


Collective empiricism and the material witness

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Abstract. This article develops two arguments. One follows from the idea that materials can be made into witnesses to environmental violence by drawing together the evidence generated from multiple sensors. In this way, the practice of Forensic Architecture entails a commitment to a distinctive form of collective empiricism that leads to the generation of ‘informed materials’. The second theme of the article follows from Forensic Architecture’s claim that the microphysical investigation of specific incidents can be a starting point in reconstructing larger political and environmental processes. In light of this claim, the author interrogates the relation between the evidence generated by material witnesses and the political situations to which this evidence contributes. His contention is that qualitative forms of social and historical research are required that both complement and go beyond the limits of Forensic Architecture’s commitment to collective empiricism.

Keywords. empiricism • environmental violence • Forensic Architecture • informed material • political situation

I

The first part of a short film titled *Land-Water* follows a woman as she picks herbs from the garden of her house in the Rioni Valley in the Lechkhumi region of northwest Georgia. The woman, Maka Suladze, tells the viewer that her garden contains a ‘whole pharmacy of amazing plants’ that she uses to make medicine. She speaks of the way in which she needs to read nature and talk to plants – just as one talks ‘to birds and other animals’ (Tsotoria and Gogua, 2020a). The plants, one might say, are for her a companion species (Haraway, 2003: 15–16). They are not products to be sold; they have connected lives. We also learn from the film-makers that Mrs Suladze is taking part in a court case to stop the construction of the Namakhvani hydropower plant, which is projected to flood the valley, including her house and her garden. However, Mrs Suladze does not speak about the construction project directly, and the film portrays a peaceful although melancholic scene.

The population of the Rioni, which is now mainly elderly, had already declined substantially since the independence of Georgia from the Soviet Union in 1991, while the road running along the valley had deteriorated, and many village houses had been abandoned. There is no indication when the film was made but, at the time of its release, preliminary construction work on the hydropower plant (HPP) had already begun, and protests and confrontations with police followed. Indeed, the question of whether the HPP should be built or not became a major issue in Georgian politics, entangled in the debates that followed the parliamentary elections of 2020, drawing in the interest of activists, clergy, environmentalists and media from the nearby city of Kutaisi, as well as the capital city, Tbilisi. Facebook pages and websites were established to 'save the Rioni'. Geoscientists from the Institute of Earth Sciences in Tbilisi raised questions about the stability of the valley's walls and the prevalence of seismic activity in the area, and the potential for a catastrophic rupture of the dam itself, while the World Wildlife Fund warned that construction of HPPs on the Rioni could destroy the spawning grounds of rare freshwater sturgeon (World Wildlife Fund [WWF], 2020). The materials, plants and animals were not just potential witnesses to the threatened violence to others, but also to each other; taken together, they form what the film theorist Claudia Breger has termed a 'composite agency' (Breger, 2020: 16).

II

The architect Susan Schuppli has coined the term 'material witness' to refer to those materials that might serve as witnesses to violent acts or catastrophes that have happened in the past, and whose consequences continue to unfold (Schuppli, 2020). The plants of Mrs Suladze's garden and the water of the Rioni river that flows nearby can be understood as material witnesses of the environmental violence that threatened to happen to the valley in the future.¹ Through the film they testify to the catastrophe that was anticipated (Tironi et al., 2014). They are witnesses to the potential impact of the project not just on the human population of the valley but also on its wildlife, plants, the valley walls, which could become more subject to landslides, and the river itself and its atmospheres.

In this article, I take Schuppli's account of material witness to raise two sets of questions. First, I examine the claim made by Schuppli and her collaborator Eyal Weizman that the practice of Forensic Architecture is able to draw on what Weizman (2017) calls 'the sensorial capacity of the earth itself'. Although the practice of Forensic Architecture makes use of state-of-the-art techniques in data visualization, it also uses the natural environment as a sensor, registering and anticipating the responses of materials and animals to damage and violence. At the same time, Weizman's proposition is that Forensic Architecture offers 'an engaged objectivity'. Although objectivity has historically been

associated with political neutrality and disengagement, Forensic Architecture is an explicitly politically motivated practice that responds both to violence towards people and to those forms of environmental violence that are ‘not considered violence at all, thus demanding that we expand our definition of what might constitute violence, what might count as killing, and also what amounts to evidence’ (p. 188; Forensic Architecture 2014, 519–553). How then does Forensic Architecture become an apparatus of translation that makes it possible for non-humans to speak (Maniglier, 2021)? And how might it be possible to draw the evidence of nonhumans, as material witnesses, together with a commitment to an engaged objectivity?

The second set of questions concerns the relation between the evidence generated by material witnesses and the political and legal situations to which this evidence contributes. Schuppli and Weizman are acutely aware that the production and circulation of evidence has effects, and deliberately so. As Forensic Architecture recognizes, the generation of evidence has the potential both to open up new political questions and to contribute to the resolution of legal disputes. The presence of material witnesses may supplement, transform or undermine the status of evidence that already exists, with consequences: ‘material witness . . . continually twists between divulging “evidence of the event” and exposing the “event of evidence”’ (Schuppli, 2020: 3). While Weizman does not refer to ‘material witnesses’ extensively, Schuppli’s term clearly captures the double sense that witnesses may take the form of non-human materials *and* that their evidence can become material to a legal dispute. I use the term material witness throughout this article and, in doing so, emphasize the similarities between the work of Weizman and Schuppli, as well as other members of the Forensic Architecture group, rather than the differences between them.

III

The historians of science Lorraine Daston and Peter Galison remind us that it would be a mistake to equate objectivity with science in general. In their account, what has historically been called objectivity is a particular epistemic virtue, a technique of the self that became increasingly dominant and institutionalized in the 19th century. In their book, *Objectivity*, they prefer to find manifestations of this virtue not in the work of philosophers of science, or in the statements of scientists, but in the history of scientific visualizations – for ‘by examining volumes of images of record (including atlases, handbooks, surveys, and expedition reports), abstractions like objectivity become concrete and visible’ (Daston and Galison, 2007: 27). Indeed, atlases are particularly valuable for the historian interested in tracing the history of objectivity as ‘the atlas is a profoundly social undertaking [or to be precise] an exemplary form of collective empiricism’ (p. 26). Note

how Daston and Galison's investigation draws particular attention to the links between collective empiricism, histories of objectivity and histories of mapping and visualization. Following these insights, in the remainder of this article my focus is mainly on the visualizations produced by Forensic Architecture, although I return later to consider the significance of the case of the environmental violence associated with the construction of the Namakhvani hydropower plant in order to point to the limits and limitations of Forensic Architecture's commitment to a form of collective empiricism.

The work of Forensic Architecture does not lead to the production of atlases of the kind described by Daston and Galison. Rather, forensic architects generate a palimpsest of digital maps and other visualizations, sometimes in four dimensions, assembled from multiple sources and supplemented by sound recordings, that document violent events in detail, recording their precise location and time, or tracing the course of violence as it unfolds over time. Whereas the atlases of the 19th century often marked out an administrative region or colonized territory, Forensic Architecture's investigations assemble the matrix of elements that enable the researcher to disclose what Weizman calls a 'force field' of relations (Fuller and Weizman, 2021: 165; Weizman, 2014: 9) and Schuppli (2020: 6) terms an event. Forensic Architecture does not provide a two-dimensional map, but assembles what one might call an *event-map* from a myriad of sources, including satellite images and camera phones, which record sound, image, voice and time as well as geolocation. In this way, the practice builds a 'dynamic field of interacting points of view, camera angles, and time scales – an architectural image complex' (p. 70; see also Bois et al., 2016: 125).

The oversaturation of images (Harasymowicz, 2017) that underpins this practice is made possible by transformations in what Celia Lury (2020) has termed the 'epistemic infrastructure' of digital media. This infrastructure includes imaging technologies and social media platforms along with their associated software and standards. In mobilizing this infrastructure, Weizman suggests that the practice of Forensic Architecture pushes the 'threshold of detectability', a threshold that is determined by a combination of legal regulation, geopolitical imperatives, the availability of multiple media sources and the limits of their resolution. Forensic Architecture exhibits an obsessive focus on the exact location between bodies and objects, but as the legal geographer Alex Jeffrey observes, the practice is not positivistic in so far as the forensic architect is acutely aware that the visual and sonic recordings obtained from camera phones and new media always demand further interpretation and manipulation, as well as their triangulation with other sources (Jeffrey, 2020; see also Bois et al., 2016: 126). Nonetheless, Forensic Architecture's relentless focus on the detectability of image and sound, and the expectation that testimony should be based on visible evidence does represent a form of what Daston and Galison (2007) call collective empiricism.

It would be a mistake to view the practice of Forensic Architecture as simply a realization of the affordances of digital image technologies. For this is a practice that also depends on networks of relations between lawyers, activists, journalists, community organizations and academic researchers – the whole apparatus of legal activism, which makes the circulation and editing of recordings possible, and potentially valuable. Moreover, as its proponents make clear, the history of the practice can be traced back not just through its technological antecedents (Virilio, 1989), but also through investigations of violence that have drawn on archival sources, and photographic and witness testimony, including witnesses to genocide (Weizman, 2017). These precedents include other politicized forms of engaged and collective empiricism, such as the growing use of ‘fact-finding missions’ performed by environmental and human rights NGOs in order to generate analogue testimonies of individuals and populations affected by, for example, corporate abuses of power (Barry, 2013). All these research practices are inscribed in either explicit analyses or broad understandings of the geopolitics of the situations within which these forms of research matter.

Yet there are also critical differences between the work of forensic architects and the analogue practice of activist researchers and journalists engaged in fact-finding missions. On the one hand, digital recording devices appear to provide a more direct, reliable and – paradoxically – unmediated access to the testimony of material witnesses than do human observers (Bois et al., 2016: 129; Schuppli, 2014: 57). On the other hand, it is striking that the practice of Forensic Architecture looks beyond the testimony of humans to draw on the evidence of material witnesses and their sensorial capacity, which Weizman (2014: 14) argues is able to register minute transformations ‘within force fields’, and which in turn generates aesthetic effects:

Aesthetics is originally understood as that which pertains to the senses, but in this context it designates not the human senses but rather *the sensorial capacity of matter itself*. It is the way in which matter can detect, register, and respond not only to contact and impact, but to influences in its environment and to remote presence. (emphasis added)

The material witnesses that have such a sensorial capacity may include buildings, damaged and destroyed by explosions or gunfire, shots and aircraft that produce sound and noise, and bodies that are revealed in heat images (Gordillo, 2015). Even bomb clouds can be understood as material witnesses or alternatively as ‘architecture in a gaseous form’ (Forensic Architecture, 2021a). Forensic Architecture’s reconstruction of the death of the Kurdish human rights lawyer, Tahir Elçi, for example, does not rely on statements from human witnesses but on the sound of gun shots and images of the movements and shadows of policemen, Kurdish militants and even a cat, all recorded by camera phones or filmed by television crews, countering official claims that

followed from a botched police investigation (Forensic Architecture, 2019). In other instances, the material witness to events may be physical, chemical or biological, and in these circumstances the practices of forensic architects come close to the work of environmental scientists:

the translation from the surface of the terrain to the surface of the film is referred to as 'ground truth' – a process used by meteorologists, remote sensing, or aerial interpreters to calibrate the analysis of images because there is a one-to-one relation between aerial photographs – indeed between any photographs – and the reality they capture. (Weizman, 2017: 289)

Highlighting this, forensic architect Godofredo Pereira coins the term 'geoforensics to indicate the need for [different techniques of environmental research] to come together to form a common mode of inquiry, so that it becomes possible to investigate human rights claims and environmental disputes as part of an entangled condition' (Pereira, 2014: 592). Weizman himself dwells, in turn, on the relation between climate change, afforestation, the use of pesticides and the location of illegalized Bedouin settlements in the Negev (Weizman, 2017: 247) in his investigation of the shifting borders of the desert. Hence, 'the problem of defining, delineating, and mapping the threshold of the desert was . . . never only an environmental question, but one that bore upon historical, political, and juridical considerations' (p. 230). Even the weather can provide testimony to the violent history of the Negev (p. 264), while the surface of the earth can itself become a material witness to what Rob Nixon (2011) has termed 'slow violence' (Apter, 2016).

Likewise, Schuppli draws attention to the sensorial capacities of materials and the ways in which they provide evidence of the violence associated with environmental change. In her work on material witnesses, she follows the traces of radioactivity that emanated from the explosion of the Chernobyl nuclear reactor in 1986, which were subsequently registered by workers at a Swedish nuclear plant and contaminated the footage of the film-maker Vladimir Shevchenko at the time. This contamination, she argues, 'complicates the conventional partitioning of time by hurling us unwittingly back into the contact zone of the event' (Schuppli, 2020: 63). Hence, the irradiated film expands the set of witnesses of Chernobyl to include nonhumans, but it also serves as an index of the event of which it is a part:

The irradiated image matter of Shevchenko's documentary offers a paradigmatic account of a material witness in which trace evidence of an external event – the nuclear accident at Chernobyl – is registered directly by changes in the material composition of the artefact, producing a condition of informational enrichment that opens up the artefact to further analysis and critical reflection. (p. 64)

The irradiated film is not, then, a representation of the accident, nor is it performative, serving to define the explosion at the nuclear reactor either as an accident or as the product of a failed system (Butler, 2010). Rather, as Schuppli (2020: 257) argues, the transformation of the film image, created by radiation, forms part of the event as it is unfolding: ‘the nuclear aesthetics of the material witness are always radically indexical to themselves.’ In this light, it is correct to say that the artefact (the film) is informationally enriched or, to use Bensaude-Vincent and Stengers’ term, it becomes an ‘informed material’ (Barry, 2005). The film is evidence of the event, but the film’s transformation – its irradiation – is also an event in the existence of the film, which thereby becomes a material witness (cf. Whitehead, 1920). Schuppli’s claim is that all material witnesses have this property: effectively, they become informationally enriched or informed materials.

The idea of a material witness as an informed material that is generated by the ‘sensorial capacities’ of materials is compelling. But it raises two questions. First, there is a question around the circumstances within which the material witness is enabled to speak to the violence that it has witnessed. The work of forensic architects is often shown in a gallery context (e.g. *Forensic Architecture*, 2021a; Tate, 2018), and in such a setting the value of images and texts is likely to be judged by gallery visitors primarily on artistic and/or political grounds and not so much on the basis of its veracity. After all, once in the gallery space, the audience do not have access to any alternative sources of evidence other than the evidence presented to them by the exhibit or installation, so they are unlikely to have the means or stimulus to challenge *Forensic Architecture* on evidential grounds. Yet the work of forensic architects is also expected to contribute evidence in quite different circumstances – especially to legal proceedings in courts of law, where it will be judged according to quite different felicity conditions:

When an expert gives evidence in court, the judge and the law take all precautions that what the expert says should be neither a judgement nor a warrant for judgement, but that it should serve only as a form of testimony which does not usurp the role of the judge. (Latour, 2010: 206)

In this forum, there are inevitable limits to the extent that any evidence presented by a witness – whether material or human – can determine a judgement, even if their testimony were to be accepted as mediated by an expert (Jeffrey, 2020). Material witnesses may not provide evidence that, in the setting of the court, are material or relevant to the case (Kang and Kendell, 2019: 6).

In the case of Chernobyl, pursued by Schuppli, a trial had taken place in the Chernobyl Cultural Centre in July 1987, but the court ‘had decided that only the personnel present at the time of the explosion of reactor meltdown would be

indicted' (Schmid, 2015: 144; Schuppli, 2020: 78). The trial had left unexamined and unresolved questions about the responsibility of the reactor's designer, the Ministry responsible for the nuclear industry and the Soviet system as a whole, which therefore made it impossible for wider concerns about reactor safety to be articulated in public. If individual managers were not solely responsible for Chernobyl, who or what should be included in the list of those held responsible? Should stress be placed on the flawed reactor design, or on the institutionalized suppression of scientific criticism, or on the over-reliance on the skills of operators? As the historian of the nuclear industry, Gabrielle Hecht, has observed, many critics of the Chernobyl disaster have pointed to the Soviet regime rather than the actions of individual managers and engineers as the responsible agent. In these accounts, the flaws that led to Chernobyl lie in the political and administrative system of the Soviet Union and in a reactor design that embodied the faults of this system: an 'utterly unique RBMK [reactor design] had fundamental design flaws, hidden by corrupt state apparatchiks obsessed with secrecy, prestige, and productivism' (Hecht, 2019). While a focus on the specificity of reactor design is necessary, Hecht argues that such accounts lay stress on the Soviet origins of the reactor, thereby reproducing widespread clichés about the Soviet Union, and, in so doing, fail to recognize that similar reactor designs existed in the West – so that this kind of argument did not threaten the claims of Western nuclear advocates that the technology is fundamentally safe. Schuppli (2020) therefore echoes Schmid and Hecht's recognition that Chernobyl had multiple causes, historical and immediate, proximate and dispersed. In the absence of a trial, Schuppli presented her preliminary findings about the Schevchenko film to a lecture room at the University of Tokyo, when an earthquake had recently occurred, violently 'tearing apart the landscape around Nikita' and resulting in malfunctions at the Kashiwazaki-Kariwa nuclear plant (Schuppli, 2020: 82). In this way, by linking Chernobyl to Kashiwazaki-Kariwa, Schuppli rendered Chernobyl a sign of the potential disaster that could, in principle, befall nuclear power plants in general.

IV

Forensic Architecture combines multiple digital traces, but it also composes a narrative that shows how such a combination is assembled (Breger, 2020). Indeed, the objectivity of the analysis is demonstrated by displaying the technical apparatus: by taking the audience step by step, albeit briefly, through the process by which non-humans are enabled to speak (cf. Maniglier, 2021; Sharp, 2020). But as critics have long argued, the weakness of an empiricist method, however reflexive, is that it must inevitably remain focused on what is directly observable or about which it is possible to find or generate traces. How then is it possible to address what it is not possible to visualize directly, or evidence that cannot be gathered?

What images and texts are made readily available, or made transparent, and what evidence is absent or ignored (Barry, 2013; Kelly and McGoey, 2018)? What sources are systematically absent, or are difficult to obtain, or the existence of which is denied (Ertür, 2019)? In practice, the answer to these questions, which are unavoidable for any empirical researcher, takes one of two ideal typical forms.

One form involves supplementing the visualizations generated through the technical practice of Forensic Architecture, by drawing on secondary sources, including research by historians and geographers (e.g. Kedar et al., 2018), as well as primary sources such as colonial archives, court proceedings, personal knowledge and the interpretations of participants (Forensic Architecture, 2021b; Weizman, 2017: 258). Weizman draws extensively, for example, on research on the history of Ottoman land laws and British colonialism in the Middle East in his investigations of the history of climate change and Bedouin settlement in the Negev. The British, Weizman observes, 'preferred not to send their policemen, cartographers, tax collectors, and troops beyond the threshold of the desert and left this task to their nascent air forces' (p. 232). This colonial political, military and environmental history informs Forensic Architecture's analyses in the present, for 'to understand an incident it is necessary to locate it in the world of which it is a part' (p. 221). While this appears an uncontentious claim, it raises the question of how it is possible to draw together an empiricist commitment that continues to push the 'threshold of detectability' and a critical hermeneutic method that relies on the interpretation of documents, informants and critical secondary sources. In short, if part of the ambition of Forensic Architecture is to generate 'a microphysical analysis in which the part or detail becomes an entry point from which to reconstruct larger processes' (Apter, 2016: 101–102; Bois et al., 2016: 134; Weizman, 2014), then a key methodological problem is how to translate between microphysical analyses and critical historical interpretation.

The second ideal typical form of forensic investigation is different. It does not entail locating an incident in the world of which it is a part – for that is not normally part of the role of the forensic expert, whose task is to draw conclusions from quite specific pieces of evidence. In this approach, the forensic architect works from the evidence, drawing quite specific conclusions (exactly when, where and how an incident happened) but says little about the world of which the incident 'is a part'. After all, the empiricist resists speculation and should exercise restraint about making claims to do with matters on which there is little or no evidence. In these circumstances, Forensic Architecture takes the form of a technoscientific practice that processes data about a particular incident through the replication of its method, while also acting as a form of counter-expertise, working on behalf of others (Forensic Architecture, 2014: 10). Consider, for example, how this approach is put to

work in Forensic Architecture's investigation of an alleged chemical attack in the city of Douma in Syria in April 2018. The investigation entailed the meticulous reconstruction of 'two sites as 3D models using available images and video material [and the reconstruction of the chlorine] canisters as digital objects [as well as analysing] the physical traces inscribed on them' (Forensic Architecture, 2021b). Such an analysis is confined to those raw statements of fact about matters that exist within the threshold of detectability. The Forensic Architecture reconstruction both supports the contention that this was a chemical attack and the hypothesis that the canisters were probably dropped from helicopters, but it does not dwell on the military or geopolitical circumstances at the time of the bombing or situate the investigation in the midst of the debate that followed.

This second approach contrasts with the first. Whereas the first approach situates an event historically, the latter seeks to generate a precise and purified analysis of an incident, leaving others to provide their own accounts of the context. This latter method is powerful both because it can, in principle, be replicated across a series of different cases, and because of its empiricist focus on matters of fact. Over 40 years ago, EP Thompson defended the critical value of history against Louis Althusser's accusation that Marxist historiography was merely empiricist and neither scientific nor critical (Thompson, 1978). As opposed to Althusser's contempt for empiricism, an innovative feature of Forensic Architecture is to be found in the particular form of its attempt to reclaim empiricism for critical purposes. For Forensic Architecture, in political situations in which factual claims are systematically denied, invented, or not investigated, empiricism itself can become a critical approach, one that enables matters of fact, above all, to matter (cf. Bois et al., 2016: 119).

The risk of replication is, however, that such an approach – which has come to rely on the availability or generation of multiple digital records – may be relevant for one situation but not for others. In principle, the practice of Forensic Architecture is 'site specific', recording events at the threshold of detectability; but in so far as it becomes an approach that is repeated across multiple sites, the challenge must always be how to remain site specific enough, particularly when other methods may be more appropriate. Consider, for example, the radically different approach to critical research taken by the historian Carlo Ginzburg, who made use of his expertise as an historian to re-read the transcripts of a trial that had led to an unjust conviction on the basis of which he was enabled to reconstruct past events, leading him to 'explore the implications – both methodological and (in a broader sense) political – of a series of features common to both professions [historian and judge]: evidence, proof, and testimony' (Ginzburg, 1999: 4). To achieve critical ends, others have drawn on the use of film-making, archival research, citizen science, remote sensing, ethnography, political fieldwork, or collaborative

work with environmental or geoscientists (Gambino, 2021; Herscher, 2014; Liboiron et al., 2018; Murphy, 2017). Such epistemic practices may generate other insights, foster different collaborations and raise distinct critical questions (Barry, 2013; Clarke and Kendell, 2019), and they will be relevant to different situations in which other forms of evidence can be generated.

A further challenge for any investigative practice arises because disputes are not often confined to one specific or singular issue. Parties may disagree about a whole host of claims about matters such as the motivations, interests and trustworthiness of participants, the underlying causes of an incident, or its circumstances, its historical antecedents, or its significance within a larger political process. In this sense, individual disputes often form part of what I have called political situations, the contours of which will be ill-defined, shifting and perspectival (Barry and Gambino, 2020a). The proposition that forensic investigations can become ‘an entry point from which to reconstruct larger processes’ is an important one (see also Fuller and Weizman, 2021: 163–165). But, as I have argued elsewhere, in a discussion of the epistemic practice of activist ‘fact finding missions’, there is a risk of moving too rapidly, and abductively (Barry, 2021; Peirce, 1934), from an account of a specific incident, which may be described with great precision, to an analysis of a larger process of which this incident is thought to be a part. What if these ‘larger processes’ are not unified by a single logic but instead contain multiple geological, historical, environmental and political processes, which may not act in conjunction with each other, nor operate at the same scale or have equivalent significance (Gambino, 2021; Toscano, 2012)?

To return to my opening vignette about the controversial construction of hydropower in Georgia, the dispute over the construction of the Namakhvani plant in the Rioni valley, alluded to in the film *Land-Water*, can illustrate this specific point, indicating some of the limitations of the collective empiricism of Forensic Architecture. In practice, the controversy in the Rioni Valley contained multiple vectors of contention, as well as processes and forms of slow environmental violence that may never come to light as a locus of conflict. These disputes concerned a range of distinct issues including: the nature of the links between the companies responsible for the Namakhvani plant and the collapse of tunnels at the Shuakhevi hydropower plant in 2017 (Green Alternative, 2021); the problematic conduct of the environmental impact assessments undertaken in Georgia; the devastating impact that hydropower development would have on the lives of the animal, plant and human population of the valley; the threat of landslides that could result from reservoir water entering into the valley walls; the basis for the calculations underlying electricity demand and exports that are used to justify hydropower construction; and the significance of hydropower development in Georgian politics (Barry and Gambino, 2020b; Green Alternative, 2019; Rioni, 2020; Wyeth, 2021). In this light, the material witnesses that could be found in the

Rioni Valley were not likely to be able to resolve this conflict given that it contained a number of intersecting questions. As Schuppli (2020: 267) notes, in a discussion of the presence of Fukushima, 'it is doubtful that the material witness, narrowly conceived as a juridical concept, can do the considerable work required to address matters of environmental justice and accountability for the radiological afterlives emerging out of Fukushima.' What if, in a specific case, a particular material witness does not readily lead researchers to the reconstruction of a larger process at all, but points to the coexistence of multiple encounters, only some of which are knowable, while others can be only faintly discerned, or go largely unnoticed (Apter, 2018)?

Consider also the second part of the film, *Land-Water*, in which Mrs Suladze talks about the Rioni River and her relation to it. Her words convey the collective agency of the ecology of the valley and of the river that is 'so infused in her being'. This is not an ontology that can be known, recorded and mapped; it can be only be felt and grasped patiently over time. Mrs Suladze explicitly asks others to think differently about the problem (cf. Schuppli, 2014; Stengers, 2005) while also giving a sense of the river's autonomy, which is 'restless, spring, soft, free-spirited, flexible, foamy, to be avoided, untameable' (quoted in Tsotoria and Gogua, 2020b). The river is part of her, as she makes clear, but it is also seemingly indifferent to or exceeds human political concerns, demanding that researchers engage with the river differently and ask of it 'the right questions' (Despret, 2016). While the Rioni valley controversy raises a series of questions that could, in principle, be investigated using Forensic Architecture's methods, Mrs Suladze's sense of an ecology that 'infuses her being' also indicates the limits of the group's commitment to a form of collective empiricism.

V

Living things and material objects have come to bear the traces of environmental violence, whether this has been generated by armed conflict, deforestation, mineral extraction or the development of hydropower. In response, the practice of Forensic Architecture has become something like an engaged environmental science that zooms in, gathering multiple traces made available by the proliferation of recording devices, generating a dynamic field of interacting and microscopic points of view, and registering the sensorial capacity of materials in a digital visual form. This is a type of collective empiricism that is intended to make the testimony of material witnesses public, with demonstrable legal and political consequences.

Yet, in focusing analysis on the immediate testimony of material witnesses and the generation of informed materials, much has to be left out from such forensic investigations and analyses. Of course, recordings may not exist, particularly in situations where evidence is systematically suppressed,

distorted, or denied (Ertür, 2019). Or, records may be difficult to generate when events have happened in the past, traces have been erased, or the impact of environmental violence has been slow and dispersed. The product of the collective empiricism of Forensic Architecture will necessarily be partial and incomplete, although arguably its conclusions need only be good enough to have significance in a particular gallery or legal context. However, as well as dwelling on the evidence of material witnesses and focusing on the detail and immediate 'force field' of incidents, Forensic Architecture also aspires to offer a type of analysis of particular cases from which it is possible to begin to reconstruct larger processes. While social scientists tend to start with broad assumptions about structure or context and frame an analysis of specific details in these terms, in principle Forensic Architecture moves in the opposite direction. But the risk is that moving outwards from the microphysics of a particular case, abductively, it may not be possible to be precise, or to generate material witnesses, or to grasp the encounters between persons and things that are not best captured by technical means at all (cf. Whitehead, 1920). Moreover, even if it is possible to forge a compelling narrative about the facts of a specific incident, collaborators and informants may well have divergent accounts, or disagree about what the significance of an incident is. In a period that is sometimes said to be 'post-truth', the forensic architect recognizes that empiricism can be a critical as well as an epistemic virtue. However, at the same time, a preoccupation with detail can leave unbridged how to trace the relation between material witnesses, events and the political situations within which they come both to matter and to be potentially transformative.

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Note

1. Following prolonged protests, the project contractor, ENKA, terminated its agreement with the Georgian government to construct the Namakhvani HPP in September 2021.

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