

Chapter Title: PREFACE

Book Title: A Geology of Media

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Published by: University of Minnesota Press. (2015)

Stable URL: <http://www.jstor.org/stable/10.5749/j.ctt13x1mnj.3>

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PREFACE

In *Principles of Geology*, Charles Lyell offers one of the early definitions of the discipline:

Geology is the science which investigates the successive changes that have taken place in the organic and the inorganic kingdoms of nature; it enquires into the causes of these changes, and the influence which they have exerted in modifying the surface and external structure of the planet.¹

This iconic take from 1830 outlines geology as one of the main disciplines of planetary inquiry, leaving the regime of morals to the humanities. It is both an emblem of the division of labor in the academia and a genealogical record that could not be more central to our concerns. The geological manifests in earthquakes, mass extinction of species, pollution of the globe, and the debates about the Anthropocene, which demonstrates that morals, culture, and geology after all have something to do with each other. The book argues that the world of thought, senses, sensation, perception, customs, practices, habits, and human embodiment is not unrelated to the world of geological strata, climates, the earth, and the massive durations of change that seem to mock the timescales of our petty affairs. And yet, the human affairs have demonstrated an impact. Science and engineering has a significant impact on the earth. The idealized object of knowledge itself registers the observing gaze that was supposed to be at a distance. Geoengineering is one practice of intertwined naturecultures,

and our continuous trespassing over the boundaries of sciences and humanities cannot be neglected by closing our eyes and thinking of semiotics. The relations to the earth are also part of the social relations of labor and exploitation that characterized emerging industrial capitalism of the nineteenth century as much as they characterize contemporary digital capitalism of the twenty-first century from mining minerals, geopolitics of the hunt for energy, and material resources to the factories of production of computational equipment.

This short book is about scientific cultures, technological reality, and artistic perspectives. It engages with science and technology as one pertinent multidisciplinary context for media studies and media art history. It does not claim to be a full-fledged account of the relations of geology and technology. However, it offers an insight relevant to many of us working in the field of media, arts, and contemporary technology studies, including media archaeology.

There is more mining than data mining in *A Geology of Media*. More specifically, it is interested in the connections of media technologies, their materiality, hardware, and energy, with the geophysical nature: nature affords and bears the weight of media culture, from metals and minerals to its waste load. The official Geological Surveys might be an odd place to start media analysis, but they do reveal the backstory of technological culture: the geopolitically important scientific mapping of resources from copper to uranium, oil to nickel, bauxite (necessary for aluminum) to a long list of rare earth minerals. One also finds a mix of nation-state interests, scientific institutions, and, of course, military needs ever so tightly interlinked since the nineteenth century. One is led to consider the systematic laboratorization of everyday culture: even the mundane is produced through a mix of the archaic underworld and the refined scientific process. Even if cultural and media theorists are now aware of the importance of minerals such as coltan (tantalum), it was actually already before digital culture that this specific mineral (often mined in the war-ridden territories of Congo) became mapped as part of the geophysical politics of the twentieth century: “The U.S. Bureau of Mines observed that these materials were ‘among the rare metals most vital in 1952 to the United States defense program’”² because of tantalum’s (and columbium’s) usefulness for special “high-strength steel alloys.”³

The book was finished primarily in Istanbul in 2013 and early 2014, a city where one has a privileged view to some of the issues that we face with technological projects and disastrous environmental consequences. Such are often underpinned by shortsighted and just blatantly exploitative violent politics. The story, and the book, was started during the Gezi protests of summer 2013, sparked off by an environmental protest but resonant of a wider political situation where issues of capitalism, religion, technology, knowledge, and the environment folded into a complex historical event. Istanbul is a tectonic city, sitting on top of geological formations promising another major earthquake in the future. It is a city branded by massive geologically significant building projects. Some are already ready, some are in planning. The recently opened Marmaray tunnel connected the two continents through a tunnel under the Bosphorus; a canal project suggests to link the Black Sea with the Marmara Sea; a lot of the projects are reminiscent of the national engineering of modernity but also now the corporate capital investment in this geopolitically important region. But the protests were also highlighting the aspects that tie location to politics, the life of the earth with increasingly authoritarian ruling powers with corporate interests in the construction business and other businesses. The events demonstrated the impossibility of detaching the political from the natural, the geopolitical from the geological. The short-term political struggles had to do with political freedoms as much as with the awareness of what would happen if some of the massive building projects, including a new airport and a third bridge, would wipe out important parts of the forestry around Istanbul as well as creating extremely dangerous risks to the underground water resources of the city.

This political situation and its link with capitalism was present already in the nineteenth-century evaluation of the changing modes of production. Of course the environmental catastrophe is not merely a capitalist aftereffect. We should not ignore the impact “real socialism” of the twentieth century left in the natural record as radioactive radiation and industrial traces in soil and rivers. But there is a connection to the capitalist intensification of modes of production with the necessity to expand into new resource bases to guarantee growth. What we now perceive as the environmental catastrophe at times branded as the “Anthropocene” of human impact on the planet matches in some periodization also what

Marx and Engels narrativize as a crucial political economic shift. From *The Communist Manifesto*, in 1848:

The bourgeoisie, during its rule of scarce 100 years, has created more massive and more colossal productive forces than have all preceding generations together. Subjection of nature's forces to man, machinery, application of chemistry to industry and agriculture, steam-navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalisation of rivers, whole populations conjured out of the ground—what earlier century had even a presentiment that such productive forces slumbered in the lap of social labour?⁴

Marx and Engels's political characterization of capitalism as a mode of mobilizing science and engineering into productive forces is also what now we live as the aftereffect coined the "Anthropocene." The modern project of ruling over nature understood as resource was based on a division of the two—the Social and the Natural—but it always leaked. Bruno Latour constantly has reminded of the impossibility of dividing Nature from Culture. We have various names for the entanglements of the natural–geophysical, including Gaia and the Anthropocene; but both indicate the arrival of something new that points out as insufficient any Modern attempt to name the two, Nature and Culture, separately.⁵

Yet we need to remember that nothing necessarily *arrived*. The geological past in its persistent slowness; the earlier accounts of the Anthropocene before its time in the nineteenth century by Antonio Stoppani (the Anthropozoic) and by George P. Marsh;⁶ the early phases of the scientific and technological systems, such as meteorology, that visualized and modeled the natural planet as a global system—they were already there.⁷ In 1873, in his *Corso di Geologia*, Stoppani paints an image of the human as an inventor who penetrates the earth, the sea, and the air with his technologies and builds from and on the earth's already existing strata.⁸ The future fossil layer is already in Stoppani's analysis branded by human technological and chemical traces. Humans leave their mark, and the earth carries it forward as an archive.

The supposedly unexpected event of the Anthropocene had already arrived beforehand. These sudden revelations embedded in geological

slowness offer a view both to the historical layers of discourse concerning technology, waste, and time and the geological realities where we collect and dispose of resources. Stoppani's vision of the earth archive is the afterglow of the scientific and technological culture. It's the trash in midst of which we live. And it's the trash we have to sort out in case there would be a human future, in the midst of our constitutive nonhuman fellows.

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