

Oceans as the Paradigm of History

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Abstract

The temporality of historical flows can be understood through the paradigm of oceanic circulations of water. Historical processes are not linear and tunneled but circulatory and global, like oceanic currents. The argument of distributed agency deriving from the ‘ontological turn’ dovetails with the oceanic paradigm of circulatory histories. The latter allows us to grasp modes of both natural and historical intertemporal communication through the medium of the natural and built environment. Yet the inclination in these new studies to deny any particular privilege to human will or design risks neglecting the changing role of human agency. Analytically I distinguish *historiographical time* from *historical time*. Historiographical time may be seen as the purposive capture of historical processes for various goals whereas historical time is more continuous with natural flows. More than origins and causes, the paradigm emphasizes the ramifying consequences of purposive actions. The gap in our understanding of the two temporalities has had a devastating impact on the planet.

Keywords

Anthropocene, historical time, historiographical time, oceans, paradigm

Introduction

The field of pre-history is said to be characterized by the absence of a writing system and that of history proper to be the study of human activity over the last 5000 years or so based on texts and artefacts. More recently, non-artefactual recording processes, such as carbon dating, tree rings, dental and skeletal remains, have begun to be used in historical studies. The 21st century is beginning to see a vastly expanded notion of the human past where human agency is so entangled with every kind of organic and non-organic material as to potentially challenge notions of history inherited from the 19th and 20th centuries (McNeill, 2016). Joining this challenge, I explore a wider conception of historical *time* assimilated with natural temporalities through a meta-historical paradigm of oceanic circulations of water. At the same time,

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I probe the *changing* role of human historical agency in this vastly amplified scope of history.

Historical processes are not fundamentally tunneled, channeled or directed by national, civilizational or even societal boundaries but are circulatory and global, much like oceanic currents. The argument of distributed agency – the entanglement of the human and non-human – deriving from the ‘ontological turn’, the new materialism and actor-network theory dovetails with an oceanic model of circulatory histories. The latter allows us to observe modes of inter-temporal communication through the natural and built environment that can be used to grasp the medium of historical interaction. Yet the inclination in these new studies to deny any particular privilege to human will or design often causes the specific status or role of the human to be neglected or dismissed.

In a pioneering work, Timothy LeCain has argued that the effort to nominate a period as the Anthropocene is a blunder because, from his neo-materialist perspective, both the optimistic and pessimistic camps of this anthropocentric theory ‘depend on the idea that it is precisely this separation (*between humans and non-humans*) that gives humans their extraordinary power over the natural world’ that they decidedly do not have (LeCain, 2017: 315, 319). While that may well be so, I argue that the disenchanting historiographical perspective from the European Enlightenment is vital to identifying the role of human agency in shaping the planet and threatening its destruction; it remains to be seen whether this heroic vision is also capable of rescuing it.

The paper begins with the rationale of circulatory history and proceeds to explore parallels between oceanic flows and historical time. The oceanic metaphor enables us to see the ramifying consequences of purposive activities at different temporal and spatial scales. The second part seeks to locate human initiated projects in the continuum of natural historical processes including the material media of inter-temporal communication. Human inscriptional records are a small, if critical, part of the media of natural recording and communication used by organisms, terrestrial and oceanic, and the media of the natural and built environment shape human activity just as we act upon them.

I subsequently argue that oceanic flows may be viewed as a paradigm to illumine the temporal processes of human and other natural activities. Thomas Kuhn argues that metaphors can also involve certain substantive relations between two referents. The basic laws of physics and the science of flow designs and patterns reveal the ontological links between ocean-atmospheric and historical movements. Following this discussion of material continuity, I transition from the paradigmatic understanding of the ocean to the historical relationship between humans and the oceans. Pre-modern cosmologies had an experiential understanding of human-nature relationships, although they may not have recognized

the centrality of oceanic forces. Coastal, island and waterborne communities certainly adapted their activities and cultures to the patterns of the oceans. The Enlightenment ideal of the mastery over nature disrupted this more adaptive approach to nature and particularly the oceans. I track the history of this disruption ultimately as a destructive contest between the historiographical mode and the historical force of the ocean.

Circulatory Histories and Oceanic Flows

What I call ‘circulatory history’ in my recent work is interested principally in the flow of time (Duara, 2015). Circulatory, in my usage, does not necessarily reference a return to a starting point, but a movement or distribution from place to place. Historians have engaged various conceptions of time, including national and civilizational histories which engage evolution with a telos of progress. The phenomenological conception is one whereby different societies experience time differently and advocates of Big History (Christian, 2005) conceive historical time as embedded in processes of evolutionary complexity. This essay draws significantly from ideas of evolutionary complexity and process philosophy (Kauffman, 2008; Whitehead, 1985).

What media – bodies, vehicles and agencies – best allow us to recognize and register the flow of time? The first candidate would be sunlight with its diurnal and seasonal cycles. But the flow of light is so rhythmic that it is hard to decipher different patterns of time. Another natural candidate is water, which may be more interesting for historical time because it is tangible, and although water is a re-cycling element, as Heraclitus famously declared, one cannot step twice into the same river.

My quest for an alternative paradigm to grasp the flow of historical time can be traced to my earlier work (Duara, 1995) and stimulated by recent work on circulatory and connected histories as a deeply interconnected historical sphere populated by sprawling networks, expanding and contracting empires, traveling ideas and practices, circulating microbes and species of all kinds. I seek to dislodge historical writing from serving as the instrument of the nation’s sovereign legitimacy. The rationale for this is both simple and deep: the nation-form has been the dominant mode of identity for most of the world over the last couple of centuries and it is structured to engage in a competitive capitalist race for global resource domination; in turn, it has led most visibly to two world wars and to the ravaging of the global environment since we entered the Anthropocene.

The forces for global cooperation and checks against predatory activities upon people and nature have been much weaker, in great part because of the nationalist imperative for GDP growth and the constellation of interests legitimated by this imperative. National histories are the principal means of establishing the imagined solidarity and destiny of

the nation. I try to show here that history is by no means linear and tunneled, predestined to tell the story of the nation. The oceanic paradigm attends less to 'origins' or causes of processes than to their ramifying *con-sequences*. It allows us to grasp how historical 'ownership' of science, technology, culture, civilization – the question of sovereignty itself – cannot be sustained when we recognize that human history shares significantly with other societal and natural processes as a collective planetary heritage. Addressing consequences is imperative if we are to address the problems of planetary sustainability.

Of course, there are subjects in history that seek to control or shape processes, but beyond a point the process escapes these subjects. Heuristically, I distinguish between *historical* time and *historiographical* time, which includes purposive reflexivity. While there has always been purposive activity conceived and projected over time, historiographical time comes into its own with the advent of modern, disenchanting and causal historical thinking. We might say that historiographical time is ontologically conditioned by historical time, but also that historical time is grasped when historiographical time reflects on its own condition of possibility. Practically, the contemporary historian might seek to bridge this gap by exploring the unprojected and longer range effects of human activities.

To be sure, the two are practically difficult to distinguish because this reflexivity also shapes the process. Nonetheless, the process exceeds the determinate purpose of the human initiator as it merges in the circulatory flow of historical time. Historical 'events' flow on, shaping and being shaped, bearing, to paraphrase the process philosopher A.N. Whitehead, the 'many' from the 'disjunctive universe' which it gathers and increases by one (Whitehead, 1985: 21). And in its carrying there are also memories and brandings that are cognized by some and recognized by others as a return, as well as counter-currents and counter-finalities. The analytical differentiation between the two temporalities allows us to see how and why they were so separated and how and why they may converge.

Historical time is not fundamentally different from the flow of time in natural processes which too remains irreversible. The temporal medium in which reversible processes occur is *absolute time*; it depends on nothing external and moves in a linear way (Slif, 1993: 273–4). The flow of historical time is expressed in routine repetitive acts (never exactly identical) as well as the gathering or morphing into events caused by global interactions and contingencies, human and natural. The model of natural processes most useful to understand history is the circulatory flow of oceanic *water*. Unlike rivers, they are not tunneled and bounded; their channeling is more interactive, inter-scalar and voluminous.

Ocean currents develop in interaction with changing atmospheric conditions of pressure, heat and wind, geological features and tidal activity.

The Coriolis Effect, the trade winds, the Gulf Stream, equatorial currents and counter-currents, El Niño–Southern Oscillation, the Indian Ocean Dipole, monsoons, cyclones, tsunamis, upwellings and thermohaline mixings are some of the well-recognized oceanic-atmospheric processes. Oceans reveal circulatory currents that are of different temporalities, layers and effects as they go through diverse conditions. Surface currents are faster moving because they carry heat and are shaped by winds; eddies are still faster and more temporary gyres churn up smaller spaces. Oceans and seas are realms where spaces and temporal processes interact at varying scales.

The Mediterranean Sea is a good example since it is a well-studied water-body which is relatively enclosed and serves as a microcosm of an ocean. Like the ocean, it has surface, intermediate and deep-water masses, the circulatory patterns of which are relatively autonomous but also influence each other and the North Atlantic circulation regime. The geography of islands and their shelves affect the circulation of these waters significantly. The inflowing Atlantic waters are directed southwards by the Sardinian and Tunisian shelves whereas decaying eddies in the north are constrained to flow northwards off Western Corsica (El-Geziry and Bryden, 2010: 39–44). Between the surface waters and the deep water, the Levantine Intermediate Water plays an important role in the formation of all deep Mediterranean waters, but its vortices also spread warmer, saltier waters into larger Mediterranean basins (Shultz, 2015).

Deep currents in the ocean are heavier because water becomes colder at the poles and is pulled down by salinity and gravity. But deep currents also flow across the various oceans and cycle through roughly once every thousand years. Over the last several decades, this deep-water flow across the oceans has been understood as a ‘conveyor belt’ reflecting the relatively stable pathway through which the warm waters pushed to the poles, overturned and made its way across the oceanic world. Recently, scientists have ‘deconstructed’ the model of the conveyor belt, suggesting that while overturning and coursing remain true, the conveyor belt idea was too simple. Rather several different pathways have appeared, formed interactively by surface eddies and wind-fields (Lozier, 2010).

This suggests that while its temporality – the rate of flow and the types of activity it produces – has been maintained and the idea of the conveyor belt remains, it is also interactive with other geo-atmospheric forces. Even the deepest level is affected and affects the rest. The impact of anthropogenic activity on the conveyor belt has alarmed the scientific community in recent decades. The massive polar ice melt has increasingly begun to lighten and warm the polar water with excessive fresh water and thus slow (or even halt) the flow of the conveyor belt carrying tropical waters to the north. One major consequence of this is the generation of colder weather in North America and Europe.

Compare currents to historical processes – ideas, practices and material – that flow through time and space. Take the case of an ideational complex circulating across continents over the last 200 years. In 1833, Raja Ram Mohun Roy, a polyglot, thinker and reformer, deist and Unitarian, who is often called the ‘father of modern India’, was visiting Bristol, UK. In American Salem at the time, Unitarians were circulating a locket with a curl of his hair in preparation for his visit, which, however, never happened because he died in Bristol that year. New England Transcendentalists, particularly Henry David Thoreau and Ralph Waldo Emerson, read Roy’s translations of the *Upanishads* and the principal *Vedas*, texts they deeply admired and cited profusely.

American Transcendentalists influenced a wide range of global ideas and practices including abolitionism, proto-environmentalism and civil disobedience founded upon transcendentalist conceptions of self-cultivation of the powers of the mind and consciousness of ultimate reality. Thoreau’s *Civil Disobedience* (1849) influenced many people, including Tolstoy, who in turn was an important influence on Mahatma Gandhi. In the 1890s in South Africa, Gandhi adopted the phrase ‘civil disobedience’ as the English version of his *satyagraha* (truth force) experiment. During Martin Luther King’s Civil Rights movement in the post-war USA, it was Gandhi and not Thoreau who was seen as its patron saint. Although I have traced the circulation of ideas here, let us also note the materiality of the traces, from the circulating locket to the changing technologies of transportation and communication enabling them (Duara, 2015: 53).

We can continue to trace this circulatory current which merges, submerges, re-emerges and converges with various related or emergent processes till the present. Thoreau’s insights were carried forward by spiritual naturalists – John Muir, Aldo Leopold, and Arne Naess – and have crucially shaped American environmental movements. E.F. Schumacher, Gary Snyder, the Deep Ecologists, and feminist ecologists, among others, have been influenced by Asian and indigenous traditions. Many of these ideas around environmental spiritualism and moral protest have cross-fertilized with movements of indigenous people, forest dwellers, civil society and religious groups (including many Gandhian ones) across the world, climaxing (at least for millions of Catholic schoolchildren) with Pope Francis’s radical Encyclical of 2015 on ecology and justice (Duara, 2015; Tucker and Grim, 2016). What was for two centuries a sub-cultural and inconspicuous ‘counter current’ may yet swell into a movement of significance.

Consider the parallels with temporal scales of historical processes through nationalism. Modern nationalism, developing symbiotically (for the most part) and co-constitutively with competitive capitalism, has become the axiomatic principle of legitimacy globally over the last two hundred years. The nation-form built around the *self-other binary* is

the most enduring circulatory feature that has permeated all parts of the world that emerged from empires and other political forms built around more complex forms of belonging. Elsewhere I have discussed the nation/capital formation as the ‘epistemic engine’ that is itself a circulatory form, coursing through the nation-state system, conditioning world views and sustaining a doxic and durable temporality since the 19th century (Duara, 2003, 2021). It is comparable to the deep temporality of the oceanic conveyor belt and its peripheral interactivity with other levels.

The fundamental *raison d’être* for the nation-state is competition, even if competition alone is insufficient to account for nationalism in a particular time and place. At this level, the identitarian polity that is the nation is *mediated* by a host of other forces, such as religion, language, political regime, historical relations, etc., that change and mix; they possess a mid-term temporality in relation to the nation/capital form. Note that competitive capitalism by itself has not always been the most durable formation; consider, for instance, the period of Soviet and Maoist socialism. But I believe Maoism itself needs to be grasped within a world-order of competitive capitalist *states* that ultimately pushed China towards capitalism.

Emergent historical forces or currents shaping societies at this level of mediation possess a kind of *middling temporality* comparable to the mesopelagic level in the ocean. The temporal pattern of this scale often differs from the surface and deeper levels because different conditions can obstruct complete vertical mixing of properties in the water column (Liblik and Lips, 2019). In the terrestrial world I cite, as an example, the *mediatory* form of Chinese nationalism which changed in accordance with the change in China’s place in the international order during the 1980s: from a Maoist socialist state to a globally-participating market society. The socialist model of the civic nation-state built, however rhetorically, upon the fraternity of nationalities within and socialist and Third World internationalism abroad, morphed into an ethnic model privileging the culture of the Han majority. This has also been accompanied by the counter-rise of minority ethnic nationalism in China. Finally, at the most *variable* level, like eddies and gyres, nationalism can function as an ideology, as political strategy, as mobilization politics and as ideals and dreams – e.g. the ‘China dream’ campaign – changing according to contexts and constituencies.

Oceanic Spaces

The flow of water patterns time not only cyclically and sequentially, but also by differentiating spaces and through interactive scales. Geographers have recently developed the notion of ‘wet ontologies’ to challenge the flattening ideas of territoriality by looking to the oceans to open up a

three-dimensional vertical world of volume. The oceans not only challenge the modern state-based territorial conception of power by fluid boundary-crossings of all kinds, but also by posing the problem of reach, instability, resistance, mixing and separation in the voluminous sphere of Earth (Steinberg and Peters, 2015: 251).

Returning to environmental movements, consider the case of the Cambodian forest dwellers in the Prey Lang forests. Protesting the logging and damming of their forests by Chinese and multinational corporations, for years they demonstrated regularly in Phnom Penh's main square using traditional modes of ritual and petitions. In 2011, after the popularity of the Hollywood blockbuster, *Avatar*, they – like several other groups of forest dwellers in Latin America and India – creatively merged their forms of protest with those of the fictional blue-skinned Na'vi who were the victims of corporate greed in the film. This dramatic tactic which is circulatory – for Cambodians who recognize the meaning of *Avatar* as re-incarnation, it is an inflected return – led to an enormous increase of support and mobilization both among Cambodian youth and civil society and among global environmental groups. By re-merging with a circulatory process and propelling it from the local to the global scale, they succeeded in halting much of the environmental depredations, at least over the last ten years.

Similarly, a local environmental NGO-led delegation from Yunnan made a surprise appearance at a UN meeting in Beijing in 2003 which eventuated in the protection of the environment in vast areas of Yunnan by its declaration as the Eastern Himalayan UNESCO heritage site. In 1995 Dai Qing, an environmental activist in China, published *Yangzi Yangzi*, a work registering the environmental, cultural and livelihood damage caused by the construction of the Three Gorges dam. Upon its translation, global NGOs successfully lobbied Western governments and international agencies, including investment banks like Morgan Stanley who had provided significant funding in the first phase of the project, to deny loans to the Chinese government for the second phase of the dam project. Territorial models can hardly capture the scalar fluidity, depth and circular reach of these resistance movements (Duara, 2015: 265–73).

Spatially, like the terrestrial world, the ocean has many zones. Differences in temperature, salinity and undersea and coastal geographies shape the variety of water, organic forms and communities of marine and human life. The northern Indian Ocean, separated in the west by the Arabian Sea and in the northeast by the Bay of Bengal, shows great differences in the two water bodies of levels of salinity, atmospheric humidity and fresh water inflows. In turn, they generate equally great differences in surface water nutrients for marine and human communities, although the factors conditioning the differences continue to be debated by scientists (Prasad, 2004). In the Bay of Bengal, the currents meet in the Indonesian archipelago which marks

the boundary with the Pacific Ocean. But the archipelago, of course, does not completely block the Pacific waters. Warm, low salinity surface waters from the Pacific replenish the evaporating water of the northern Indian Ocean which is carried by the monsoon winds to produce the torrential rains of South and Southeast Asia (NIO, 2018).

The boundaries where waters meet are similar to *ecotones* occupying the productive and heterogeneous transition space between different ecological zones, say between wetlands and rainforests. As discussed later, the monsoons condition human life in these zones, but they have also created spaces of transcontinental interaction. The great Asian coastal maritime trade stretching from the China coast to East Africa (now called the Maritime Silk Road) traceable to the early centuries of the first millennium hewed closely to the monsoon patterns. From the 1400s the routes were held together most importantly at the cosmopolitan port city of Malacca, to which the southwest monsoon winds brought Indian, Persian and Arab traders. There they waited for the northeasterly monsoon winds to carry in the trade from China and eastern regions before returning with the same winds. Until the 19th century, the European traders also followed these patterns, albeit with more militarized vessels (Abu Lughod, 1989).

Rachel Carson's classic work on the ocean notes the variability of these boundary zones. '[W]here two currents meet especially if they differ sharply in temperature and salinity, there are zones of great turbulence and unrest, with waters sinking or rising up from the depths and with shifting eddies and foam lines at the surface.' The 'upwelling' is a source of great richness in marine organisms. There are also spaces of dense salinity and surface stillness. Carson observes that the Sargasso Sea in the mid-Atlantic is a 'place forgotten by the winds, deserted by the strong flow of waters that girdle it as with a river... the only influx is of saline water from the adjacent currents'. Despite the seeming surface stagnation, even here there is the annual addition of weeds from distant coasts 'reproducing vegetatively by a process of fragmentation' (Carson, 1951: 23, 25, 27).

Aquatic *zones* are fluid with no territorial boundaries but currents flowing both within and across them. As such, they resemble the blurred, or perhaps multiplex, edges of historical spaces, *more or less* in accord with the spheres of their activities. By more or less, I mean that many historical societies develop their spheres – e.g. social, linguistic, and economic – more in conformance with physiographic and power constraints on their activities, while others, such as modern or contemporary societies, tend to demarcate their spheres beyond naturally or socially integrated communities – indeed, beyond Durkheim's mechanical solidarity, to imagined and virtual communities.

The historical region is often constructed from the bottom-up through the enlargement of spaces interwoven by historical geographies, such as

East or Southeast Asia. Kapil Raj calls them ‘spaces of circulation’, referring to the circuits which are enabled by pre-existing networks, opportunities and cultures but conditioned by power structures and human barriers (Raj, 2017). The historical regions continue to have dense and accelerated currents of interaction, but the physicality of the region remains fundamental. For example, the Himalayan rivers – upon which well over a billion people in ten countries depend – continue to tie their destiny together, even more with the rapid melting of glaciers and the rage of dam building. At the same time, contemporary globalization connects these regions with many other (including cyber) forces, creating considerable turbulence, both productive and dangerous. The case for understanding history in terms of regions of dense interactions continues to have a natural correlate and emergent consequences.

The Nature of History

What we call history is both process and inter-temporal communication. The latter is often considered to be uniquely human because of recording technologies, including the exclusive prerogative of historical writing and reflection. What can we learn from re-embedding history in the natural process?

In one of the most radical arguments made recently about how materials – plants, animals, minerals, the elements and humans – make history, Timothy LeCain writes that humans and their history ‘actually grow and develop in a vast material environment that creates, sustains, and shapes them’ (LeCain, 2017: 101). Rather than thinking of history as something made by humans, LeCain sees humans as playing a bit part in evolution. As noted, he rejects the designation of our era as the Anthropocene because it is an expression of human hubris that denies the determining role of nature and the material world in the evolution of the planet. He studies the Longhorn cows in Montana and the silkworm in northern Japan, showing how their *co-evolution* with the breeders was necessary for their sustenance and productivity. The construction of modern industrial copper mines in both locations in the late 19th century with their new methods of mining and smelting released great quantities of toxic arsenic into the lands and waters, ultimately destroying the balanced ecologies of the two agrarian activities. Chemical properties are the principal agency active in this story.

As for historical records, we might say that they mimic natural or ‘elemental media’ for registering temporal processes. Natural processes register their activities, whether in geological layers, in tree rings, in DNA (which is a record of a species’ epidemiological history) or not least in memory, language and practices, the record of our social history. Landscapes across the world leave a long history of human activity. Canalized rivers and terraced hillsides are evident instances; less obvious

ones are those where alterations occurred centuries ago. Wetlands have been buried, banks eroded, meandering streams have emerged and vast rivers, such as the Yellow River, have changed course over hundreds of miles, often as a result of human activity. Beings in time, of course, cease to exist; but not without registering their presence or trace – whether for functional purposes or not.

Human reflexivity and the technologies it has generated are said to distinguish historical knowledge from data produced by other organisms. But the sophisticated technologies of scientific observation reveal that biological organisms are constantly registering and responding to environmental changes, faster than ever in the Anthropocene. The Star Moss Cam is a sensor technology that does not merely sense mosses over time but observes how the moss itself is a sensor that is detecting and responding to changes in the environment (Gabrys, 2016: 43–4).

While many organisms may not have reflexive capacities, they certainly have cognition and communication. Just as in the terrestrial earth, the ocean too is a storehouse of records and information for species and interactive organic forms. Cetaceans or marine mammals like dolphins and whales appear to differentiate sounds – phonations in water travel four times faster than in air – possibly identifying who must be responding to whom through the rapidly intensifying din in the ocean (NYT, 2019b). A recent report on whale songs reveals that whales do not communicate only for mating purposes but are constantly transforming and evolving forms of communication across hundreds of kilometers (NYT, 2019a). Some even claim that dolphins have an aquatic public sphere! In the words of John Durham Peters:

Maybe the whole ocean is their [cetaceans'] auditory apparatus and archive; by joining their water-based inner ear with the outer ear of the ocean, *perhaps they have a medium for being in time that resembles our recording media but contrasts with the apparent instantaneity of our oral communication*. What is perhaps natural for them – non-linear data access – is a matter of cultural techniques for us, and is only made by recording media. (Peters, 2015: 96; emphasis added)

Peters, a philosopher of communication, has argued that since the appearance of technological media of distant communication in the 19th century, we have forgotten the idea that media is *primarily* natural. In *Marvelous Clouds*, he argues that air, water, ground, fire, light, and clouds are the elemental media of communication for beings. The properties of water and the capacities of the cetaceans must be thought together; the medium, the message and the communicators constitute the dynamic of communication.

With historical processes, the natural and built environment are the principal medium of communication across time and space. At the same

time as the media provision beings, beings (content makers) ‘read’ and interpret these traces and signs and generate emergences. Historical time is the concatenation of events and activities, emergences and circulations of materials, practices and ideas which leave traces and records in their built and natural environment. Just as this environment can channel and reshape messages, humans also use their technological capabilities to record and reflect upon processes which can re-shape the environmental media.

In this dynamic, some of these message sequences die out, others have *con-sequences* and take on new lives, and still other return whether recognized or not – often as renewal. Historical processes may be indicated and evidenced through tiny traces such as Roy’s circulating lock of hair, itself an adaptation of circulating religious reliquaries. These traces can carry historical forms and ideas across continents and time. With regard to material history, it is now the gargantuan nuclear and hydro-power projects and a million miles of fiber-optic cables on the ocean-bed that generate possibly still more *con-sequences* and counter-finalities that historiography and scientists may or may not be able to capture.

The point of this exercise is to suggest that inter-temporal communication among humans both resembles and is indissolubly linked with other beings, organic and inorganic. The communicator, the message and the medium are interdependently creative, much as the ocean waters are the medium and co-creators of its flows with oceanic beings. At a fundamental level the historical process engaging humans is also natural. Processes generate other processes. Events impact, churn, disperse; parts die and other parts transform, transmute and return.

The Oceanic Paradigm: History and Historiography

Historical processes are heterogeneous networks traceable through artificial (human initiated) and natural elements. Analytically, one may think of these processes along a continuum of dominance by nature and artifice, a continuum shaped by interactive flows. The oceanic flow can be seen as the vital metaphor or paradigm of this continuum.

The discussion of ‘paradigms’ elaborated by Thomas Kuhn in *The Structure of Scientific Revolutions* reveals two uses of the term (Kuhn, 1962). A paradigm in sense (i) represents the assumptions, framework, principles and rules guiding a coherent tradition of investigation. At the same time, Kuhn uses paradigm (ii) to refer to a single work, such as Newton’s *Principia*, as paradigmatic in the sense of exemplifying this wider framework by acting as a common model. Similarly, Foucault’s ‘panopticon’ is paradigmatic of surveillance and governmentality in modern society which he called ‘panopticism’. By revealing its principles and modes, the particular function of the paradigm, as a mode of knowing, lies in making intelligible a wider set of problems which constitute

the paradigm in Kuhn's sense (i) (Agamben, 2002). In other words, it is both a being or object in the world, but also illumines how other beings process time.

In a subsequent essay, Kuhn urges that metaphors are not only ostensive but also constitutive of certain substantive relations between two referents within a network of similarities (Kuhn, 1993). The turn among some historians to Big History reflects some of this substantive connection. Since Big History flagged the significance of evolutionary complexity, historians have turned to basic concepts in science to develop a more natural basis for historical studies. Without reducing the significance of historical processes to these laws, they seek to show how certain laws, for example of energy and entropy in thermodynamics, may also be foundational in our understanding of historical categories such as 'work', 'power' and 'disorder'. The felling of forests for agriculture, the damming of rivers for electricity, the building of monuments for political power is the conversion of heat (energy) into work and work into heat, reflecting the first law of thermodynamics of heat energy conservation. The second law of thermodynamics holds that all currents have the tendency to fall from high (temperature, pressure) to low (entropy) and the great concentrations of energy will tend to dissipate and return to 'waste' (the ambient environment) (Bejan and Zane, 2013; Gilmartin, 2019) Deforestation leads to degraded ecosystems, agriculture to top-soil erosion and desertification, dams ravage water ecologies, species and livelihoods; monuments are toppled and empires lie in ruins.

In 'The Natural Science Underlying Big History' Eric Chaisson explains that the fundamental factor making natural and social dynamics commensurable is the 'energy density rate' expressed in the law of thermodynamics. Whether in cosmic evolution, in ocean-atmospheric processes or in urbanization, demographic trends, imperial maintenance or the human brain, it is the capacity to maintain the optimal rate of energy expenditure in the face of entropy that will or can promote creative evolution. It is worth noting here that most of the incoming solar energy today is needed to power Earth's climasphere, which includes those parts of the lower atmosphere and upper ocean that absorb (and re-emit) solar radiation and drive atmospheric motions and ocean currents (Chaisson, 2014: 33). Chaisson also notes that both order and entropy can increase together, 'the former locally (in systems) and the latter globally (in surrounding environments)'. The second law of thermodynamics demands that as any system – including a human social system – complexifies, its surrounding environment necessarily degrades (Chaisson, 2014: 5, 73).

Returning to the paradigm of oceanic flow, we can see how the designs of water flow can also be found in historical time. Theodor Schwenk has shown in considerable depth how certain archetypal forms of movement may be found in all flowing media, regardless of their chemical

composition. Water is the most suitable medium for the form-creating process which would be impossible in the three-dimensional world of solids where there is only exclusiveness and no interpenetration. 'In all things great and small the whole of nature is interwoven with interpenetrating rhythms and movements, and shapes are created in the interplay between them. Form patterns, such as those appearing in waves with new water constantly flowing through them, picture on the one hand the creation of form and on the other the constant exchange of material in the organic world' (Schwenk, 1965: 33–4).

Consider, for example, fluid dynamics. Concepts and figures to visualize flows in unsteady conditions such as streamlines, pathlines and streaklines have an uncanny similarity with pathways that historians follow. For instance, streamlines are a family of curves that are instantaneously tangential to the flow vector; we can think of temple communities changing their behavior in a certain direction during a secularization drive. Streaklines are particles of fluid emerging from a point at different times and drawing a line of their flows; think of tracking individuals or groups who have been through a revolutionary experience. These patterns may well be more visible with analysis of big data over time.

Schwenk suggests that even the human mind follows this design: 'the process of thinking partakes in the laws of the formative processes of the universe. These are the same laws as those at work in the fluid element that renounces a form of its own and is prepared to enter into all things, to unite all things, to absorb all things' (Schwenk, 1965: 96). Think of the vortex, upwellings and underwater eruptions for the ways the historical mind formulates the 'renaissance effect', especially in identitarian histories of civilizations and nations. The ocean as paradigm for natural processes is good to think history also because, as Kuhn says, there are connections between two referents in a network of similarities.

On the other hand, from the perspective of evolutionary complexity, it is clear that human capacities and consciousness generate an emergent creativity dependent upon, but not reducible to, biological and physical forces (Kauffman, 2008: 11–12; Ellis, 2020). Among human concerns is an urge to connect a collective past to a destiny through narrative, whether it be mythical, legendary, cosmological or historiographical (Ricoeur, 1980). The challenge is to relate the sequences of human thought and projects – historiographical time – to the oceanic paradigm. How do they insert themselves and how are they acted upon in this voluminous interactive world?

For most of human history, conceptions of time were continuous with natural flows or, at least, did not severely disrupt the designs of natural flows. Even such gigantic projects of imperial ambition as the Great Wall of China followed natural contours seeking to demarcate the steppe from the sown. The immense power of natural processes arguably generated

consonance in human cosmologies and understandings of temporality (Serres and McCarren, 1992: 7–8, 14). However, historiographical thinking as I have discussed it is at root a product of the human mind and, not withstanding Schwenk's observation of its logic, its modern tendency has been to overcome if not conquer the limits of nature – which may or may not represent a form of creative evolution.

In the final section, I turn to the ocean as the space of contestation between the more naturalistic forces of historical time and historiographic projects of human control. The ocean as *paradigm* for understanding planetary – including human – processes is being challenged *physically* and *materially* by human interventions driven by competitive nationalist and capitalist ambitions. To be sure, this is hardly to say that all modern historiography is purposively informed to challenge or overcome natural forces. Indeed, there is a growing trend towards connecting seemingly disparate historical processes which complicate project goals, especially in recent academic historical writing. Connected histories have the potential to probe the voluminous nature of myriad and multi-scale relationships – to unite and absorb, in the words of Schwenk – across the planet. But linear histories of modernization or nationalization still dominate the political understanding of history globally.

One of Kuhn's principal interests was in grasping how paradigms change. Arguably, a paradigm is often recognizable only when it begins to break down. I believe we are at a moment when we are beginning to see the paradigm of *exemplary* oceanic time collapse or be overcome. The degradation and transformation of the physical ocean scrambles the guiding function of the paradigm. Here the relationship between paradigms (i) and (ii) becomes less metaphorical and more causal. The crisis of the Anthropocene sensitizes us to probe the oceanic paradigm not only as a mode of historical inquiry but also the different ways in which human communities have organized their relation to oceanic and natural temporalities.

Humans and Oceans

Since we evolved from the oceans roughly 30 million years ago, histories have not given sufficient salience to oceans as a factor in terrestrial lives, particularly in comparison to rivers, which play a more directly observable role. Oceans have, of course, vitally conditioned human lives through the climates that they generate. Not only do climate patterns shape historical decisions, strategies and activities (e.g. military or agricultural), but oceanic patterns sustain life, and events such as El Niño, cyclones, hurricanes and tsunamis affect entire populations.

The human relationship to the ocean represents one of the most important ways to scrutinize the changing relationship between the time of history and temporalities of nature. Currents and their

geo-atmospheric interactions have influenced climate in different regions of the world. Take for instance the Gulf Stream flowing northwards along the Atlantic coast of the Americas and then veering off to the east before reaching the Canadian coast and forking towards northern and southern Europe. This explains why Canada's east coast is frozen much of the winter where England is not and why Western European shores, including the Norwegian coast, are milder than similar latitudes to the east and west (Misachi, 2017; Miller, 2017; Schwenk, 1965: 81). The above mentioned slowing of the ocean conveyor belt due to polar ice melt is now contributing to colder European winters.

South Asian agriculture is heavily dependent on the monsoon rains. From the 1970s, Indians started to feel that progress in dam building, canal irrigation and tube-well technology were liberating them from this overwhelming dependence. However, 60 percent of Indian agriculture still depends on the monsoons and their recent patterns have been erratic, even as groundwater levels are declining precipitously due to overuse. The reasons are not only national and regional (factors contributing to climate change, including depleting aquifers, are plentiful within South Asia), but planetary. Sunil Amrith has shown how scientists in the early 20th century observed that the monsoons appeared to correlate with reversals in the pressure gradient across the Pacific Ocean. Accelerated global climate change has destabilized the monsoon and there are dire predictions of desertification across south and west Asia (Amrith, 2018).

For the vast span of history, humans have largely avoided interfering with such powerful natural forces as the ocean, which they considered to be beyond their ability to control or manipulate. Still, to the extent that the oceans have impinged on human life, they have dealt with it in a variety of ways. Historically, cosmologies generated modalities of managing such forces, including the idea of maintaining an accord or adapting to natural energy flows, developing and manipulating them rather than the ambition to acquire full mastery over them. Rituals performed on a routine basis or to avert cataclysmic events sought ultimately to appease the forces of nature. The myth of the deluge as a foundational element can be found in almost every ancient culture. These beliefs, ideas and practices should be understood as experientially grasping some fundamental dimension of the human relationship with the natural world that is missing or misunderstood in the modern historiographical vision.

In pre-modern China and India, cosmologies were adapted to natural processes – largely understood in cyclical modes – both at the level of routine activities and in political thought. With full recognition that such generalizations about cosmologies can easily be romanticized – especially because there were powerful tendencies for human power to seek to overcome natural processes – it is important to explore how and why the natural conditions were normatively idealized. Thus, Vedic cosmology identifies the highest good with the total harmony of the cosmic or

natural order. Indeed, the social and moral order was seen as a correlate of the natural order and the belief that the universe goes through repeated cycles of creation, destruction, and rebirth joining the two realms. Buddhism held similar notions of time; it also produced the fundamental idea of ‘dependent arising’ which established the interdependence of nature and all beings. Daoists were of course the most emphatic about following the course of nature – and their favorite metaphor is water, even though they sought to master its esoteric secrets.

Human communities have also had to live by, utilize and manage oceanic flows for travel, trade or livelihoods. Research of communities who live by the ocean, whether in the ecotones of islands and coasts or amphibian communities and organisms, may be especially useful in identifying processes that could provision us with alternative historiographical narratives for sustainable management. The early oceanic travelers, most famously the Polynesians, reveal how the inter-mediation between nature and artifice could generate great and sustainable achievements on the oceans.

The most obvious distinction between these early oceanic travelers and today’s ships is that their vehicles were a light medium, not freighted with capital intensive technology driven by a purposive rationality linked to capital accumulation. Over three millennia, these ocean-goers connected over a thousand islands in the vast zone known as the Polynesian Triangle, which link the points of Hawaii, New Zealand, and Easter Island. Their principal technology was the double-hulled out-rigger canoe and numerous navigational techniques to interpret the stars, currents and swells, wind and weather patterns and signs from birds and fish, among others. They developed devices such as charts of wind and wave patterns, location of stars and spatial figures of islands. From experiences conveyed across generations through storytelling and song, they were able to combine large but predictable, long-term climatological events with local, seasonal winds to propel people from one archipelago to another (Thompson, 2019: 286–95; Lichtman, 2016).

The question often raised is would they have done the same to the oceans as we moderns if they had had the advanced technological means to dominate it? I aver that is not the point. Whatever the trajectory of the Polynesians’ intent, we are made aware that science can develop more sustainably when not dominated by a technological rationality in the service of an unsustainable capitalism.

In this context, thinkers from the global indigenous peoples’ strategic alliance, especially from the Pacific islands, have developed a ‘decolonizing’ language for their projects that draws from the ocean. The Maori intellectual, Linda Tuhiwai Smith, has sketched a figure to represent their agenda modeled on the ocean as the giver of life and pattern of time. ‘Within the greater ebb and flow of the ocean are smaller localized environments which have enabled Pacific peoples to develop enduring

relationships to the sea', she says. She draws four concentric circles – decolonization, healing, transformation and mobilization for self-determination – represented as tides. Smith regards them not as ends in themselves but as processes which connect, inform and clarify the tensions between the local, the regional and the global (Smith, 2012: 116–17).

Unsurprisingly, this movement of indigenous peoples has gained attention in the Anthropocene as the communities which are perhaps the first and most to be affected by climate change and rising oceans. It is instructive for us to study their assumptions and modes of managing the oceans sustainably. The point that needs emphasis is that while the dominant values and goals of a society – in our case, it is now largely global – may or may not be successfully achieved, without the normative ideal, it will be nigh impossible.

Oceans presented the limits of human capacities even among the seafaring countries of Europe. Well into the Renaissance, the Pillars of Hercules marking the passage between the Mediterranean and the Atlantic Ocean was said to bear the warning *Non plus ultra* ('nothing further beyond'), serving as a warning to sailors and navigators to go no further. It was not till the second half of the 18th century that the notion of history as the property of a subject – a nation or civilization – in linear time, tunneling through the past into the future, became the dominant mode of temporal knowledge, first in northwest Europe and subsequently across the world in the 20th century. The factors that combined to produce the linear conception of time in Europe are complex; conceptions of religion, science and the quest for global resources generated the temporal framework – of abstract, measurable time – for a capitalist mode of endless accumulation. The growing mastery of the deep seas was the indispensable condition for competitive global capitalism. It is perhaps not entirely coincidental that this is also the time when modern historiography begins to appear, departing from the paradigmatic oceanic temporality of cycles and returns and increasingly dominated by national interests and goals.

Parting the Ocean

Originally conceived to develop a conceptual basis for the German *Grossraum* (Reilly, 2009), Carl Schmitt believed that the European *nomos* could not be conceived to extend over the oceans. In Schmitt's view the *nomos* refers to the legal authority to order society, chiefly to divide and distribute the land and the 'capture' or 'appropriation' of the world's resources (Raschke, 2019). Even after four centuries of deep-sea navigation, what Schmitt described as the 'antithesis of land and sea as an antithesis of diverse spatial orders' remained (Schmitt, 1950: 54). In contrast to the territorial sovereignty over land, the sea was free. 'It could be freely exploited by all states [...] it had no borders and was open.

Naturally, it was decisive that the freedom of the sea also meant the freedom to pursue wars' (Schmitt, 2006 [1950]: 179, 352). It also became the license to occupy and dominate people and resources beyond the seas – beyond the pale of the civilized *nomos*.

Between the First and Second World Wars, this Eurocentric *nomos* of the earth ended. In the Panama Declaration of 1939, the US was the first to declare its specific security zone extending 300 nautical miles into the Atlantic and the Pacific. The last frontier on the planet was being readied for territorialization. Technological developments such as submarines and air-power added to this control, robbing the ocean of its elemental character. Sovereignty contests and claims daily extend further and deeper into the sea, much like landed spaces.

If oceanic violence was restricted mainly to surface waters and sea-catch until the end of the 19th century, since the 20th century humans have been penetrating the voluminous depth of the ocean, leaving us with a predictable disaster scenario. It has been an industrial colonization, battered by massive commercial traffic and fishing, nuclear testing, constant bombardment for oil and gas explorations and militarized island buildings, among other invasions. Not least, it is being strangled as the dumpsite of the terrestrial planet. The modern idea of the conquest of nature and the institutionalized and technologized modes of exhausting it are unprecedented. The hubris that human history can destroy, negate and transcend the medium of its sustenance is the mad thought that we face.

As deep-sea technology advanced and fossil fuels and minerals were being found deeper into the bedrock of the oceans, nations were beginning the race to make claims farther and farther into the ocean. By the first 15 years of the 21st century, off-shore oil drilling accounted for 30 percent of the global oil production. Not only does it entail CO₂ and methane release, but permanent drilling structures, nuclear power plants, wind turbines, floating harbors, liquid hydrocarbon storage facilities and terminals extend and penetrate deeper into the ocean (USEIA, 2016). Enormous ports for tankers and trawlers multiply year by year, as does island building, and not only by the PRC in the South China Sea. Demand for sand and other materials in Singapore over the last four decades has led to the disappearance of about 25 islands around Indonesia (Cross, 2019).

Conservation science is increasingly concerned about the damage to deep-sea ecosystems by increasing ocean acidification and industrialization. In the next decade, 300-ton vehicles will be sent to the seabed to harvest minerals (in many cases for green technology). But these resources are also home to myriad and often fragile ecosystems. Manganese nodules which were once thought to grow very rapidly turn out to actually take 10,000 to a million years to grow. The conservation groups have had some success in drawing the attention

of the principal regulator, the International Seabed Authority of the UN, which is preparing a body of regulations to govern deep-sea mining from 2020. Despite its efforts, the UN is fundamentally hampered by the fact that it is beholden to nations (Cobley, 2019).

Viewing the problem from the perspective of international law or the UN Convention of the Law of the Sea (UNCLOS), we see clearly the driving forces behind this invasion. The UN has sought successively to regulate the extent to which nation-states can control the oceans and its resources. In 1982, the majority of the nations (excluding the US) agreed on a nation's extension of its exclusive economic zone (EEZ) to 200 nautical miles (nm). Should every coastal state make this national jurisdictional claim, it would cover 43 million square nautical miles or approximately 41 percent of the oceanic area. Not satisfied with this, coastal states demanded that the EEZ of 200 nm be extended from the edge of the coastal state's continental shelf, leading to further jurisdictional cover. Not only is this new edge difficult to measure but the extensions have also led to overlapping national claims, causing potential and actual conflicts. Other principles evoked by the states, such as the (contestable) claims of 'historical' maritime jurisdiction, make the fraught situation more warlike. The contemporary cases of China in the South China Sea and Russia in the Arctic Circle are simply the most prominent of these (Schofield, 2012).

The conquest of nature as the means to achieve human satisfactions is the driving force of modern historiography as conceived by nation-states. At the same time, the study of the record of the nation's struggles and achievements has been kept separate from the study of nature. I have tried to argue that historical time ought to be seen in terms of natural processes more than we have done heretofore. As such, it is continuous with the nature of oceanic flows. For this purpose, I have rendered the historiographical process that is uniquely human to the background as something to be grasped in relation to the former. However, reflexive historiography remains powerful in its impact on the world. The record of human achievements is a condition of the capacity of humans to both dominate and manage nature.

Can this reflexivity be turned to develop a more sustainable relationship to nature? The powers of symbolic representation that gave humans the capacity to control other beings in the evolution of life may well have met its match in the revenge of the oceans. The greatest threats to the human world today appear from the oceans, from its acidification and rising sea levels to geo-atmospheric transformations of recognizable climate patterns. The question that arises is the extent to which the Anthropocene, an era where human activity represents the greatest influence on climate and the environment, will ravage the ocean and the degree to which the ocean will ravage us.

The revenge of the ocean also tells us that merely reducing fossil fuel emissions cannot address our problems. The treadmill of ever-increasing consumption for profits and GDP growth embedded in the deeply institutionalized cosmology of our times demands change. Is there still a way to reconcile the creative capacities of humans with the limits of nature? Can we develop collaborative and imaginative ways to identify scalar transformations and potential counter-finalities to move us in a more sustainable direction? The re-direction of historiographical knowledge to accord better with the nature of historical time and the sovereign planet could mark a step towards it.

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