

to address the current ubiquitous digital media culture and the speeds at which it folds as part of the human, without being accessible through human senses. See Mark B. N. Hansen, *Feed Forward: On the Future of the Twenty-first Century Media* (Chicago: University of Chicago Press, forthcoming 2014). At the other scale, the duration of climatic and geological timescales has to be addressed. Besides this book on geology, see Claire Colebrook on extinction and the weird temporalities of nature and knowledge of nature. Colebrook, "Framing the End of Species," in *Extinction: Living Books about Life* (London: Open Humanities Press, 2011), <http://www.livingbooksaboutlife.org/books/Extinction/Introduction>.

26. Peters, "Space, Time, and Communication Media."

27. Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, Mass.: The MIT Press, 2005), 174.

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A Media History of Matter: From Scrap Metal to Zombie Media

Throughout this essay I am interested in alternative accounts of how to talk about the materiality of media technology. One aspect, with a concrete ecological edge, is the acknowledgment of the growing waste problem resulting from discarded media technologies. And another aspect relates to energy and power as already mentioned above.¹ Indeed, what I want to map as the alternative deep time relates to geology in the fundamental sense of the anthropocene. Crutzen's original pitch offered it as a transversal map across various domains: from nitrogen fertilizers in the soil to nitric oxide in the air; carbon dioxide and the condition of the oceans; photochemical smog to global warming. (Is photochemical smog the true new visual media form of post-World War II technological polluted culture?) Already Crutzen had initiated the expansive way of understanding "anthropocene" to be about more than geology. In Crutzen's ini-

tiating definitions it turned into a concept investigating the radical transformations in the living conditions of the planet.

The anthropocene can be said to be—in the way the German media philosopher Erich Hörl suggests referring to Deleuze—a concept that maps the scope of a transdisciplinary problem. So what is the problem? Hörl's suggestion is important.² He elaborates the anthropocene as a concept that responds to specific questions posed by the technological situation. It is about the environmental aspects but completely tied to the technological: this concept as well as its object are enfolded by technological conditions into which we should be able to develop a further elaborated insight with the tools and conceptual arsenal of the humanities. Indeed, this is where a geology of media can offer necessary support as a conceptual bridge between chemical and metallic materials and the political economy and cultural impact of media technologies as part of the discourses of the ongoing global digital economy.

The concept of anthropocene becomes radically environmental. It does not mean purely a reference to "nature" but an environmentality understood and defined by the "technological condition."³ The environmental expands from a focus on the natural ecology to an entanglement with technological questions, notions of subjectivity and agency (as a critique of the human-centered worldview) and a critique of such accounts of rationality that are unable to talk about nonhumans as constitutive of social relations. The anthropocene is a way to demonstrate that geology does not refer exclusively to the ground under our feet. It is constitutive of social and technological relations as well as environmental and ecological realities. Geology is deterritorialized in the concrete ways in which metal and minerals become mobile, and enable technological mobility: Benjamin Bratton's

words could not be any more apt when he writes of how we carry small pieces of Africa in our pockets, referring to the role of, say, coltan in digital media technologies.⁴ Also apt is when visual artist Paglen sees the geo-orbital layers of satellite debris as outer reaches of earth's geology and the anthropocene (The Last Pictures project).

iPhones are, in the words of *mammolith*, an architectural research and design platform, "geological extracts" drawing across the globe earth resources and supported by a multiplicity of infrastructures. The bits of earth you carry around are not restricted to small samples of Africa but include material from the Red Dog pit mine in Alaska (zinc ores) which are then refined into indium in Trail, Canada. But that's only small part of it, and such sites, where material gradually becomes media, are "scattered across the globe in the aforementioned countries, as well as South Korea, Belgium, Russia, and Peru."⁵ An analysis of dead media should also take into account this aspect of the earth, and its relation to global logistics and production.

More concretely, let's focus for a while on China—but China understood as part of the global chains of production and abandonment of media technologies. This geopolitical China is not solely about the international politics of trade and labor (which are not to be neglected either). In a sense, we can focus on the material production of what then ends up as the massive set of consumer gadgets, and the future fossil record for a robot media archaeologist, but also as discarded waste: both electronic waste and scrap metals, necessary for booming urban building projects and industrial growth. So much of this is driven by the entrepreneurial attitude of optimism: of seeing the world in terms of material and immaterial malleability, which in the case of media technologies has been recently realized also to include hardware in new ways. Indeed, in the midst of the wider enthusiasm for

a global digital economy of software, some business correspondents such as Jay Goldberg have realized that hardware is dirt cheap and even "dead."⁶ 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,"⁷ than it is an acknowledgment of a business opportunity.

Goldberg's dead media business sense is focusing on the world of super-cheap tablet computers he first encounters in China and then in the U.S. for \$40. In 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 a business cards or Chanukah gifts.⁸

The reduced price of the tablets means widespread availability even for specified niche uses: from waitresses to mechanics, elderly people to kids, tablets could become the necessary accessory in visions that blow one away when one realizes the business prospects. The Goldberg's visceral reaction 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.⁹

Even hardware gets drawn into the discourse of experience economy with its connotations of immateriality. Hardware softens, becomes immaterialized, and its materiality seems to change before our eyes. What Goldberg misses is that hardware does *not* die, not even in the Sterling sense of unused dead media that becomes a sedimented layer of fossils left for quirky media archaeologists to excavate. Instead, it is abandoned, forgotten, stashed away, and yet retains a toxic materiality that surpasses the usual time scale we are used to in media studies. Such abandoned media devices are less about the time of use, or practices of users, but the time and practices of disuse. It would be interesting to write a history of cultural techniques of technological disuse. The chemical duration of metal materiality is also an important concept here. 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 devices that are a risk to scrap workers as well as to nature, for instance, to the soil.

Next, look at the case from a different perspective. Adam Minter's journalistic report *Junkyard Planet* offers a different story of hard metals and work, and looks at the issue from the geology of scrap metals.¹⁰ China is one of the key destinations, not only for electronic waste but scrap metals in general; this offers a different insight into the circulation of what we could call the geology of technologies. China's demand for materials

