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Tree to Telegraph: Natural Entanglements in the Information Age

In the mid nineteenth century, the founding of the information age was deeply contingent upon the dark red blood of a particular species of rainforest tree native to Southeast Asia - the *Palaquium Gutta*. The natural latex of this and a few members of the *Sapotaceae* family, marketed in Europe as gutta-percha, had been used by indigenous forest tribes for centuries to fashion durable tool handles or water vessels. (Godfrey 18) Historian John Tulley relates that once its utility was learned in Europe it became nearly a household name in the late nineteenth century, being used to produce decorative and everyday objects of all kinds, from picture frames and walking sticks to golf balls and dental fillings. (564) Having properties similar to modern plastics, European engineers soon discovered that it was the perfect insulator for submarine cables in the nascent telegraph industry. An international telecommunications boom would follow when refined gutta-percha insulation made it possible to successfully connect Ireland to Newfoundland in 1859 with an undersea cable hundreds of miles long. (Tulley 568) The revolution in instantaneous communication would be indispensable for industries and empires, and lay the blueprint for the submarine communications which constitute the modern internet. (Winston 321)

The explosion in demand for gutta-percha would not end well for the trees from which it was harvested. The tree resisted the traditional plantation model due to slow growth rate and difficulties in cultivation. (Godfrey 85) Colonial exporters instead preferred to rely on the indigenous knowledge of forest tribes who foraged in the wild with blunt extraction that required felling the entire tree for a few ounces of sap. (Tulley 571) Within thirty years the trees would be ruthlessly culled to near extinction in their native habitats from the Malay peninsula, Singapore,

Indonesia and Sumatra. It is estimated that millions of trees were lost due to market demands from European telegraph cable producers. (Tulley 575)

The scale of this environmental crisis and its deep entanglement with the dawn of the information age has important resonance for the contemporary climate catastrophe, where technology, capital and anthropocentric hubris has brought the entire world to the brink of existential crisis. To examine the thoughtlessness which precipitated this “Victorian ecological disaster” (Tulley) they essay will explore the construction of the idea of a “natural” world as separate from human societies and contrast this to indigenous animistic cosmologies which maintain equanimity in relation to the non-human, complicated by their willful complicity in the exploitation of trees in Southeast Asian forests. Along with a historical dissociation of the human from the non-human, it is also the persistence of short term thinking which privileges the material goals of a privileged few, vis-a-vis global capitalism, which continue to hinder the ability of humans to effectively respond to cascading ecological collapse.

The *Isonondra Gutta* of Malaysia had an impressive presence, with great buttress roots supporting a tree between sixty and eighty feet in height. Trunk diameters of up to five feet were recorded for older trees, which grew clustered together in the upper rainforest elevations away from the coast. (Tulley 567) The inland trek through the jungle would be undertaken by a few individuals or small bands who would forage for several weeks on end armed with the specialized indigenous knowledge of the forest dweller. (Godfrey 162) The diverse indigenous tribes in Malaysia are now collectively referred to as Orang Asli, or “original people”, while in Sarawak the most prolific gutta-percha collectors were the Iban hill tribes (Godfrey 138). When a suitable tree was identified, it would be felled to the forest floor, and branches sheared to prevent the latex from being drawn into the leaves. Ringed incisions would be cut into the bark at even intervals where the latex would be found in narrow veins running through the heartwood. The latex would be drained into small vessels of coconut shell or bamboo until the sap coagulated beyond further retrieval. (Tulley 571) The sap was later refined by boiling, and was pliable when warm such that it could be worked into any shape. Aside from crafting utilitarian tools there are also reports of Sarawak peoples in Borneo shaping small animal figurines, such as

alligators, that were meant to give thanks for their success. (Godfrey 62) Anthropologist Frederick Dunn has characterized the various tribes of Malaysia as “specialists forest collectors who have evolved to fill a niche created by the overseas demand for Malayan forest products.” (Rambo 139) This subsistence trading lifestyle has been identified in other tribal groups throughout Indonesia and Borneo who have participated in Southeast Asian maritime trade networks for up to five millenia prior to European colonial efforts. (Rambo 140) When English colonial powers in Singapore undertook to export large quantities of gutta-percha to the metropol, rather than attempting colonial plantations as in other industries, they relied on a pre-existing network of Chinese and Malayan merchants who traded by river and sea ports with the inland indigenous forest dwellers. (Godfrey 147)

Thus it took a system of globalized trade across vastly different cultures to get tree material from the inland rainforests of Southeast Asia to the ship docks of London where it would be transformed into the wonder material of the nineteenth century by engineering luminaries such as Michael Faraday or Werner Von Siemens, co-founder of the modern SIEMENS. The latex was unique in that, unlike other natural rubbers, it had all the properties of synthetic plastics – strong, flexible, non-conductive and non-corrosive. In short, it was perfect for electronics. (Tulley 567) It was to prove to be a silver bullet in solving the signal problems that had plagued early underwater communications efforts in telegraphy. By the early 1860s telegraph cables using gutta-percha were a literal extension of colonial power, criss-crossing England and continental Europe to Africa and the Indian subcontinent. (Tulley 563) Over the next two decades dozens of ambitious undersea connections would be laid across the Atlantic, Pacific, Mediterranean and Indian oceans forming communications networks which became the nervous system of industry and empire. (Tulley 568) Given the indispensability of gutta-percha at this time there is deep irony that the most cutting edge technological feat of that century, essentially the creation of the first internet, would not have been possible without a vast force of indigenous foresters powered by traditional oral knowledge. It is equally astounding to imagine that by the turn of the 20th century the industry had become nearly obsolete, and that today some 27 million trees worth of natural latex sits discarded at the bottom of the ocean floor.

Examples abound of human predation on natural resources and ecosystems in the name of progress. Eula Biss reminds us of the millions of North American trees cut to be fashioned into telephone utility poles, claiming that “by the turn of the century, there were more telephones than bathtubs in America.” (85) And yet the obstacle of short term thinking in the story of gutta-percha seems to uncannily foreshadow the ever worsening ecological predicament of the present climate catastrophe. There was great euphoria at the completion of the first transatlantic cable, not dissimilar from the public spectacle of the lunar landings of the 1960s. (Tulley 570) The trees on which it relied appeared wholly absent from the public imagination, and indeed the number of trees involved is difficult to imagine. It is estimated that the inaugural transatlantic cable of 1859 weighed 2,000 tons, 250 tons of which was gutta-percha insulation. (Tulley 575) But the collection methods of indigenous tribesmen were never intended to scale up to this sort of demand. The felling of an entire tree would yield on average a mere 10-12 ounces of resin, which would lose more weight when it was boiled and refined. The 250 tons of gutta-percha consumed to be able to send news headlines from London to Boston would demand the loss of roughly 900,000 trees. Tulley draws on the writings of the Victorian botanist James Collins who reported that the *Isonandra* tree had become practically extinct on the island of Singapore as a result of gutta-percha exports to Europe over a 15 year period, which had begun in 1844. (572) Collins also estimated that in a single part of the Malaysian forest province of Sarawak some three million gutta-percha trees were destroyed between 1854 and 1875. According to Tulley’s sources, gutta-percha bearing trees were nearly extinct from most of their native habitats by the 1890s. (572) Nineteenth century botanists and engineers warned of the dangers of overharvesting and collapse in supply chain, yet in Tulley’s words “Inertia, myopia, expediency, and greed prevailed” (577) Industries, governments and a nascent news reading public had become so dependent on the power of new communication technology that it became impossible to break the momentum of consumption, even when resource depletion was in sight.

Similarly the euphoria of technological progress amidst the “great acceleration” of the 20th century has encouraged a blindness to the natural resources being depleted at unsustainable rates, including the burning of fossil fuels, all of which have contributed to the onset of dangerous global warming. (IPCC 4) The facts of anthropogenic climate change are clear and

well documented and scientists have been vocal and specific in their prescriptions to avert climate catastrophe, yet in the thirty years since the first IPCC report there has been only a sluggish response to implementing the systemic reforms needed to slow the process, and humans seem to be woefully unprepared for the imminent “intrusion of Gaia” (Stengers 43) in the affairs of human civilization in the form of global climate catastrophes. Observational data in the natural record due to anthropogenic changes to the Earth system were pronounced enough by the early 2000’s to prompt climate scientist Paul Crutzen to declare the Holocene inadequate for classifying the scientific data of climate change. (Angus 28) Thus was born the proposal for the Anthropocene Era, the profound consequences of which has since expanded far outside its primary area of application in the climate sciences. Now in the midst of the “great dithering” (Haraway 102) numerous publications, essays, and self-help books weighing in on the anthropocene have nearly normalized the crisis as mundane. Bruno Latour claims that we cannot even use the word “crisis” anymore because a crisis implies something might be addressed or resolved. (7) The anthropocene is an ongoing irreversible transformation from which we cannot escape. (Latour 8)

The story of the *Palaquium Gutta*’s contribution to the telegraph, specifically the deep entanglements between the natural, human and technological, could participate in what Donna Haraway would call “string figures” (10), useful objects of analysis that help “to understand how particular human communities, as well as those of other living beings, are entangled, and how these entanglements are implicated in ... their accompanying patterns of amplified death” (Van Dooren 60). In this light it is worth attempting to pull apart these three strands in order to better understand their construction, and how they also resist disentanglement.

To start, technology at once appears easily identifiable, and easy to condemn, especially when defined as the instrumentalization of natural resources, e.g. tree becomes telephone pole; or lithium salt becomes car battery. Yet to demonize technology assigns it false agency in a way that absolves human actors. To take a relevant example, it is largely because of the advancement of technological tools, such as satellite communications, remote sensing or large data modeling, that climate science is able to build definitive consensus on the factuality of anthropogenic change.

Technology works at the agency of human actors, and so perhaps a more useful view of technology comes from the Heideggerian analysis which defines technology as a system of ordering and enumerating which aids in the “ordering up” of all things, the creation of “standing reserves” of all resources, including humans. (Heidegger 16) That technology enables the system for the capitalization of resources is an essentially Marxist position which ecologists tend to agree with, such as when Haraway claims “Coal and the steam engine did not determine the story... one has to at least include the great market and commodity reworldings of the long sixteenth and seventeenth centuries”. (48) Thus it is not the technological object which is at fault but the way technology is used to reproduce the structures of power and demands of globalized capital. It is thus a systemic capitalist hegemony enabled by advanced technology that has created the malaise of myopic thinking that positions the priorities of a few privileged humans above other living things such that “it is easier to imagine the end of the world than the end of capitalism.” (Jameson, 76)

The era of the telegraph is the culmination of both the “long sixteenth and seventeenth centuries” and the subsequent Age Of Enlightenment with all its “systems of ordering” at the hands of those such as Newton, Descarte or Locke. The emergence of the modern western sciences would give primacy of thought to empiricism, quantification and reductiveness that would inform technology and culture for centuries. (Latour 77) The natural sciences, led by figures such as Hans Sloane or Carl Linnaeus, began a project of knowledge building based on the rigorous itemizing of all the known natural world, creating catalogs and taxonomies for every living thing and producing the first great “natural histories”. This rigorous compartmentalization thus engenders the modern formulation of “nature” as being an ontologically separate entity from human civilization, and therefore humans. (Latour 76)

With this historical context it becomes more clear how nature as a *human* formulation that only makes sense as an othering made by humans against non-humans. When taxonomies are incomplete, humans resort to the invocation of “wilderness” to describe any part of the Earth that is unknown, unquantified or unpossessed by the human. In the words of Gillian Rudd “its very unknowability defines it and, significantly, the wilderness resists the entry of humans.” (91)

The idea of wilderness as a “non-place”, uninhabited or unmodified by humans, however, is dismantled by Phillipe Descola in his wide ranging anthropological survey which shows that the great “*terra nullius*” of the nineteenth century, from the Amazonian jungle, the vast North American continent and the rainforests of Southeast Asia, were not untouched places at all, for they had been inhabited and subtly conditioned by indigenous peoples who had dwelt in these ecosystems for millennia. (Descola 33) Moreover the cosmologies of the indigenous do not at all reproduce the nature vs. human binary of the modern West, but positions the human in egalitarian fashion to all other plants, animals and non-humans with which they share resources and relations. A common feature of indigenous relations seen throughout Descola’s research is a plurality of subjectivities across living organisms of all faculties, an understanding which the “moderns” have only recently attempted to recover. (Descola 398)

With the human/non-human distinction cast in doubt, Bruno Latour has proposed that the “human” and “natural” worlds are two sides of the one mutual relationality, insisting that one cannot be defined in the absence of the other. They are marked subcategories of one unifying structure which he calls “nature/culture”. While Latour and Descola both challenge the de-animation of nature for the sake of human exceptionalism, Latour maintains that nature/culture is an all encompassing structure that one cannot “go beyond”, despite that being the title of Descola’s anthropological opus (Latour 13). Haraway also shares Latour’s view of the inextricable relations of the human and nonhuman, and finds support for this “multispecies worlding” in the biosciences, citing numerous examples in which human, plants, bacterias and other “critters” have profoundly complex, co-supportive relations. Throughout her ecocritical writings she complicates and teases apart their myriad entanglements so as to decenter the human and flatten hierarchical models. To achieve a multispecies awareness we must acknowledge that “we require each other in unexpected collaborations and combinations, in hot compost piles. We become-with each other or not at all.” (Haraway 4) Synthesizing a variety of thinkers reveals that what has historically been constructed as separate threads of the natural and the human now appear to be one braid. But what of the loose end, technology? In a characteristic aphorism from R.W. Emerson, “Nature, who made the mason, made the house”. (302) Technology is a product of humans, which are a part of nature, which makes for one immense, messy tapestry.

To return to the fate of the gutta-percha trees at the dawn of the techno-information age, we can now consider this crisis in terms of not just “myopia” or “expediency” but one in which humans are to an extent so artificially disassociated and compartmentalized from other living beings that they can no longer recognize any shared subjectivities. The lives of non-humans, in this case trees, are rendered inconsequential in the face of instrumentalization for material gain. The centers of imperial and colonial power were far removed, geographically and culturally, from the biomes in which they enact destruction. The webs of capitalist demand also entangled and corrupted the indigenous humans who inhabit the forests, who then unwittingly reproduced the thoughtless exhaustion of other living things who were so unlucky as to be found useful to humans.

To project beyond our fraught present, it may be helpful to consider the events which immediately followed the gutta-percha crisis due to unsustainable overharvesting. As the scarcity in supply of the tree resource led to ballooning costs and financial havoc in the telegraph industry in the mid 1890s, the technology itself was also about to be rendered obsolete by the development of radio communication. (Tulley 578) By the early twentieth century telegraphy had all but been superseded by radio and then satellite communication. (Winston 69) As to the unique material properties of gutta-percha, these would be mostly replicated by synthetic plastics by the 1930s. The fifty years of usability of submarine telegraphy was shorter than the average lifespan of a single *Isonandra Gutta*.

Proponents of techno-accelerationism will actually claim a victory here – the crisis of gutta-percha was resolved (or made irrelevant) by the further advancement of technology! Therefore the solution to our current environmental debacle is also *more* technology. Castro and Danowski, in *Ends Of The World*, are alarmed by entrepreneurial think tanks such as The Breakthrough Institute in California who contend that “the solution for global warming resides not in the restriction but the liberation of economic activity and technological development. Instead of scaling down, we need to scale up even more.” (49) In this tech-utopic anthropocene, where humans have geo-engineered their way around climate change, there is no environmental

system that is external or in antagonism to humans. “Old Nature will be recodified (or rather re-axiomatized) by the capitalist machine” such that ecological disaster just needs better ecological management, “everything according to so-called ‘best practice.’” (Castro & Danowski 49)

In the early 20th century, this logic of rapid acceleration worked out well for humans – not so well for the trees. The decimation of the *Isonodra* and *Pallaqium Gutta* in their millions was only a foretaste of the complete deforestation that would follow in much of the Southeast Asian rainforests in the last one hundred years. (Tulley 578) Recent reports estimate that over 50% of tree cover has been cleared in many of the same biomes of the gutta-percha tree since the industrial era, with local figures as high as 90% in some parts of Indonesia and the Philippines. (Hughes 2) Industrialization and globalization have been in lockstep with ever more aggressive environmental losses. If we attempt to solve the global environmental crisis of the Great Acceleration with *more* acceleration, we can certainly anticipate the continued disappearance of more natural habitats and non-human life, consistent with what is being called the sixth major extinction event. (Haraway 43)

To reduce the debate to a conflict between techno-solutionism and eco-socialism, however, would still be to lose sight of the concern for the living beings that know nothing of mobile phones or poll booths. It might be instructive to ask: which ‘crisis’ are we trying to solve for? Is it the threat to industry, commerce and the perks of modernity by the depletion of key natural resources? Or is it the specter of species extinction, biodiversity loss and irreversible changes to the Earth climate system? Simply put, should humans be privileging the concerns of the human or the nonhuman?

If we are to turn again to Latour’s position that nature and culture are only defined in terms of the other, we can conclude that it is not an either/or decision. The destruction of the natural is also the destruction of the human. The habitability of the Earth as a life supporting system is only possible because of complex feedback loops between geochemistry and biological organisms – not a mechanical accumulation of elements but “a system in which the organisms

are an integral part.” (Lovelock 127) This was considered radical when first proposed by Lovelock and Margulis in *The Gaia Hypothesis* as it upended the reductive compartmentalization which had previously characterized the natural sciences. It is due to plant life alone that Earth’s atmosphere became oxygenated approximately 2.4 bn years ago in the early Proterozoic by the first oxygen producing chlorophyll in which “both geological and biological causes seem to have come together to change the face of the planet definitively” (Coccia 36) Animals and plants are immersed in a shared oxygenated atmosphere which, for Emanuele Coccia, gives rise to a fluid space and reciprocity in every interaction, such that “in all space of immersion, to act and to be acted upon are formally indistinguishable”. (37) Human societies have always been co-productive and entangled with every other creature in a fluid space of reciprocity, for good or ill.

Humans need to support and regenerate the nonhuman living world in order to make the whole world habitable for all. A glance back to the dawn of the information age over a century ago is an instructive study of the precarity of human societies which are dependent on fragile natural resources. To have largely forgotten the catastrophe of the *Palaquium Gutta* is a repetition of the short term thinking that has been at play with every successive degradation of the Earth system, up to the unfolding climate crisis. Moreover, to be able to see a mere one hundred years' distance is insufficient. The Earth system works in cycles on the order of tens of thousands to millions of years. Humans need to begin to think and plan in terms of centuries and millennia to even begin to adequately address the systemic problems of the current regime of global capital careening towards ecological collapse. The future of all human and non-human life depends on it.

Works Cited

- Angus, I. (2016). *Facing the anthropocene: Fossil capitalism and the crisis of the earth system*. Monthly Review Press.
- Biss, E. (2008). Time and Distance Overcome. *The Iowa Review*, 38.1, 83–89.
- Castro, E. V. de, & Danowski, D. (2016). *The Ends of the World* (R. G. Nunes, Trans.; 1st edition). Polity.
- Coccia, E. (2018). *The Life of Plants: A Metaphysics of Mixture*. Polity.
- Descola, P. (2014). *Beyond nature and culture* (J. Lloyd, Trans.; Paperback edition). The University of Chicago Press. <https://doi.org/10.7208/chicago/9780226145006.001.0001>
- Dooren, T. van. (2014). *Flight Ways: Life and Loss at the Edge of Extinction* (p. 208 Pages). Columbia University Press.
- Emerson, R. W. (1984). *Emerson's essays* (Repr). Dent.
- Godfrey, H. L. (2018). *Submarine telegraphy and the hunt for gutta percha: Challenge and opportunity in a global trade*. Brill.
- Haraway, D. J. (2016). *Staying with the trouble: Making kin in the Chthulucene*. Duke University Press.
- Heidegger, M. (1977). *The question concerning technology, and other essays*. Garland Pub.
- Hughes, A. C. (2017). Understanding the drivers of Southeast Asian biodiversity loss. *Ecosphere*, 8(1), e01624. <https://doi.org/10.1002/ecs2.1624>
- IPCC, 2023: *Summary for Policymakers*. In: *Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, H. Lee and J.

Romero (eds.)). IPCC, Geneva, Switzerland, pp. 1-34, doi:
10.59327/IPCC/AR6-9789291691647.001. (n.d.).

Jameson, F. (2003). Future City. *New Left Review*, 21, 65–79.

John Tully. (2009). A Victorian Ecological Disaster: Imperialism, the Telegraph, and Gutta-Percha. *Journal of World History*, 20(4), 559–579.
<https://doi.org/10.1353/jwh.0.0088>

Latour, B. (2017). *Facing Gaia: Eight lectures on the new climatic regime* (C. Porter, Trans.). Polity Press.

Lovelock, J. (1991). *Gaia: The Practical Science of Planetary Medicine*. Gaia Books.

Rambo, A. T. (1981). *Review of Rain-Forest Collectors and Traders: A Study of Resource Utilization in Modern and Ancient Malaya. Monographs of the Malaysian Branch, Royal Asiatic Society, No. 5*, by F. L. Dunn. *Asian Perspectives*, 24(1), 139–141.

Rudd, G. (2007). *Greenery: Ecocritical readings of late medieval English literature* (J. J. Anderson & G. Ashton, Eds.). Manchester University Press.
<https://www.jstor.org/stable/j.ctt155j7xr>

Stengers, I. (2015). *In catastrophic times: Resisting the coming barbarism* (A. Goffey, Trans.). Open Humanities Press.

Winston, B. (1998). *Media technology and society: A history: from the telegraph to the Internet*. Routledge.