The Watchman's Part:
Earth Time, Human Time and the "World Scientists' Warning to Humanity"

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Abstract: In this article I discuss three "Warnings to Humanity" about the state of the global environment, signed by global networks of scientists and published in 1992, 2017 and 2019. I place these in the context of the long practice in human culture of separating and relating different registers of time: the human time of communication and recollection, and 'inhuman' times such as the time of the gods, culture heroes, or latterly Earth history. I suggest that in the Anthropocene the ability of geological and meteorological tropes to control the semiotic relations between lived human time and deep, planetary time is being disrupted. I then use speech act theory to analyze how the language of the three "Warnings" works to position the scientist signatories as accredited "watchmen" monitoring the changing relations between human and Earth time, and wider humanity as exposed to knowing culpability in ongoing global environmental deterioration. I conclude by suggesting that the meshing of human and Earth time is stretching the representational capabilities of the natural sciences to breaking point, and that the environmental humanities should also play an important role.

Keywords: warnings, deep time, history, speech acts, climate change, Anthropocene

> So great a Prophet … might have at some speciall times more then ordinary motions and impulses in doing the Watch-mans part, of giving warning of Judgements approaching. (Bernard 1656: 91).

2017 was a year of extreme weather. There were severe droughts in the United States and East Africa, unprecedented marine heatwaves off Tasmania, widespread fires in Australia, calamitous flooding in Uruguay and Eastern China, and a record-breaking hurricane season. When the American Meteorological Society later published the seventh edition of their annual report *Explaining Extreme Events from a Climate Perspective*, analysing the events of 2017, they chose to use stronger language than ever. As Jeff Rosenfeld, the editor-in-chief of the Bulletin of the American Meteorological Society, said in a press release about the report, "these attribution studies are telling us that a warming Earth is continuing to send us new and more extreme weather events every year. … The message of this science is that our civilization is increasingly out of sync with our changing climate" (American Meteorological Society 2018: 1). Perhaps most significantly, the authors of the report concluded that many of the events of 2017 would have been "virtually impossible" without human-induced climate change (Herring et al. 2019: S1).

2017 was also the 25th anniversary of the publication of the "World Scientists' Warning to Humanity" (Kendall 1992). This short but powerful statement had been written by the Nobel-prize winning particle physicist Henry W. Kendall, signed by over 1,700 leading scientists and published by the Union of Concerned Scientists (UCS). It listed six areas of critical stress being imposed on the global environment, and concluded that "a great change in our stewardship of the earth and the life on it is required, if vast human misery is to be avoided and our global home on this planet is not to be irretrievably mutilated" (Kendall 1992: 1).

To mark this anniversary, and in the midst of a shifting climate, a group of ecologists at Oregon State University's College of Forestry collaborated with the UCS and other scientists to publish "World Scientists' Warning to Humanity: A Second Notice" (Ripple et al. 2017). In this new "Warning," Ripple and his co-authors "evaluate the human response" to the earlier "Warning," judging that "humanity has failed to make sufficient progress." They listed thirteen steps, from the creation of habitat reserves to population control, that they feel are necessary if humanity is to make a meaningful transition to sustainability, and repeated the formula of collecting thousands of scientist signatories around the world.

The authors of the "Second Notice" clearly wanted this act of scientific advocacy to be more than a one-off event. In the article they announced the founding of a grouping of scientists known as The Alliance of World Scientists (AWS), which describes itself on its website as "a collective international voice of many scientists regarding global climate and environmental trends and how to turn accumulated knowledge into action" (Alliance of World Scientists 2017). Two years later, Ripple and co-authors used the occasion of the fortieth anniversary of the First World Climate Conference in Geneva in 1979 to repeat the exercise, publishing a "World Scientists' Warning of a Climate Emergency," again with thousands of scientific signatories, in which they highlighted the danger of passing irreversible climate tipping points and set out "six critical and interrelated steps" that could "lessen the worst effects of climate change" (Ripple et al. 2019: 10-11).

It might seem strange to start an article on these events in science advocacy with a quotation from Nicholas Bernard's 1656 biography of Bishop Ussher. James Ussher (1581 – 1656) was a conservative, puritan Irish Anglican Archbishop, infamous for his intolerance of Catholicism – but perhaps better known for using the Bible to calculate the exact date of the creation of the cosmos as 22 October 4004 BCE. But it seems that it is now scientists that are the new "watchmen,"

the new prophets, those that are empowered by society to give warning of approaching judgements.[1]

By the term "prophet" I mean something quite specific here. Unlike apocalyptic speech, prophetic speech typically refrains from making specific predictions about future events – although climate and other scientists do that too. Instead, prophecy uses "future talk" mainly as a way of judging and making demands on the present. According to Richard Fenn (1982), prophetic talk can be seen as "serious" or "operative" speech that has in some sense "leaked out" from its usual liturgical setting into wider social life (104). Environmentalism has long used such speech acts and cadences, drawing on traditions of public speech with roots in Christian preaching (Szerszynski 2005). Ripple et al. pronounce a judgement on humanity – not only in regard to its impact on planetary systems, but also its failure to respond to the earlier "Warning" – and try to use this to effect a change of heart. The evidence that global society seems not to have departed from its disastrous course, despite the evidence, seems to confirm Rosenfeld's judgement that human society is "out of sync" with the changing Earth system.

The meshing of times

But another way to describe what is happening in what geologists call the Anthropocene is a *coming into sync*. As historian Dipesh Chakrabarty put it, "anthropogenic explanations of climate change spell the collapse of the age-old humanist distinction between natural history and human history" (Chakrabarty 2009: 201-7). Human time and Earth time seem to be meshing together, even becoming indistinguishable. The collection of graphs presented in the two AWS "Warning" papers show a mixture of ecological and socioeconomic indicators, all displaying inexorable trends up or down over the second half of the twentieth century, resonant of the Great Acceleration graphs of Steffen et al. (2015). They suggest that human and geological time are indeed flowing into each other.[2]

But if human time and Earth time are merging, that implies they must once have been separated, posited as separate chronological registers – and such an act of separation always involves actively controlling the relations between them. The combined separating and bringing together of human and inhuman times is a common cultural dynamic, one in which the process of mediating between the different kinds of time can only occur through specific cultural forms (Szerszynski 2017).

The *human time* of individual human witnessing and recollection itself has first to be separated out from the immersion of the human organism in its environment. Philosophers have suggested that this separation of human and natural time is an important component of anthropogenesis, the origin of human subjectivity. For the speculative anthropology of Georges Bataille, writing in 1948, the decisive yet ambiguous moment of anthropogenesis occurs with the creation of a world of objects and utility, which results in a "lost intimacy" with the immanence and immediacy of animal being (Bataille 1989). Hannah Arendt similarly concludes that it is only in the enduring context of the artefactual world that human beings become individual, mortal beings. For Arendt, animals are immortal, part of the never-ending flow of life (*zoe*). But in the context of a stable artefactual background, human beings become mortal individuals, with a recognizable life story (*bios*) from birth to death (Arendt 1958: 97).

But this human time seems always to have been experienced as existing in contrast to another, *inhuman time* – in some sense a timeless time. Perhaps Bataille is right that this is an echo of the almost-forgotten and mourned immanence of animal existence. For most of human history this seems to have been understood as the time of gods, spirits or other supernatural beings (Foxhall

1995). In the time of urban civilisations and territorial empires the main form of "inhuman" time was the time of heroes – whether the culture heroes involved in origin stories, or more recent heroes made immortal in battles and conquests. But in modern Europe from around the end of the eighteenth century, a new trans-individual temporal experience took shape: behind individual accounts (*Historien*), and joining up individual events (*Geschichten*), was *history* (Koselleck 2004). Here we must thus slightly amend Chakrabarty's account: the modern, humanist idea of canonical historical time is already in some sense inhuman – or at least human in a very different way – in that it is distinct from the time of individual communication and recollection

However, the boundary between what Jan and Aleida Assmann call "communicative" and "cultural" memory (e.g. Assmann 2008) is complex, active and mobile. The relation between private and public recollection is typically organised around a moving present, covering about four generations, with older generations continuously falling out of it and new generations born into it. The historian of Africa Jan Vansina (1985) calls this the "floating gap" between informal and formal shared memory. However, this gap is far from empty of activity. In oral societies, human time and the time of mythic origins are continually braided together through collective mnemonic practises: ritual, enactment, narrative, and song. In nation states and empires the act of at once separating and relating ontologically distinct modes of time is also often done through *monuments* around which it is felt that different spatial and temporal registers come together in a privileged way (Szerszynski 2017).

At about the same time that modern, historical human time was being invented, the idea also took shape that the Earth had its own, deep temporality (Rossi 1984). The Earth itself became understood as historical, the subject of a history that extends in deep time, independent of and subtending human history. The emerging science of geology learnt how to manage the relation between human and geological time, stabilised primarily through a "monumental semiotic" employing rock sections, or cores of ice or sediment. This helped to consign this newly discovered time of the Earth to the timeless time of a distant, inhuman, one might say "godly" past, remote from human action or opinion (Szerszynski 2017).

However, the growing awareness of changes in planetary systems captured under the term "Anthropocene" has upset the idea of keeping geological time at a godly distance. 2017 broke records, and was not the first or the last year that would do so. Geological time seems to have accelerated – to be going so fast that society cannot keep up. Weather events from year to year are experienced less like an eternal return of the same, as manifestations of the Earth's timeless time, and more as unique historical events on a linear trajectory into an open future, as "the coiled cycles of annual weather patterns unravel into the irreversible time of the *longue durée*, and each storm and drought becomes unseasonable, unique, historical" (Szerszynski 2010: 24). It seems to be not rituals or monuments that perform the meshing of human and Earth time, but storms, floods, droughts and records broken. And these "more than ordinary motions and impulses" of the Earth seem to incite similarly extraordinary impulses in our contemporary scientific "watchmen" – to pronounce and declare, to give verdict and warn.

Words of warning

How do the new "Warnings" enact the "watchman's part"? Warnings are a good example of what the philosopher J. L. Austin (1962) called "performatives." Performatives are a special kind of utterance, "speech acts," that aim to alter the world, to change relationships or behaviours – in Austin's memorable phrase, to "do things with words." To use Austin's formulation, the "Warnings" are *locutions* (in this case, in written form) that are also *illocutions* or performative acts (in this case,

warnings), and as such have to follow certain formal patterns – and if they are successful in bring about the desired social effect, they are also successful *perlocutions* (Austin 1962 :98-102).

Through his analysis of performatives, Austin expanded the idea of what it is for utterances to be well-formed and successful. Although performatives may contain embedded statements that can be judged true or false, taken as a whole they cannot merely be judged on the grounds of truthfulness or accuracy. Austin used the term "felicity" to describe the conditions for success of any specific kind of illocutionary act. So, for example, to have said to have promised someone something, Austin says, it is necessary both that the promise has been heard by someone, and that they understood the utterance as a promise (1962: 22).

One way to identify performatives is by spotting what in a legal context are called "operative words" – words that in themselves effect a change of state, such as transferring property, marrying, becoming a citizen or being found guilty. As Austin acknowledged, performatives sometimes do not contain operative words, and the performativity is instead implied – but in the three "Warnings" operative words make their appearance. The 1992 "Warning" uses formal, operative language: "*We the undersigned* … *hereby warn* all humanity of what lies ahead" (Kendall 1992: 1, emphasis added). The 2017 "Warning," perhaps in deference to the conventions of scientific papers, doesn't use operative words about itself; however it calls the 1992 "Warning," with which it presents itself as linked, a "declaration" (Ripple et al. 2017: 1026). The 2019 climate emergency "Warning" opens in more overt operative mode: "Scientists have a moral obligation to clearly warn humanity of any catastrophic threat … On the basis of this obligation and the graphical indicators presented below, *we declare …* that planet Earth is facing a climate emergency" (Ripple et al. 2019: 8, emphasis added).

Another sign of a performative is a particular overt reference to the utterer of the locution. The truth or falsehood of scientific statements are in principle seen as independent of the speaker – hence blind peer review. But performatives have to be spoken by the right people. Performatives thus often involve the use of "I" or "we," or the attachment of a signature (Austin 1962: 60). Austin suggests that warnings belong to the class of performatives he calls "exercitives," which are "the exercising of powers, rights, or influence," such as appointing, voting or ordering (Austin 1962: 150). So whereas for a conventional scientific paper the number or status of authors should in principle be irrelevant, it is important that the deliverer of an exercitive is seen to have those powers and rights. The power to warn in the three "Warnings" is warranted by the number and status of the signatories. In the 1992 "Warning" the (truncated) list of signatories is longer than the warning itself – it says it was signed by "[o]ver 1700 scientists, including 104 Nobel laureates – a majority of the living recipients of the Prize in the sciences" (Kendall 1992: 2). The 2017 "Warning" gained over 15,000 signatories – "as far as we know," the authors wrote, "this is the most scientists to ever co-sign and formally support a published journal article" (Ripple et al. 2017: 1028), and the 2019 "Warning" over 11,000.

As well as looking at the documents as a whole as warnings, we can look at specific warning formulations within them. Sometimes in the papers the warning is presented as a hypothetical "if-then" (see Searle 1969: 67). "To prevent widespread misery and catastrophic biodiversity loss, humanity must practice a more environmentally sustainable alternative to business as usual" (Ripple et al. 2017: 1028). "To secure a sustainable future, we must change how we live" (Ripple et al. 2019: 10). At other times we see clear exercitives, or what Searle (1969) calls directives, such as "we urge" (Ripple et al. 2019: 11). But other speech acts are close to bald unconditional statements – "we should," "we must," "we need to" (Ripple et al. 2019: 11). They seem to draw on the registers of scientific objectivity to give a sense that we are helpless before the facts; that acting is not optional.

The great uncovering

The message of the "Warnings" is that the Earth is acting, and that humanity cannot *not* act. In particular, the "Warnings" make it clear that if we choose not to act, we have no excuse. The English verb "to warn" derives, via the Proto-Germanic word **warōnan*, from the Proto-Indo European root **wer-*, "to cover," which root gives us other English words such as "cover" itself, "guarantee" and "warranty." This etymology suggests that the original meaning of "to warn" was about covering and protecting – perhaps related to another PIE root **wer-*, meaning to "look out for," which gives us words such as "warden," "steward" and "beware."[3]

But in the three "Warnings," "to warn" seems to carry a rather different resonance – "to *un*cover," "to expose," and thereby "to make responsible." It is not insignificant that the 2017 "Warning" has the subtitle of "a second notice." "To give notice" is a particular kind of performative. As the Oxford English Dictionary (2020) says, "notice" in this sense means a "[f]ormal or official intimation or warning of something; public announcement or notification." If a person has been "given notice," or "put on notice," any future professions of ignorance of the consequences of their actions they may make will have no exculpatory effect. Calling the 2017 "Warning" a "second notice" suggests not just that in the future humanity will not be able to say that they were not aware, but also that they have *already* been warned before and did not act. To use Austin's language, the 2017 and 2019 "Warnings" also serve as "verdictives" (Austin 1962: 152-4) – pronouncing a verdict on humanity's record to date. The word "apocalypse" means "uncovering:" the watchmen of the global environment seem increasingly concerned to remove the "cover" enjoyed by the institutions of modern society, exposing their ongoing culpability.

However, if the meshing of human and earth time is now being enacted through unique socio-environmental events, this combined time also stretches the representational capabilities of the natural sciences to breaking point. In the context of the geological epoch-in-the-making of the Anthropocene – in which the human being is not just the detached knower and coherer of the Earth and its deep history, but a being involved in the very shaping of the Earth – the geological consignment of Earth time to a timeless realm, with a singular story, and insulated from human contestation, debate and responsibility, becomes harder to maintain (Szerszynski 2017: 126-8). It is also becoming increasingly hard to ignore the experiences of non-Western peoples and colonised peoples, whose historical experience belies the "Warnings'" unified narrative of a culpable "humanity" facing a unique global environmental apocalypse. To address such challenges we need approaches that transcend the boundaries between academic disciplines. It is not only natural scientists, but also those in the environmental humanities, that are called to play "the watchman's part."

Notes

[1] The preferred gender-neutral term for "watchman" today is "security guard" – but this has much narrower cultural resonances so I am using the older but unfortunately gendered term.

[2] The graphs in the 2017 "second notice" are each bisected by a vertical line at the year 1992, drawing attention to the way that unsustainable trajectories have continued unabated even after the UCS "Warning."

[3] Etymological derivations are from https://www.etymonline.com.

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