

Chapter Title: FOSSIL FUTURES

Book Title: A Geology of Media

Book Author(s): JUSSI PARIKKA

Published by: University of Minnesota Press. (2015)

Stable URL: <http://www.jstor.org/stable/10.5749/j.ctt13x1mnj.9>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://about.jstor.org/terms>



University of Minnesota Press is collaborating with JSTOR to digitize, preserve and extend access to *A Geology of Media*

5

FOSSIL FUTURES

As rocks of the Miocene or Eocene in places bear the imprint of monstrous creatures from those ages, so today arcades dot the metropolitan landscape like caves containing the fossil remains of a vanished monster: the consumer of the pre-imperial era of capitalism, the last dinosaur of Europe. On the walls of these caverns their immemorial flora, the commodity, luxuriates and enters, like cancerous tissue, into the most irregular combinations.

—WALTER BENJAMIN, *THE ARCADES PROJECT*

Waste like dinosaurs must return to dust or rust.

—ROBERT SMITHSON

Fossil Production, Silicon Valley to Shenzhen

This chapter follows the path of geology outward to space. It also moves from deep times to future times by speculating on the idea of future fossils, as a future temporality turned back to the current moment. The fossil is in this sense a question about the contemporary that expands across multiple times. We are forced to investigate the persistence of the fossil as a material monument that signals a radical challenge to prevailing notions of time. This happened in the early modern times, with fossils presented as material evidence that was incapable of fitting into the scheme of biblical time and also challenging views of nature of earlier scientific heroes such as Linnaeus, who, with his taxonomic mission, was happy to be referred to as the Second Adam. Outside the world of adams and eves, in which ways could the future fossils of media waste, the “anthropocenic (re-)fossilizations” (see chapter 3) be also such uneven

temporalities that force a consideration of how complex the time of the contemporary Anthropocene, in its obscenity, is?

If the current fossils from paleontological evidence to the fossil fuel layers are the things that mobilize the desires of contemporary imagination, how about the fossils we are producing now? What is the layer of dead matter residue that we are producing as future fossils? The earth is itself not a stable entity but constantly in a state of process. The body of the earth is a compilation machine, an assembly line, which offers a natural history of the changes over past decades of intensive industrial involvement in our planet. "Things like trash, construction debris, coal ash, dredged sediments, petroleum contamination, green lawns, decomposing bodies, and rock ballast not only alter the formation of soil but themselves form soil bodies, and in this respect are taxonomically indistinguishable from soil."¹

The soil bodies are paradoxically unnatural natural formations, which will assemble the current afterglow of the industrial world and digital culture into the synthetic geological future. The synthetic future of soil is enveloped in an environmental context, but it also is related to the fact of soil becoming a tradable entity, entering into circulation of not only the earth but also the monetary reality.²

Elements become isolated, analyzed, synthesized, and enter into circulation as deterritorialized bits of information that can be traded in complex, global ways. From soil to minerals to chemicals, their scientific framing and engineering is also a prelude to their status as commodities. The four elements persist and yet mutate into hybrid objects telling the tale of scientific, high-tech engineered capitalism.³ We have shifted from alchemy to chemistry. The periodic table is one of the most important reference points in the history of technological capitalism. The insides of computers are folded with their outsides in material ways; the abstract topologies of information are entwined with geophysical realities. The silicon of the contemporary computer world is one minor indicator of the other geophysical memories we will leave behind for the future archaeologists of media and environmental catastrophe. Let's start with some site-specific examples.

First up, a bit obviously, is Silicon Valley. Its brand and impact on digital economy are for sure beyond doubt, as is the aftereffect of the

chemical leaks affecting the groundwater and releasing, for example, trichloroethene. That was already a shock discovered in the 1980s: that the purified industries of computing were secretly just as dirty as the industrial ancestors that at least indicated danger with their smoke stacks.⁴ Now the Superfund sites of Silicon Valley remind of this toxic legacy: instead of the promises of brain-fueled computer capitalism, one is still left with the residue of chemicals, toxins, and the materiality of electronic culture. In the early 1980s, the digital industries were featured as the “oil business of the eighties.”⁵ Like oil has had its dirty sides, from environmental pollution to dirty wars, so does the manufacturing industry of computation get its hands dirty. This includes labor rights violations and dubious practices where proper laws don’t exist, historically moving from Silicon Valley to various locations in Asia. But this dirt also includes chemicals as the geological legacy of digital culture.⁶ Computer culture never really left the fossil (fuel) age anyway; the previous chapter spoke of *Coal Fired Computers* (YoHa), and in more factual terms, we can remind that “to produce a two-gram memory microchip, 1.3 kilograms of fossil fuels and materials are required.”⁷

So despite “the digital” carrying continuously the immaterial connotations of information, it is and always has been grounded and also territorialized.⁸

From prune and orchids to silicon, Silicon Valley changed gradually over the decades since the 1950s. By the 1980s, it had become a symbol of a new economy. By 2013, it had become a global brand but not always celebrated. Only recently, we witnessed the corporate commuter busses attacked for their symbolic role signaling of the toxic impact it had on the local areas. From “Fuck Off Google” to more elaborated articulations of the issue, Silicon Valley was not the solution but the problem. “While you guys live fat as hogs with your free 24/7 buffets, everyone else is scraping the bottom of their wallets, barely existing in this expensive world that you and your chums have helped create,”⁹ as one of the fliers of the protestors attacked. But perhaps the map on which Silicon Valley finally appeared was not only about the pollution of social and economic conditions of living. Perhaps there was another map that is invisible to the eye, the underground, which registers another toxicity of digital culture?

The underbelly of Silicon Valley is one of toxic capitalism. Of course, it is not merely a feature of that one specific territory but is also moved to other places of production of the global digital economy. Indeed, consider Shenzhen and Huaqiangbei, “the electronics component mecca,”¹⁰ as echoes of the Silicon Valley legacy, what has been branded “environmental racism and environmental injustice” by Pellow and Sun-Hee Park.¹¹

In a certain way, we can consider this legacy in relation to both space and time: the material production of a massive amount of electronics and the logistics of their shipments back and forth, as functional, cheaply produced hardware and to other directions as disused and sometimes broken obsolete media. The legacy points to the future fossil record for a robot media archaeologist interested in the paleontology of scrapped electronics, but it also forces us to consider what is our current relation to hardware at the moment. This is where death—but also living deads—features as part of current enthusiasm for discardability.

In the midst of the wider excitement for a global digital economy of software, some business correspondents, such as Jay Goldberg, have realized that hardware is dirt cheap and even “dead.”¹² His claim is less related to the Bruce Sterling–initiated proposal for a “Handbook of Deadmedia,” “a naturalist’s field guide for the communications palaeontologist,”¹³ than it is to observing a business opportunity.

Goldberg’s dead media business sense is focusing on the world of super cheap tablet computers he first encounters in China, then in the United States for forty dollars. For this particular story, it triggers a specific realization regarding business models and hardware—the latter becomes discardable, opening a whole new world of opportunities:

When I show this tablet to people in the industry, they have universally shared my shock. And then they always ask “Who made it?” My stock answer is “Who cares?” But the truth of it is that I do not know. There was no brand on the box or on the device. I have combed some of the internal documentation and cannot find an answer. This is how far the Shenzhen electronics complex has evolved. The hardware maker literally does not matter. Contract manufacturers can download a reference design from the chip

maker and build to suit customer orders. If I had 20,000 friends and an easy way to import these into the US, I would put my own name on it and hand them out as business cards or Chanukah gifts.¹⁴

The reduced price of the tablets means widespread availability even for niche uses: from waitresses to mechanics, elderly people to kids, tablets could become the necessary accessory in such visions that are astonished when realizing the business prospects. The visceral reaction by Goldberg is followed by rational calculations of what it might mean in the context of digital economy business models:

Once my heart started beating again, the first thing I thought was, "I thought the screen alone would cost more than \$45." My next thought was, "This is really bad news for anyone who makes computing hardware. . . .

No one can make money selling hardware anymore. The only way to make money with hardware is to sell something else and get consumers to pay for the whole device and experience.¹⁵

Even hardware gets drawn as part of the discourse of *experience* economy and the immaterial connotations it carries. Hardware seems to be immaterialized. Goldberg misses the point that hardware does *not* die, not even in the Sterling sense of unused dead media that become a sedimented layer of fossils left for quirky media archaeological digging. Instead, media technologies from monitors to game cartridges are abandoned, forgotten, stashed away, but retain their toxic materiality that surpasses the usual time scales we are used to in media studies. Such abandoned media devices are less about the time of use, or practices of users, and more the time and practices of disuse. It certainly would be interesting to write a history of cultural techniques of technological disuse.

Besides moving on from use to disuse, progress to failure, I want to remind of the chemical durations of metal materiality. Think of this idea as the media technological equivalent of the half-life of nuclear material, calculated in hundreds and thousands of years of hazard; in media technological contexts, it refers to the dangerous materials inside screen and computing technologies that are a risk to scrap workers as well as nature, such as the soil.

A utopia of cheap hardware produced in places of cheap labor indicates the creation of a new future layer of zombie media. Hence we can start to perceive these clusters as producing not only new sorts of gadgets of consumption, implied new business models, or just economic opportunities but also a layer of fossils of electronics. It means that a list of things produced equals another list of zombie media future fossils, an immense quantity of electronic culture that is indicative of new senses of futurity as well.

Oscilloscopes and multimeters, connectors of every shape and variety, LCDs and LEDs, motors, wheels and buttons, resistors, capacitors, miles of USB cables and row upon row of copper tape, soldering paste and every manner of specialized glue. Hundreds of stalls each with hundreds of components organized and displayed for browsing. You may never have seen a reel of PCB components for loading into pick-and-place machines. At Huaqiangbei you'll see thousands upon thousands of them.¹⁶

The visual image of immense piles of electronic rubble that the list provokes is one indication of an attempt to cognitively grasp the scale of production of digital culture. From visual arts such as Pieter Hugo's photography of bleak landscapes (see his "Permanent Error" work) to United Nations reports, there are various overlapping and reinforcing ways in which different institutions are trying to make sense of the contemporary conditions of technological waste. Often the images of solitary e-waste workers in non-Western locations, standing next to the piles of dead or zombie media, correspond to the tropes favored by the written journalistic descriptions: counting the mass of electronic waste per year (last year around fifty tons globally) or eventually as "a 15,000-mile line of 40-tonne lorries"¹⁷ full of phones, computers, monitors, electronic gadgets of all sorts. The United Nations action-step initiative is in this context a rather significant and comprehensive attempt to tackle the e-waste problem from policy, design, and, for instance, reuse and recycling practices perspectives so as to be able to address the dual issue of waste and critical material depletion.¹⁸

This chapter's perspective is, however, on fossils. These bodies of dying media technology are not merely disappearing as part of the soil

but constitute a defining mix in terms of their chemicals, hardware elements, metals, and more: something of a different sort of a dying body than the organic layer that condensates as part of the earth. This layer, we can speculate, will persist as an odd reminder of electronic culture and its entanglement with nature. This chapter is a discussion of different art projects and theoretical debates concerning (media) fossils, a sense of digital futurity and the temporal scales of digitality. Similarly as the modern scientific interest in fossils in the zoologist Georges Cuvier's early-nineteenth-century work tied them with the history of earth catastrophes,¹⁹ our chapter and its artistic examples speculate on the future environmental catastrophe we are producing now in terms of the environmental.

Professor Ichthyosaurus's Lesson

Fossils have been for a while part of the media and culture debates in conferences, festivals, and book pages. The deep time perspective on the earth and its media (see chapter 2) stems from the interest in paleontology. Sterling's media paleontology of dead media used similar ideas. The Atari games dump is the widely circulated story of thousands of E.T. and other game cartridges buried in early 1980s in Alamogordo in New Mexico, turning in 2013 and 2014 into a literal excavation and exhumation of dead media, even if enthusiasts first had to wait for testing of the landfill for hazardous chemicals such as methyl mercury, malathion, and DDT (see Figure 5). In April 2014, through concrete unearthing of media from the earth, plenty of examples of discarded materials were discovered.

Jennifer Gabrys's "natural history of electronics" is perhaps the most elaborated use of the notion of the fossil in the context of digital culture. She picks up on Benjamin's methodological focus on dead and decaying objects as a way to understand the material imaginary of commodity culture. Indeed, as Gabrys points out, Benjamin's natural history of commodities and capitalism was a paradoxical unnatural natural history, which focused on the material effects of the itself historically contingent modes of production and circulation.²⁰

In this context, for Gabrys too,

electronic fossils are in many ways indicative of the economies and ecologies of transience that course through these technologies.

Electronics are not only “matter,” unfolding through minerals, chemicals, bodies, soil, water, environments, and temporalities. They also provide traces of the economic, cultural, and political contexts in which they circulate.²¹

Fossils have been at the center of the new modern worldview at least since the nineteenth century: both geologists like Charles Lyell and biologists like Charles Darwin focused on the fossil as an object of analysis that opened up a book of fragments. The fossil was the buried temporal object that was a gateway to past times as a monument in the present. These are signals of the historicity of the planet condensed in the present and show the earth as a library as well as “a recording medium.”²² The fossil enthusiasm of the nineteenth century was visible in how geology mobilized the earth as a secret treasury of the past, with volcanoes as one source of disruption that sometimes fold the visible surface with the hidden depths of the planet. Lyell’s *Principles of Geology* (1830) preempts with its early geological scientific touch what Pink Floyd did poetically later with sound technologies in Pompeii (“Live in Pompeii,” 1971–72): in the shadow of Vesuvius and the wake of its magma to depict Pompeii as a place of frozen time and frozen bodies, but as ways to understand the overlapping temporalities where the past exists in the present as monument.²³ The magma is in such geological imagination the original time-based art process, which imprints us images as fossils.²⁴ In later parlance of the information age, we can say that fossils are the *data* that geology processes.²⁵

But the important thing and indication of the multitemporality of the fossil layer is really brought to light only in contemporary paleontology, which rethinks fossils through punctuated equilibrium. For Darwin in *Origin of Species* some decades later, following Lyell, the fossil record is like a book with only fragments left; it is only a fragmented part of a totality that cannot be discovered, and the only things scientists—and the contemporary living world—are left with are traces. However, for our contemporary scientists, such as Stephen Jay Gould and Niles Eldredge, the fossil layers’ seeming deficiencies, random jumps, and nonlinear nature are exactly the striking fact that demonstrates the essential: the archaic and the current are entangled through such fossil monuments. Instead of a uniform, slow, gradual evolution of the planet, from its geological record

to its life, we must consider the possibility of both as *punctuated equilibrium*:²⁶ abrupt changes and relative stasis, or in other words, coexisting different temporal orders of change, both as real.

Gould's critical recap of the arguments of early geologists is useful in conceptualizing the nature of contemporary media fossils. In a way, the early geologists did a dress rehearsal for the Anthropocene discussions now, some two hundred years later. Despite shortcomings corrected by more accurate recent theories of geological time and change, even early pioneers like Lyell were imagining possible pasts and futures without humans. This comes out strikingly well in a popular satirical image targeting Lyell's idea of a cyclicity of the geological. De la Bèche's image shows a future Professor Ichthyosaurus giving lessons about the past fossil humans as exotic of a memory as the *sauruses* discovered by paleontologists in the midst of the nineteenth-century fossil frenzy (Figure 12)!²⁷ Revisualize this into an image of the future professor showing fossil remains of not only humans but also their technological extensions. Who is her audience though?

The mid- and late-nineteenth-century geological imagination was constantly talking about the future. A fascination with archaeology, geology, and ruins was complemented with an imaginary of future ruins. Besides the enthusiasm for the archaeological excavations of antiquity, one was painting future perspectives of the contemporary imagined as a forthcoming excavation site of similar importance: Joseph Michael Gandy was invited to paint the Bank of England with a bird's-eye view of how it would look after hundreds of years of decay, abandoned to the mercy of natural forces. The piece was first exhibited in 1830. About a hundred years later, a similar fantasy of ruins as a sign of great civilizations was adopted in the architecture of the Third Reich in Nazi Germany. It was meant as a demand to build in such a way that leaves only honorable lasting ruins for future archaeologists: a theory of the value of ruins, as it was coined by Albert Speer.²⁸

Fiction such as H. G. Wells's *The Time Machine* (1895) created the Morlocks, far-future inhabitants of the underworld, machine operators of a slightly human sort. Evolutionary ideas from Darwin to Thomas Huxley had a penetrating impact on imagining the future of the planet and human species on and underground of the earth. Besides evolutionary

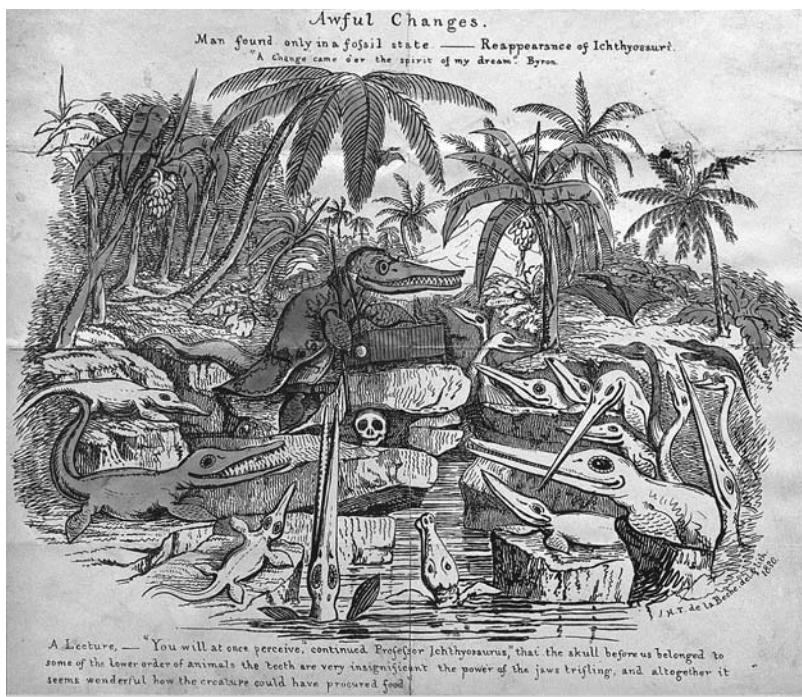


Figure 12. Professor Ichthyosaurus lecturing to an animal audience on fossilized human remains. Lithograph by Sir Henry de la Bèche, 1830, after his drawing. Wellcome Library, London.

remnants and underground life, “the . . . nineteenth century was haunted by that prospect of future burial.”²⁹ Also in Antonio Stoppani’s pre-Anthropocene account from 1873, something of a similar idea was employed. Besides predicting that new “anthropozoic” era that mankind had entered, he suggested to speculate “that a strange intelligence should come to study the Earth in a day when human progeny, such as populated ancient worlds, has disappeared completely.”³⁰ Instead of the past cyclical formations returning in new guises, the future holds an alien visitor who finds traces of the earth molded by modern science. Future geology becomes a narration of “history of human intelligence,” meaning science and technology growing on top of nature, animals, and plants. It represents a novel geological periodization projected and then retrojected from the future back onto our world. Professor Ichthyosaurus’s and Stoppani’s alien

intelligences are representatives of this new geology of non-humankind that starts in the nineteenth century, not just the twenty-first-century Anthropocene debate.

With Lyell and the birth of geology, we access the periodization of the earth's deep time into specific layers and their fossil remains. From the Paleocene to the Eocene, Oligocene, Miocene, Pliocene, and Pleistocene to the most recent Holocene before the discussed Anthropocene (or, as I prefer, the Anthrobscene): even if such present seemingly stable "layers" of uniform process, they are more like singular points indicating events; they are assemblages of specific fossil materials as well as accelerated by sometimes catastrophic changes.³¹ Stratification is not necessarily a smooth, slow process but multitemporal, speeding up, slowing down.

We need to address how fossils, whether of humans, dinosaurs, or indeed electronics, infuse with the archaic levels of the earth in terms of their electronic waste load and represent a "third nature" overlapped and entangled with the first and the second. These various natures of course refer to how McKenzie Wark has developed the Marxist conceptualization: the second nature is the sphere of consumer goods production characterized by wage labor relations in a capitalist society as well as the different modes of alienation that the exploitation of first nature brings about; the third nature is the logistical vector of information through which production of second nature takes a new informational pace.³² But as we see from the existence of media fossils, the spheres of two and three are as entangled with "first nature" as they are with each other. They are historically codetermining in a way that defies any clear-cut differences between the modern era of industrialization and the postmodern era of information.³³ In addition, the material residue of the third nature is visible in the hardware and waste it leaves behind, despite its ability to reach abstract informational levels; the abstract comes with its underground of energy costs and environmental burden that we are registering with various scientific and artistic means. If Benjamin already pitched the world of emerging consumer culture through the concept of "fossils,"³⁴ we can now ask what sort of fossil layer is defined by the technical media condition. Instead of the sudden apocalypse brought about by Vesuvius, our future fossils layers are piling up slowly but steadily as an emblem of an apocalypse in slow motion.

Telofossils

Media artist Grégory Chatonsky's *Telofossils* (2013), a collaboration with sculptor Dominique Sirois and sound artist Christophe Charles, picks up on this context of technologies, obsolescence, and fossils. The exhibition at the Museum of Contemporary Art in Taipei, Taiwan, focuses on the slow, poetic level of decay that characterizes technopolitical society and nature. The "future archaeologist" perspective that Chatonsky summons with immersive affective moods created in the exhibition's installations is akin to Manuel Delanda's figure of the future robot historian that gazes back at our current world emphasizing not the human agency of innovators but the agency of the increasingly automated and intelligent machine (as part of the military constellation).³⁵ The future archaeologist in Chatonsky's installations and immersive narrative is a displacement of the human from a temporal perspective (the future) and from the Outside (alien species):

Telofossils is a speculative fiction about this Earth without us. If another species arrives on Earth in thousands of years, what will it find? It will uncover from the ground billions of unknown objects with no apparent use, fossilized. It will certainly wonder why there are so many of them. A plastic bag can last hundreds of years when I only have 2,500 weeks left to live. This disproportion between the human life expectancy and the one of our technical artifacts gives a new dimension to our time. It will be a material trace for our memories. Making this absence and this disappearance visible is the goal of *Telofossils*, an impossible project.³⁶

The long-term perspective that starts from banalities of everyday consumer materials, like the plastic of the shopping bag, is an echo of Benjamin's style of narrating culture through its relations with the natural, but it is also embedded in the contemporary political context. In a mix of spatial narrative through escorting the exhibition viewer-participant through the rooms and spaces, Chatonsky creates affective states surrounded by signs, audiovisuals, and technologies of modernity. The mood management signals of affective atmospheres of the post-9/11 catastrophe that brands the past ten years of everyday life in consumer-surveillance societies. For Chatonsky, this mix is a necessary way to make sense of the

multitemporality of the looming catastrophe: the notion of the fossil addresses the slow stratification of a synthetic layer of technological rubbish. It refers to the aura of the accident³⁷ that surrounds the technological of past decades and hundreds of years and transposes it to the future. After the accident that was predetermined as part of the unsustainable technological modes of innovation, we can realize also why Chatonsky's work is about "telo" instead of just "tele" fossils; the "telifossil" hints more of the implicit "telos" of the processes of fossilization with a dose of mourning and sadness. Every technological invention is an invention of specific accidents that accompany it, reminded Virilio. Perhaps this is the true insight of Chatonsky's piece—to unfold speculative teleological hidden task of technologies as one to record our slow passing away; like technical media for the first time were able to record the dead and allow them to speak from the afterlife, they also in the digital form are the projection technologies of this telos: a projection toward the future as the canvas for the past fossils.

Indeed, for Chatonsky, the double role of technology becomes understood through future as a fossil: in his words, "they participate to the exhaustion of our planet but they also constitute traces of our existences."³⁸ The material contribution of technologies to the environmental damage to the planet is matched by their role as carriers of a memory of the past. They are in this sense "monuments" like briefly mentioned earlier concerning fossils. By their material duration, they insist on living after their use period (see again the Appendix to this book). And they also carry with them the potential to trace the existence of the world that was around them, including human cultures. It is recorded in the storage devices of technical media microtemporalities of hard drives (summoned in one installation piece in Chatonsky's exhibition through a broken hard drive) as much as it is in the chemical composition of man-made artifacts (Figure 13).

Telifossils is a project about time, and it is pitched as an archaeological and archival investigation of the future. The ways in which media archaeology has offered new insights into media cultural temporality cannot be ignored. Erkki Huhtamo's way of arguing for the cyclical and recurring nature of media culture through its narratives and topoi can be related with Zielinski's deep times (chapter 2) and Wolfgang Ernst's

microtemporal investigations (see chapter 1). Also Kittler's insistency to see media history through its material contexts that depict the human agent only as an aftereffect might need to be radicalized to a media geological history of technology: that Man is the aftereffect of the geological durations, mineral excavations, metal affects (Delanda), that catalyze technological reactions and social events.

An archaeology of the future has a double function in Chatonsky's work. On one hand, it reminds of the ways in which memory is always a remediated material event: memory is always a monument and inscription, whether that happens on the random-access principles of magnetic storage media like hard drives or in the still experimental modes of storage in biological material like bacteria. The future memories might be embedded in the archaic materiality of the organic, such as bacteria and cells. And for certain, the fossilized remains of the past from some three hundred to four hundred million years ago still burn to make data circulate in contemporary network computing and big data mining, despite the warnings from Greenpeace: the Internet companies "are powering the twenty-first-century data centers that are the engine of



Figure 13. A close-up from Grégory Chatonsky and Dominique Sirois's installation *Telofossils*, 2012. Courtesy of Xpo Gallery.

the Internet economy with nineteenth- and twentieth-century coal and nuclear power,”³⁹ demonstrating the complex temporal layers of digital technology itself. New media, archaic power.

On the other hand, Chatonsky’s interest in memories has to do with the future and what we can imagine. It is about archaeologies of the future, partly in the sense that Fredric Jameson talks about the link between imaginaries and modes of social production. Also imagination, and imagination of futures in the plural, is tied to the current economic and political contexts. Jameson writes in *Archaeologies of the Future*, lamenting on this impossibility to think outside capitalism, “What is crippling is not the presence of an enemy but rather the universal belief, not only that this tendency is irreversible, but that the historic alternatives to capitalism have been proven unviable and impossible, and that no other socioeconomic system is conceivable, let alone practically available.”⁴⁰ Chatonsky’s way of writing the future fossil layer through the present concerns in technologically fueled crisis of political credibility—visible in the various measures of surveillance, control, and (in)security of the post-9/11 planet—marks it as a work that is, despite the aspects of affective mourning, actually still keen to investigate how to imagine alternative futurities. Hence the fossils of the future are the ones we live among, and in this speculative fiction, the extrapolation of current technopolitics is returned to us via memories of the future. This link of present and the forthcoming is implicitly there in any kind of an apocalyptic future scenario. The question is, why are we imagining now such postextinction futures, worlds that are mediated and *in medias res*—a mediated technological future?

The notion of telofossils as employed by this imagined future is one sort of a continuation of “paleofutures.” It refers to a transposition of the speculative and the archaeological fragment to the future and a variation of the imagined future-theme. It parallels with the imaginary media discourse as much as it comes close to design fictions as one speculative methodology of creative practice. Bruce Sterling’s interest in it as “the reserve of historical ideas, visions and projections of the future”⁴¹ is one clear indication of a field of relevant research, and it would not be far-fetched to claim that Chatonsky’s fabulation of the future archaeologist is one way to extend design fictions. Paleofuturism is most clearly articulated

in the blog *Paleofuture* by Matt Novak:⁴² it maintains a discourse of past futures that are the fossils of the contemporary—a perspective on the speculative nature of scientific and technological discourse in the twentieth century that fuses the times of future and deep time so as to create the weird mixed temporality that brands technological culture. The emphasis on the current and the new in contemporary media culture becomes one of the objects of critique: Zielinski's notes against “psychopathia medialis”⁴³ of standardization and the political critique by Jameson are important ways to understand what in this chapter and in this book amount to the environmental geology of media—the fossils of paleofuturism are the aftereffects of the increasing piles of waste, and the melancholic postapocalyptic scenario painted by Chatonsky likens the future of the present not to a progress-inspired myth of cybernetic control of nature through technology but to a massive accident that happened because of technology. Virilio, the primary theorist of the accident, spoke also of gray ecology, which comes with the accelerating tendencies of modern technical media: a reframing of relations and disappearance of distances that have a fundamental effect on our aesthetic—ethical stance in the world.⁴⁴ However, gray is also the color of the covers of hardware and surroundings of the metallic parts as well as plastics, which create a further surface of the planet. It is another layer that becomes at the same time an historical and geological index of advanced technological culture. This gray ecology is the ecology of media technical fossils—telofossils.

The notion of the fossil is a hint at a future grounded in dysfunctional technology: indeed, similarly as in new insights in technology and repair studies, we need to be able to rethink the modernist fantasies (also visible in the historical maps of past imaginary futures in paleofuturism) of technology as clean, smooth, and progressing and replace such with the primacy of the accident. Scholars such as Steven Jackson and Lisa Parks have outlined this in brilliant ways. Following Jackson, we need to be also thinking of future fossils as “exercise[s] in broken world thinking,”⁴⁵ which is branded by the post-9/11 scenarios articulated by Chatonsky's art and design practice. If furthermore read in parallel with Jackson's words, it means that “we take erosion, breakdown, and decay, rather than novelty, growth, and progress, as our starting points in thinking through the nature, use, and effects of information technology and new media.” Hence a truly

paleofuturistic take on fossilization of mediatic technology starts from this scenario: things broken down, abandoned, and decaying as part of the future fossils of medianatures (cf. chapter 1).

Outer Space Fossils

I won't go into the issues of repair culture, as articulated by Parks, although it is an important step in acknowledging the geopolitical and postcolonial stakes in this fresh perspective to broken technologies. Instead of Eurocentric myths, it suggests a different take on media history and archaeology through its Others and the dysfunctional.⁴⁶ A focus on repair is what dislocates the place of technology from the Western emphasis on a wider set of cultural techniques, including repair, for instance, in Ghana and Namibia. It also illuminates bigger questions about infrastructures. Technology is itself an increasingly efficient vessel for establishing neo-colonial structures of corporate presence in African countries; from infrastructure to end users, Africa is the next continent of consumers for the global corporations. This parallels the other work of technological development and resources: the corporate rush to the energy and mineral reserves also in Africa.

Fossils present a temporal perspective to current digital culture, and they can be used to speculate on geographical dislocations of where we find media practices. The speculation of media fossil futures can be matched with a different sort of experimental idea that exhibits "a displaced fossil record."⁴⁷ Trevor Paglen's *The Last Pictures* project (2012) mobilizes a concrete satellite-enabled art project but also speculates with the multiplicity of temporalities that constitute a set of very important questions in regard to memory, media, and fossils.

In short, Paglen—known for his politically engaged photographic work that fuses art, technology, and visual culture—collaborated with a set of material scientists to create what the project calls an ultra-archival disc (see Figure 14). Its lifetime is designed to surpass what we usually consider human archival time of some thousands of years and instead promises a life of billions of years for the one hundred photographs that are etched onto the silicon wafer.⁴⁸ It is not a digital artifact in the usual sense of binary coding of images on silicon, but it brings to mind questions of technological memory and sustainability of the cultural heritage.

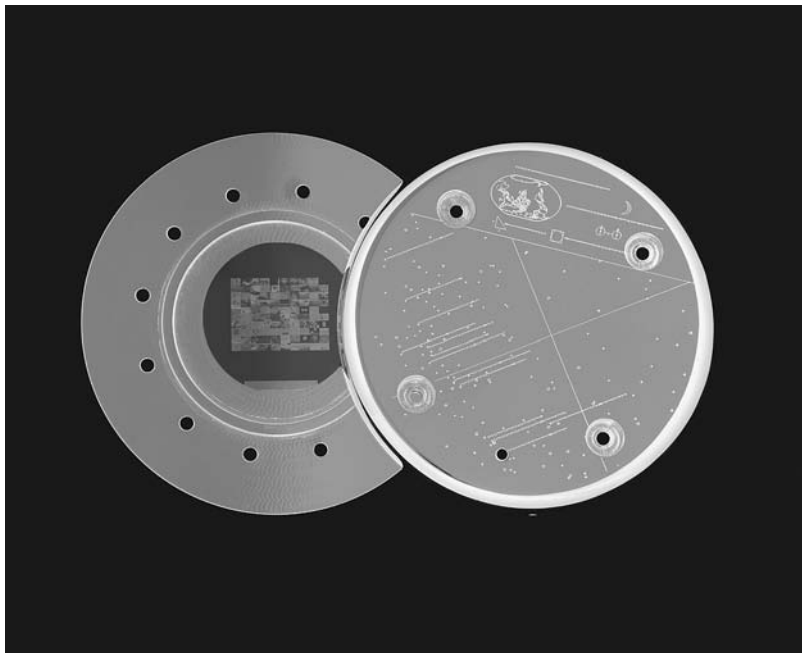


Figure 14. Trevor Paglen's project included the development of a special ultra-archival disc. Courtesy of the artist; Metro Pictures, New York; Altman Siegel, San Francisco; Galerie Thomas Zander, Cologne.

Paglen's project can be seen as a reference to the 1977 Voyager Golden Record, which on a phonograph record sent audiovisual material to space. As Ryan Bishop has wonderfully argued, the Golden Record already constituted an interplanetary media archaeological act in sending the disc with a stylus to outer space, which, if one day would accidentally happen to crash back to earth would constitute a piece of dead media returning from its galactic trip.⁴⁹ Whereas Bishop tracks the media historical connections of the Golden Record to the analog sound technologies of the vocoder, revealing links with Laurie Anderson and, of course, Wendy Carlos, we should also focus on the vessel itself. The medium is the message, but in this case, we can scale up from the obvious medium of the phonograph and even the constant data traffic between the vessel and the Deep Space Network to the spaceship itself. Voyager I as a piece of technology will become space junk by 2025, when it runs out of energy and

slowly drifts outside the heliopause as a silent reminder of what happens when technology stops working and media stop mediating.

Moving from Voyager to EchoStar XVI, Paglen's satellite project has various angles through which we could approach it. I am focusing less on the images and more on the material-temporal aspects. The speculative billions of years of future time reminds of the material waste aspects that such an archival fantasy has. In a way, the existence of an archive meant for a nonhuman future is itself a meditation on the paradoxical task of cultural heritage to outlast humans as well as the material and technological support of the archive itself. In this case, the specially made disc transported to geostationary orbit with the EchoStar XVI turns our attention from the object to its support. The system of satellites is one of rocket-fueled technological mediation that guarantees that we have media entertainment on a global scale—but is also crucial to the military-surveillance complex, extending its reach to a scale that makes the earth a geographical, geopolitical, and geophysical target:

Since 1963, more than eight hundred spacecraft have been launched into geosynchronous orbit, forming a man-made ring of satellites around the Earth. These satellites are destined to become the longest-lasting artifacts of human civilization, quietly floating through space long after every trace of humanity has disappeared from the planet.⁵⁰

The material memory of the earth continues outside its surface. The extension of technology to space is a sort of return of the various materials and minerals to a geosynchronous orbit. Besides the orbit of functioning satellites, Paglen turns our attention to the circular temporality of the orbit slightly higher to that. The junk orbit is one of future media fossils, which as a project fuses a deep time interest with the technological realities of contemporary geopolitics. The EchoStar XVI itself is an important media relay for the fifteen years it will continue transmitting images—an approximate ten trillion—but it becomes a different sort of media object when it is moved to the graveyard orbit of zombie media “so far from earth that the derelict spacecraft will never decay.”⁵¹

It is this slightly higher orbit that sustains a new geological layer of technological rubbish, media fossils that have a geological duration,

but not only on earth's surface or underground. The escape velocity⁵² exports geological earth in the form of technological artifacts thousands of miles above the surface, first as a media relay that extends the electromagnetic communication sphere, second as a fossil sphere of dead and zombie media technologies, which in Paglen's project are matched with the time of the solar system. Imagining the orbit and, for example, lunar space as a cemetery illustrates one aspect of how our junk becomes an odd memorial and part of human cultural heritage outside the earth.⁵³ But the space, space rocks, or the moon are not only cemeteries—not of dead media objects nor of other human remains. In addition, they are like the earth itself, increasingly imagined (and imaged) as a resource. In a way, this is not a new phenomenon but more of a rediscovery of earlier interest in space as the next frontier of the sort that escorted the enthusiasm for a scientific calculation and mapping of the earth into a resource. The Cold War space race fueled by geopolitical aims, but also mapping the material constitution of the moon, meant that despite that it was rendered free from military activity (with the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies), the idea of being able to stake a territorial claim might have enormous benefit for the military sector. Similarly as the globe, for instance, around the north pole, is intensively territorialized as a continuation of the Cold War,⁵⁴ it is no wonder that an interest in the outerplanetary resources is again resurfacing.

Richard Seymour suggests that "the outer space really is the final frontier for capitalism,"⁵⁵ referring both to China's recent moon mission and to Rosa Luxemburg's famous theoretization that capitalism works by folding its outsides as its resource. The interest in space might be because of the energy promises in helium-3, but to be honest, the moon is not the only rock of interest to the technologically advanced geopolitics of our times. Also asteroids are important. For instance, platinum, iridium, palladium, and gold are believed to be found in abundant quantities in such space rocks, but even more important might be water, silicon, and, for instance, nickel.⁵⁶ Indeed, companies are able to bypass the 1967 legislation because of their status as private mining corporations, such as Deep Space Industries or the earlier founded Planetary Resources Inc. (behind the venture, among other investors, also are Google's Larry Page and Eric

Schmidt). The focus on asteroids shifts from the narrativization of the end of life as we know it—scenarios of apocalyptic proportion of past years of Hollywood audiovisuals—and concentrates more on the resource basis for future technological competition. The interest in geology that has mapped the earth as a resource leading to the recent years of digital culture devices, hungry for minerals, metals, and energy, is being replicated now outside our planetary scale. In the midst of the satellites, relaying massive network transmissions of entertainment and military content, we have the future plans of geological surveys and mining expanded much beyond the underground of the earth, from the deep time of the media of mining its underground to the space of geological objects, within reach exactly because of the development of advanced (space) technologies.

The Last Pictures establishes an aesthetic framework to understand this wider context of geology of media reaching outside the globe. In many ways, we are increasingly conscious of the mediasphere as significantly defined by the orbital.⁵⁷ But discussing the orbital in terms of geology—both fossils from the dying technological waste and the resources from asteroids—is what opens a new horizon for a media materialist analysis. Paglen makes explicit this link with the geological sphere and the influence of the Anthropocene reaching out thousands of miles high above earth itself. His photography has a relation to the resourcing of the geophysical sphere as part of the geopolitical (military) missions of past decades and how scientific visual worlds demonstrate the intertwining of aesthetics with power.

As Brooke Belisle points out, already Paglen's earlier work, a photographic diptych *Artifacts* (2010) (see Figure 1), works through relating geological formations and astronomical space.⁵⁸ It offers a photographic argument concerning the nineteenth-century temporalization of geology (deep time) and the ongoing spatialization of space (deep space) in a way that entangles also the extraterrestrial into a geological discourse. Belisle is able to show the geological connotations of Paglen's interests: the outer space and satellite orbits as the future fossils of human-made space debris and the focus on the earth's topology from geological sciences to geo-engineering of canals and other formations that tied industrialization, colonialism, and capitalist globalizing logistics to the opening up of deep time. This supports the argument in this book concerning the deep time

of the media, of which some of Paglen's visual themes are good examples. From the geological strata of Canyon de Chelly in Arizona to the night sky of strata of light, as traces from satellites, *Artifacts* paves the way for the Anthropocene that is further investigated in *The Last Pictures*. The historical genealogy of photography shows the close links the new visual medium had with the mapping of the geophysical; U.S. Geological and Geographical Surveys were closely linked with the media of visualization since the nineteenth century, as Belisle brings out in the context of Paglen's practice. The geological ground was dug through, mined but also made flat and into an information surface with the aid of the new technical medium of photography connected to various other techniques, such as air balloons and aerial photography.

But besides the aerial, the militarized technological imaginary has as much been haunted with the necessity of trying to see the underground. As Ryan Bishop skillfully shows, this penetration of the underground

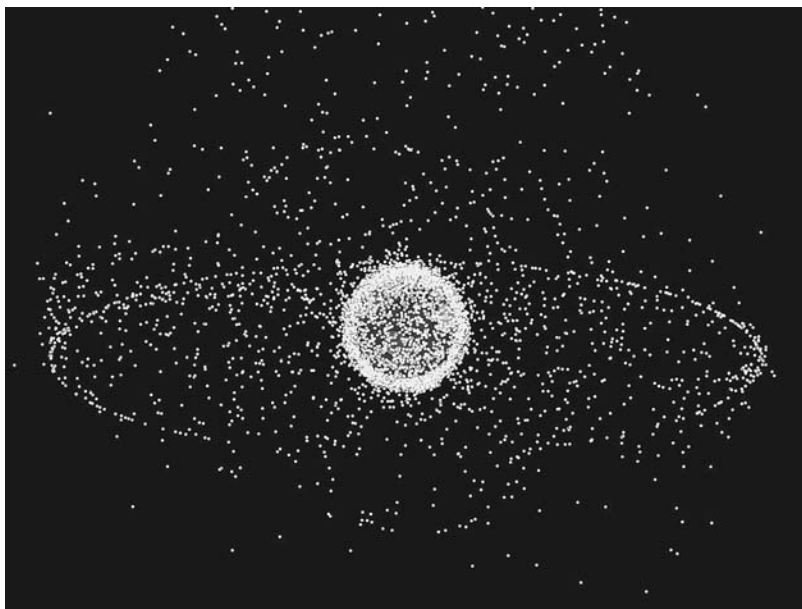


Figure 15. Orbital debris visualizations give a sense of the vast quantity of objects that form an external geotechnological layer circulating the earth. This refers to the layer of living dead, obsolete technological objects in circulation in the geosynchronous region (around 35,785 kilometers altitude). Image from NASA Orbital Debris Program Office.

layer is as important a step in techniques of visualization as the surveys that produced the flatness of the ground. Perhaps we could say that the geological discoveries of the nineteenth century, not least Lyell's *Principles of Geology* in the 1830s, prescribed the fantasy of the earth of deep time and deep space, paralleled in the outer space that is seen as a sort of geological frontier.⁵⁹ In both cases, the military–corporate enthusiasm was the perfect engine for the aesthetic and epistemological mapping, demonstrating again the medianatures double link: the media technologies giving us the real and imagined visions of the geophysical reality available for mining are the ones of future technological fossils of debris and waste.

Media Temporalities: The Media-Arche-Fossil

This chapter has continued the earlier focus on temporality of the geology of media. The time of fossils is one of tear and wear, of decay and rust, which characterize our notions of memory as much as they do the physical temporality of materials. Indeed, the so-called geological turn is at least as much about time as it is about materiality of space. The different temporal scales of debris raise questions that are fundamental for any analytic framework we use to make sense of the technologically stretched as part of deep times, deep spaces. The slowness of the geological strata and the earth's different spheres are paralleled by the distances of asteroids' travels. Even interstellar objects are able to enter the fantasy framework of contemporary capitalist mining as much as the underground persists as the military–corporate sector imagining not only a total reach over human communications but a transparency of the earth itself with new visualization and sonification techniques. The underground is of importance because of its relation to the infrastructures that sustain the operational readiness of any (military) organization on the ground. The “underground . . . is the final frontier,” as the Geospatial corporation puts it,⁶⁰ offering a different emphasis on what Seymour argues is the final frontier. Perhaps both are correct; perhaps it is more generally just the geological and the geophysical—the abstract geology deterritorialized from first nature—that is the final frontier.

However, the seemingly spatial axis of the earth opens up also a temporal axis. Trevor Paglen's interest is as much in the slowness of earth's duration as it is in our contribution to what will play out as (from our

human perspective) a slow impact over thousands of years: the climate change, nuclear waste stored underground, and technological debris. But slowness and acceleration become entangled in complex ways. For Paglen, not just the surface of the planet but time itself is uneven. We reshape the planet through temporal modification. Capital and military interests are the prime movers, continues Paglen:

Mostly, we think about this in terms of speeding up time (increasing capitalist turnover times, labor productivity, financial transactions in the case of capital, and things like GPS targeting and hypersonic cruise missiles in the case of militarism). But in addition to the industrial annihilation of space with time that we see, the nineteenth century and early twentieth century marks the advent of the so-called “Anthropocene Age,” a moment in earth’s history when humans begin moving more sediment than traditional geomorphic processes (erosion, glaciation, etc. . .). In the Anthropocene, things like real-estate markets become geomorphic agents, because fluctuations in housing prices, for example, determine how huge amounts of sediment gets [*sic*] moved across the planet. My point is that human societies are both speeding up and slowing down at the same time. One consequence of these “anthropogeomorphic” processes is that the effects of our activities are played out over longer and longer time periods: one example is climate change: we are setting earth processes in motion that are going to play out over a hundreds, of [*sic*] not thousands of years.⁶¹

Paglen’s ideas resonate with contemporary analyses of capitalism and time and could be seen as a relevant comment on recent accelerationism discussions. They connect to psychogeography but entangle with geophysics (see chapter 2): urban realities such as housing prices have an effect where building materials, production, energy needs, get logistically addressed.

The preceding quotation is also related to a media archaeology of visualization technologies. After Galileo’s seventeenth-century telescopic opening of space around our globe, William Herschel’s astronomical observations gave us a sense of geological deep times expanded into deep

space in the nineteenth century. The longer histories of space as an object constituted by visual technologies demonstrate what Paglen calls time's unevenness. Even Herschel's telescope-enhanced views to space framed it in terms of time and as an emblem of the duration of the universe: the millions of years of light traveling across space. "A telescope with the power of penetrating into space has also, as it may be called, a power of penetrating into time past."⁶² The geological and astronomical interests of knowledge and media of perception conjoin in John Durham Peters's apt term *paleoscopes*: telescopes gaze into space as well as time.

But media don't just observe, they actively guide the way the world spins. What Paglen emphasizes with the unevenness of time (as a productive force, even if not with necessarily positive outcomes when it comes to the survival of a significant amount of the planet's life) is that also capitalism is able to accelerate such processes with its own logic, whether abstract housing price fluctuations or the massive shifts of geological material because of differing reasons tied to exchange value processes that otherwise might hide the actual environmental–ecological relations involved in the process of abstraction.

The notion of fossil relates to contemporary discussions of the non-human in philosophy and the so-called noncorrelationist philosophy. In Quentin Meillassoux's take, the notions of the "arche-fossil" and the ancestral become mobilized as a philosophical thought-experiment with strong ontological impact. Turning toward the fossil is part of Meillassoux's task of finding an alternative to the Kantian critical thought that is interested in the correlated—in other words, the world only as it is given to us in the relation to our critical faculties of thought. The scientifically proved and exactly dated existence of fossils that predate the human being as a species is also a question of where the thinking of such things that predate thinking stands. The *arche-fossil* and *fossil-matter* terms become ways to indicate "the existence of an ancestral reality or event, one that is anterior to terrestrial life."⁶³ Indeed, for Meillassoux, this notion refers to the "material support on the basis of which the experiments that yield estimates of ancestral phenomena proceed,"⁶⁴ whether it is an isotope or light emission from deep space. The arche-fossil becomes a way to realize the existence of a reality outside thought that does not indeed necessarily correlate with what thought is: the faculties of the human. This existence

of a rift between the human and the nonhuman is an important influence on things that are not only manifested to us but “intrawordly occurrences,”⁶⁵ to use Meillassoux’s term.

It’s, however, not a new discovery that the nonhuman exists and that the flaws in so-called correlationist thought need to be addressed. Already the likes of Donna Haraway, Michel Serres, and the new materialists Rosi Braidotti and Manuel Delanda have written about related things since the 1980s and 1990s. With Braidotti, this was also connected to arguments in the emerging science and technology studies field as well as feminist theory. In a way, the legacy of new materialism reminds that perhaps it is not merely the human as “thinking being” we should be thinking about but the various other modalities of which the human consists; the multiple temporalities that are being coordinated in ways that make time uneven but constantly modified; the fossil as both a material support, as Meillassoux argues, and a deeply challenging entity that is definitely irreducible to how it manifests to us. And yet the ways in which we have thought and acted in the world have had a definite impact on the future fossils that are material supports for something else. The discussions of fossils in this chapter, and in relation to the soil and dust earlier, remind that such nonhuman things are compilations of heterogeneous transformations as part of temporally formed sediments. The soil is part of the gradual formation of deeper layers of the planet.

The various ideas circulating around the concept of the Anthropocene also in art practices, such as Chatonsky’s and Paglen’s, actually remind that their view of media and technology acknowledges the human impact. The human-made becomes a manifestation of the infrawordly, irreducible to thinking. But the practices remain carefully aware of the multiple scales that are constantly coordinated in this assembly. Hence the focus on trash, media waste, and, in general, the industrial impact on the planet is tightly related to the philosophical ideas concerning fossils as much as they are to a necessity to account for the role of media and technology. The significant political questions we are now facing must be somehow temporally synchronized with the longer-term durations to realize the connections political economy and, for instance, exchange relations, technological modes of production, and the immaterialization of labor have with geophysical realities, fossil-matter, and what I will call the *media-arche-fossils*. This notion refers to the media technological stratum, which

is irreducible to the human and yet partly supports and conditions it alongside various aspects of the earth and its outer space geological layers. It refers back to the notion of medianatures I used earlier. In other words, perhaps instead of dismissing relations and mediations, we need carefully to refine what we mean by media and communication in the noncorrelationist as well as new materialist contexts of contemporary media culture.⁶⁶

Notions of temporality must escape any human-obsessed vocabulary and enter into a closer proximity with the fossil. The deep time even in its historical form is a mode of scientific temporality that allows imagination of planetary time without humans. It presents epochs that stratify dynamics of the earth (see chapter 2) but also in later geological research reminding that the periods are formed of dynamic, even catastrophic events: a punctuated equilibrium.

If history has been the discourse concerning narratives of men and their lives, then fossils set the scene for a different challenge: a world without humans, and narrativizing a future-present in which media and residues of waste might be the only monuments we left behind. In some ways, this is acknowledged by Tim Morton: also on the level of design, we must necessarily think of the other-times than that of humans—from thousands to hundreds of thousands of years and, for instance, accounting for things such as “Plutonium 239, which remains dangerously radioactive for 24,100 years.”⁶⁷

In the humanities and social sciences, we are engaging with this challenge, which comes under different names: the Anthropocene, the non-human, media materialism, the posthuman, and so forth. Discussions of microtemporality (see chapter 1) are trying to present a technical media temporality different to narrative writing of media history (from the human perspective and for the humans⁶⁸); discussions of archives are turning toward the constitutive role of data centers as the infrastructural support for memory;⁶⁹ furthermore, data centers are themselves also geophysically determined organizations, reliant on energy and efficient cooling systems. The geological is one way to account for the ecological relations in how they address change across scales: the slow duration of deep times but also the accelerated microtemporalities that govern the algorithmic world of communication and trading reliant on as much as *about* the planet and its resources. Acceleration, deceleration.

This page intentionally left blank