunnels than was necessary for us to make our point. It was not safe for our partners and for us to collect and exchange information about their locations, and despite not being supporters of Hamas, we also did not intend to do the Israeli military’s work for them. Inasmuch as we inadvertently received information about their paths, we removed it from our files. We mapped only those parts of the tunnel networks that were already exposed or dug up by the military, that is, only those places where the military already knew or believed tunnels to be. The traces of deep mechanical digging were visible in ground-level photographs taken by our team members Ahi’a Hammouda, Nael Monsalam, Shoironeh Molavi, and Kent Klich. These locations were corroborated by studying satellite photographs from August 14, the next time after the battle that a high-resolution satellite survey was undertaken. In them we could identify deep traces of excavations.

Other useful sources for determining the path of the tunnels were accounts made public by the military. The most comprehensive of these sources was the first-hand account of Lieutenant Eitan Fund, an officer in the Givati reconnaissance unit and a personal friend of Lieutenant Goldin. On the morning of August 1, Fund led a small team of soldiers into the tunnel in pursuit of Goldin. Half a year later, in February 2015, Fund received the highest military decoration given to any Israeli soldier during this war. On that occasion, his account of moving through the tunnel was extensively reported in the media, which needed a hero in a war that was otherwise seen by many as a military failure. Inadvertently, it provided much of the missing information.

At 9:54 a.m., slightly less than an hour after the firefight in which Goldin was captured, Lieutenant Eitan Fund, after repeated requests, received Ofer Winter’s permission to enter the tunnel. Fund stormed in, pistol in
The architectural image complex. The three-dimensional model provided us with a means of composing the relations between multiple images and clips and an optical device to navigate between them. The smoke clouds were used as the anchors that connect the multiple sources.

Inam Duda Ayed bin Hammad was knocked unconscious by the Tel Aviv bombing. She described the scene: About sixty people passed onto the streets after an artillery barrage hit the neighborhood. Then a bomb fell. "Suddenly there was smoke, dust, rubble, and shrapnel flying above us." Here is a description of the Tel Aviv bomb cloud from below: "A column from a wall fell, protecting my daughter Remai and me from the shrapnel. I lost consciousness for a few minutes, and when I recovered, I felt a pain in my leg. I got up from under the rubble, took my daughter and stepped out." Twelve out of the sixteen people killed in this bombing were her relatives and included her five-year-old son, Anas bin Hammad. Because of the curfew and the ongoing fire, ambulances could not come near, and the wounded and dying were left for long hours on the road.
hand, with three other soldiers behind him. He described the tunnel as pitch dark, head high, concrete clad, and with electrical wires running its length. The soldiers used flashlights and shot forward continuously as they pushed forward. Fund has almost lost his hearing from the reverberations. When asked if such shooting would not have killed Goldin, Fund explained: "I instructed the soldier next to me to open fire if he identified any figures—even if it meant killing or wounding Hadar (Goldin). Painful as it is, it is better that way."

Fund seemingly understood Goldin's death to be preferable to him being taken alive, in line with the manhunt logic of the Hani bal Directive. That he received a decoration shows that his actions were not only condoned, but rewarded. After "three to four hundred meters," Fund recalled, he reached a T junction. Next to it, the soldiers found blood traces, along with some of Goldin's clothing and personal equipment. Two hours later, Fund reentered the tunnel to retrieve them. The right turn of the T leading toward the Israeli border, was blocked off with a blanket. Behind it, he said, was a pile of military bags with battle-ready equipment, food, and water. Fund ordered two of the soldiers to stay at the junction. Together with another soldier, he started running into the left branch of the intersection leading toward Rafah. He noticed another bifurcation. After a few minutes, another group of soldiers entered the tunnel to shout to them (the radio didn't work underground) to get out immediately. Fund then turned around and started running back. According to Fund, the incursion into the tunnel lasted slightly over thirty minutes. He could not have covered a third of a twenty-five-hundred-meter-long tunnel when ordered out. Goldin and his captors were likely still in the tunnel, only farther on.

The soldiers left the tunnel at about 10:30 a.m. At 10:47, according to the military's own description of events, the air force bombing began. We were able to locate and time to 10:52 a number of massive bomb clouds from one-ton bombs dropping in the area north of Salahi al-Eddin Street. (This is the area marked in the satellite image on page 197.) At 10:53, as previously shown, the Tamur neighborhood was bombed with another pair of one-ton bombs. The fact that these strikes took place just over fifteen minutes after the soldiers left the tunnel points to a temporal correlation: it is consistent with the military ordering the soldiers out of the tunnel in order to start bombing it.

The location of several of the bomb clouds overlaps with the location of the excavation made by the military in its search for tunnels. The timeline of these bomb strikes coincides with the time immediately after the search was aborted and the tunnel was evacuated by Lieutenant Fund and his soldiers.

The red square marks the tunnel block structure, over the tunnel mouth where the firefight took place.

A small shed, marked in red square, can be seen within the Sa'ad Sayel military base.

Fields and greenhouses.

The greenhouses are destroyed, and heavy mechanical digging can be identified in the area marked by a red rectangle.
It was not any single incident, testimony, image, or clip that helped suggest the logic of this manhunt, but a time-space puzzle of relations between a large multiplicity of incidents captured by different classes of evidence in hundreds of images from the air and ground, and dozens of testimonies, both civilian and military.

"It was likely," the Givati enquiry admitted in retrospect, "that the Hamas unit and Goldin never left the tunnel." Ohayon’s diary noted that after August 1, his unit was told that Goldin “was buried in the collapsed tunnel.” Hamas’ statement seems to concur: “We have lost contact with the mujahedeen unit that was in that ambush, and we think that all the fighters in this unit were killed by Zionist shelling along with the soldier.” The bottom-line,” another Givati commander said of Goldin’s captors, weeks after the end of the war, “is Goldin is not with them and the Hamas unit is probably exterminated.” The passive voice hides the fact that killing Lieutenant Hadar Goldin was what the military intended to do and likely did.
TO KILL A DEAD MAN

Lieutenant Goldin's personal items retrieved by Lieutenant Fund on his second incursion into the tunnel were helicoptered to the military forensics lab in Tel Aviv in order for his condition to be assessed. DNA analysis confirmed that the blood was his. It also reportedly demonstrated that vital organs were hit: "it was concluded," military sources were quoted as saying, "that even if Goldin had been taken alive, there was no possibility a Hamas doctor could have kept him alive." The original statement was potentially controversial: if Goldin was taken alive and survived for two hours in the tunnel, he could possibly have been killed in the air force bombings at about 10:33 a.m. The statement was later amended: the military confirmed, without acknowledging the retraction or making the forensic report public, that Lieutenant Goldin was killed in the initial firefight, at about 9:06 a.m.

The following evening, Saturday, August 2, after the end of the Shabbat, Minister of Defense Moshe Ya'alon, incidentally a relative of the Goldin family, arrived at their family home to share the results of the medical-forensic report and personally break the most terrible of news to the family. The family had only been previously informed that their son had been made captive. In the meantime, a rabbinical court (Beth-Din) was hurriedly assembled to issue a death certificate. In the absence of a body, the level of proof required by the religious authorities to pronounce death is higher than that required by the legal system. In previous years, in response to lessons drawn from captures where the military had no certainty regarding the state of the soldiers, the rabbinate acquired new forensic technologies meant to help establish death remotely, without the necessity of examining the body. Forensics thus has become a strategic parameter on the battlefield. Identification could be based on "fingerprints, X-rays, dental records and DNA" and "cameras could beam evidence from the field in a very short time to the chief rabbi's desk." The necessity for fast identification and assessment is part of the logic of the Hannibal Directive, because it likewise seeks to take away the enemy's asset. According to the military, Hamas, aware of these forensic capabilities, tried to hide evidence of Goldin's condition in order to increase uncertainty.

At 11:25 p.m. on August 2, the rabbinical court established Goldin's death, and his death certificate was signed by Chief Military Rabbi Raffi Peretz. The military confirmed that in declaring Goldin's death, it took into account both the forensic finds and "other relevant considerations." Peretz later explained what these other considerations could be: "the rabbinate was part of the combat theatre, and in a combat theatre, commanders take responsibility...our contribution to the fighting was certainty." Peretz ruled that the bodily fluids retrieved were enough to conduct a funeral. What remained in Gaza was now body parts, and although Hamas later claimed to have retrieved the body, for the time being, the Israeli government has not been willing to enter into negotiations about it. The death certificate and the funeral thus completed the task of the Hannibal Directive. The pronouncement that Goldin died in the firefight was also convenient for another reason. The military could now conveniently claim that they had not killed him when they collapsed the tunnel: you can't kill a dead man.

MEANWHILE...

The bombing of Rafah continued as this medico-theological drama was unfolding. About an hour after the death certificate was signed, a young medic in Rafah named Yasser Wahhab called his wife, Nehay. She and their children had taken refuge at her brother's house while he was on ambulance duty.

My wife had left me a message, so I returned her call at 1 am and we chatted for a while about normal things - whether the children had gone to bed, whether they had eaten. She said not to worry about them; they were all fine where they were. All of a sudden, a missile landed on their house and the mobile went dead. I tried calling her back but it did not connect. Nehay was killed, along with four of their children, while their father was on the phone with them.

The next morning, the young Mohammed Abu Duba, the first part of whose testimony was reproduced earlier, managed to find the bodies of his father and brother Munir. He went to search after they did not return from a trip to salvage belongings from their home close to the battlefield.

I rang Munir's phone and heard it ringing. I said "thank God." It was the ring tone I recognized ringing around me. I looked and saw...he had been thrown onto high voltage wire...if it hadn't been for his shirt, I wouldn't have recognized him. I ran to him and pulled him off the wire. He and I both fell to the ground. I looked at him. His face and left hand were all burnt and all his fingers were cut off except for one: his forefinger. I embraced him. I turned off his mobile phone. And carried on holding him.
I wondered where my father was. I looked around and found him strewn about six metres away without a head. I ran to my father but before I got to him I fell, fainted. I tried to reach him but I couldn’t. I called for help but nobody was around. Every time I tried to carry him I fell over. I fell to the floor and lost consciousness. Every time I woke up I saw him and so I fainted again... I thought I was dreaming and that none of this had happened.131

All this killing, including that of an Israeli officer, is heartbreaking. Analyzing and recounting the events of August 1, is hard to get through. It was Goldin’s funeral, taking place at 5:30 p.m., August 3, 2014, that gave the signal for the Israeli withdrawal from the Gaza Strip. Aerial bombings lasted until August 26, after which the level of fire went down and the situation returned to the status quo—the state of strangulation, isolation, deprivation, siege, and unemployment that defines life in Gaza.

POSTSCRIPT: TRIAL AS DENIAL

In the aftermath of the Gaza war, the two cases, that of Hannibal in Rafah and that of the Nakba Day killings, got entangled. In September 2014 the ICC announced its intention to open a “preliminary investigation” into Israeli war crimes (Amnesty International and Forensic Architecture submitted the above report in evidence, and were invited to meet the prosecutors to provide clarifications). Slightly more than a month later, in November 2014, the arrest of Ben Deri for the Bitunya killing seemed like a strategic move. Minister of Defense Ya’alon used the indictment (for the same killings he had previously denounced as fabrication) to argue that the state’s legal system was capable and willing to investigate the 2014 Gaza War, and even to charge its own personnel, thus rendering international process redundant under the principle of “complementarity” previously mentioned. Behind the trial of Deri could thus have been an attempt to silence the investigation into the carnage of Gaza. When used in this way, a trial might itself be used as a means of denial.

The relation between the two cases got further complicated when another incident was made public. On March 24, 2015, in the Jewish settlement of Hebron, an Israeli soldier, Elor Azaria, was caught on camera executing a wounded Palestinian assailant, Abdel Fatah al-Sharif. Al-Sharif was first shot when stabbing a soldier, but was lying severely wounded on the ground when executed a few minutes later. The video, recorded by a resident of Hebron, was posted online by B’tselem and from there made

It to the front page of most international news. Azaria was arrested and charged with manslaughter. Because the killing could not be denied, the case revolved around the interpretation of its context. The defence referred, as it often does in such cases, to the duration of a “split second” in which a soldier must decide how to act. Azaria claimed he feared al-Sharif had a suicide belt (there was none). But the prosecution ruptured the “split second” argument by showing Azaria casually handed his helmet to another soldier before the shooting, and told another after it that al-Sharif was “deserved to die.” This, however, resonated well with the Israeli public. Polls showed that sixty per cent supported Azaria. Netanyahu spoke to and comforted his parents and publically advised the judges to keep the larger context in mind.132 Of the government ministers, Ya’alon was alone in taking public position against the killing in the name of “military ethics” and in recognition of the implications that failure to prosecute might have in the forums of international law, but he quickly lost public support. In May 2016, Netanyahu fired and replaced him with extreme right politician Avigdor Lieberman, who had vigorously campaigned for Azaria. When on January 4, 2017, Azaria was convicted, and more demonstrations erupted, the entire government called for his immediate pardon. The vigorous public calls for pardon have in turn put pressure on the prosecution in the Deri/Navara case. It was a few days after Azaria’s conviction that attempts to force the negligence plea mentioned earlier were made.

In May 2016, shortly before Ya’alon was sacked, the defence establishment decided to cancel the Hannibal Directive. Israeli legal experts cited its application on August 1 as the prime example for the command’s incompatibility with international law.133 It is unclear what will replace Hannibalism and whether the cancellation of the command will help stop a full criminal investigation into the incidents of August 1 by the ICC. Considering the death and destruction that the directive has brought, its cancellation might save some lives. If our investigation had a part in this, it might seem satisfying, but in the complex politics of counterforensics in Palestine, any partial success could also be abused, and the line between winning and losing is often unclear. We will keep on investigating and making public Israeli violations and brace ourselves for a political struggle in the long haul.