

Liberating clocks: exploring other possible futures¹

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Abstract This paper suggests that alongside concerns regarding the future of precision time-keeping, there is also a need to discuss the future of time-keeping in social life. Pointing to the way that maps are created to fit a range of different user-needs, I ask whether methods of telling the time might also be made more open to experimentation and redesign. In order to provide examples of how this could be done, I draw together a range of projects by artists and designers who are using clocks in unexpected ways. Looking at examples that particularly focus on social aspects of environmental issues, I show how the clock can be a useful tool for highlighting alternative ways of keeping time. Drawing on work in temporal design, developed in collaboration with designers Larissa Pschetz and Chris Speed, this paper suggests a new development in the field of horology, toward a critical horology that emphasises the political, social and environmental aspects of time-keeping.

Introduction

The 2016 Science of Time conference, subtitled ‘time in astronomy and society, past, present and future’, has offered a range of insights into the ways that time-keeping might respond to changing user needs. These changes were exemplified in the call for papers by references to shifts in standards, in methods of distribution, and in the definitions of units and timescales. As a philosopher interested in the role of time in social life, my paper offers another possibility for the

¹ This paper draws on ideas from a longer paper on “Liberating Clocks” which is forthcoming in the journal *New Formations*.

future of time-keeping, namely that clocks and clock-time might respond, not only to the changing needs of science, but also the changing needs of society more broadly. I first suggest that the humanities have much to learn from discussions occurring within the community gathered together by ‘the science of time’, particularly my own field of continental philosophy. However, I also suggest that deliberations on the science of time might be usefully broadened out through attention to work arising from art and design. In particular, I showcase examples of ‘clocks’ that highlight alternative ways of measuring and telling the time, and thus open up the field of time-keeping to broader applications and experimentation.

A single objective clock time?

Within my own discipline, specifically continental philosophy, clock time is generally thought of as being external to society and thus not particularly capable of addressing social issues of core interest. A good example of this can be seen in David Couzens Hoy’s *Time of Our Lives* where he writes that the “term ‘time’ can be used to refer to universal time, clock time, or objective time. In contrast, ‘temporality’ is time insofar as it manifests itself in human existence” (Hoy 2009, xiii). To unpack this a little, in listing synonyms for ‘time’,

clock time is assumed to be roughly equivalent to ‘universal time’ or ‘objective time’.² Further, clock time is placed in opposition to the kind of time that appears within ‘human existence’, or what Hoy refers to as ‘temporality’. Importantly, given that continental philosophers are particularly interested in temporality, rather than time, this means that clocks and clock time are, more often than not, placed outside of their sphere of main concern.

However, this kind of philosophical approach has much to learn from time metrology, time standardisation, and horology. While the norm within continental philosophy is to assume that clock time refers to a single, measurable, objective ‘time’, and is thus incapable of dealing with more complex approaches to time, a brief review of work presented at this conference significantly challenges this. Daniele Rovera described UTC as something that is ‘produced’, rather than simply measured, thus suggesting a larger role for social and technical processes in time-keeping than continental philosophers have acknowledged. Further, Dennis McCarthy highlighted the mul-

² Note that Hoy does not use ‘universal time’ in any technical sense here, but rather refers to a somewhat vague idea of astronomical time.

multiple timescales available for scientific use and described them as a 'family', even providing a family tree. Speaking even more directly to the incorrect assumption that there is a single way of measuring time, Danny Hillis discussed the multiple kinds of 'time' (e.g. Derived Solar Time, Monotonic Corrected Time, Planet Display Time) that will feed into the time indicated by the Clock of the Long Now. His comment that this complexity was rarely acknowledged by the general public was met by audible and knowing agreement from attendees and chimes with my experiences in my own discipline. Even what was called a clock was much more open and nuanced, since speakers talked of stars, radioactive decay, pulsars and black holes all acting as 'clocks'. Each one of these claims challenges continental philosophical 'common sense' and could potentially encourage a deeper curiosity within the discipline about how time-telling should be understood.

Work presented at the conference also offered further challenges to the assumption that the tools and methods for telling time are separate from human existence, as Hoy supposes. For example, Sara Schechner demonstrated the role of power and authority in the crea-

tion of sundials, arguing that they can be read for so much more than the time they tell (e.g. Schechner 2001). McCarthy also recalled previous conversations held within the time metrology and horological community about the ways that time is shaped by political authority. This included stories of Ancient Romans bribing the Pontifex Maximus to make a year shorter or longer (Hewitt Key 1875, 230), while in Egypt, Pharaohs were required to swear to not make any changes to the calendar when they took the throne (Richards 2000, 110). A further example came from Steve Allen's presentation on time zones, where the production of the tz database brought to the fore the difficulties of responding to technical and political challenges within the same system. Thus for those interested in the future of time-keeping in social life, the approaches taken to time within time metrology and horology are worthy of far greater attention.

Prioritising precision time-keeping?

Even so, the rest of my paper suggests that just as continental philosophers can learn much from scientific approaches, these scientific approaches might also be usefully expanded by looking at the interventions of artists and designers into questions of time measurement and time-keeping. More specifically, I suggest that these interven-

tions question the priority given to the development of greater precision and accuracy. Throughout the history of time-keeping, a history that was reflected in the conference, it is generally accepted that progress towards these aims has been achieved by improving methods for dealing with external perturbations. Indeed, in a number of presentations, speakers talked of needing to ‘immunise’, ‘insulate’ and ‘isolate’ clocks from the effects of social and material processes. Of particular resonance for a humanities scholar, was William Andrewes’ discussion of the design of the Harrison clocks and the observation that a heavy pendulum is problematic, because it ‘remembers everything’ (the example given by Andrewes was the vibrations from a horse and carriage going past outside). A light pendulum, on the other hand, ‘forgets’ more easily, and is less affected by its surroundings. Further, speakers argued that other potential problems to do with cosmological time or time signalling led to a need to make assumptions about symmetry and homogeneity, either for the sake of ‘progress’ in cosmological time telling (Impey), or for more pragmatic reasons of having a time service that works within acceptable error margins (Levine).

My proposal, however, is that we see the emphasis on concepts such as accuracy, reliability, homogeneity and precision, as one particular focus, and to also seek to explore the possibility of other futures for time-keeping. To do this I will draw on work I am engaged in with colleagues at the University of Edinburgh around the idea of temporal design (Pschetz et al. 2016). That is, while the conference had a (very reasonable) emphasis on scientific and industry needs (with an odd reference to high-frequency trading), our work explores why we might want to develop forms of time-keeping that tell us about imprecise, unreliable, complicated and unpopular times. In particular, we ask what it might be like to make clocks that are not immune to, or isolated from, physical, social and political perturbations (understanding the latter term here in its broadest sense) but rather ones that respond to them.

Importantly my aim here is not to reject the interest in precision and other accompanying issues, but to amplify a point that was made a number of times at the conference. Namely that different ways of calculating time are used for different purposes and that this is essential to scientific research. Building on this, my question is wheth-

er time metrologists and horologists might not also join with artists and designers in developing a greater attention to the provision of different kinds of time that address social, political and personal uses, alongside those of science and industry.

Contrasting cartography and horology

One reason why I am prompted to ask this question is through a comparison between horology and cartography. When it comes to making maps it is widely accepted that there should be different kinds of maps available for different purposes. Importantly, within cartography, there is no assumption that all maps should be subsumable to a standardised, accurate, precise and homogenous space. Instead maps are more often developed through attention to the spatial problem that needs to be solved and to the optimal way of providing the information needed. Maps for using an underground transport system, for example, are very different to those used for orienteering. In fact it has been argued that a key reason why the London Underground Map has become so iconic is precisely because it does not bear a relationship to a precisely calculated space (Hadlaw 2003, 32).

Further, critical cartographers have argued that beyond their role in providing specific kinds of information, maps are “vehicles for social and political expression — of values, goals, aesthetics and status” (Wood and Fels 1986, 54). The controversy of the Peters projection, which challenged the perceived Eurocentric bias of the Mercator projection, provides a good example here (see Crampton, 1994). Taken together, it is clear that a map does not always need to show the ‘right space’ (e.g. according to an internationally agreed standard) in order to do its work (whether this be in simple terms or more politically complicated ones).

By contrast, however, when a clock does not show the ‘right time’, it is generally perceived that the clock has failed. Additionally, despite the work of those such as Schechner and Kevin Birth (2012), descriptions of clocks as ‘vehicles for social and political expression’ can still be met with confusion and disbelief by members of the general public, but also in certain academic circles. An important implication of this is that in comparison to maps, the idealised version of the clock – as the device that shows the ‘right time’ – is endowed

with much less flexibility in how it can assist in solving temporal problems.

Temporal design ‘for the people’

In their introduction to critical cartography, geographers Jeremy Crampton and John Krygier argue that one of the benefits of a more politicised approach to maps is that they have been “freed from the confines of the academic and opened up to the people” (2005, 12). In particular they highlight artistic experiments with the form of maps as providing examples for how the theoretical critique of maps might be addressed in practice (2005, 17). Likewise, I would argue that a critically-oriented approach to time-keeping could also find much inspiration in the challenges presented by artists, designers and activists to the standard form of the clock. Thus, I will turn next to a discussion of three examples from the field of temporal design which, 1. challenge dominant narratives of time, 2. draw attention to alternative temporalities and 3. expose the multiplicity of time (see Pschetz et al. 2016, 6).

The Circadian Clock

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Figure 1 Circadian Clock by Anaïs Moisy ©

One dominant narrative of clock-time is that it consists of twenty four equal hours, divided into two sets of twelve. In the case of *The Circadian Clock* (2015), however, the focus is on the seasonally changing lengths of night and day.³ Created by Edinburgh-based designer Anaïs Moisy, the dial of the clock is engraved with shapes inspired by lace lichen (an important bioindicator of environmental health and a key component of another temporal design – *Wired Wilderness*⁴). The clock has a single hand that fully rotates once during the day and a second time at night. The rate of the rotation changes according to online information about the length of day and night in a particular location. Long summer days are indicated by a slow moving hand, while short winter days cause the hand to speed up. Thus rather than indicating how many modern hours are left in the day, the viewer of this clock can instead read off the relative amount of day or night time left.

³ See http://anaismoisy.com/portfolio/conceptual-design-art/circadian_clock/

⁴ See <https://climateclock.wordpress.com/residency-finalists/wired-wilderness/>

For Moisy the clock particularly challenges the disconnect between clock time and the time of the local environment. However, her work also reminds the viewer of the very different ways that hours were calculated throughout European history. That is, while it might seem like common sense to work with standard hours, in the past variable hours were used as it was more important to be able to tell the time in relation to Sunup or Sundown. In this way *The Circadian Clock* challenges dominant assumptions about how clock-time must operate. Moisy also demonstrates how contemporary designers can remake clocks as part of addressing temporal problems that operate according to different sets of logics.

The Coniferous Clock

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Figure 2 Coniferous Clock by Bril Collective ©

Another temporal design, which in this case draws attention to alternative temporalities, is the *Coniferous Clock* (2014).⁵ In its design all that remains of the traditional clock is the circular shape. Here, rather than mechanical moving parts and a dial, the Japanese design

⁵ <http://www.dezeen.com/2014/09/05/coniferous-clock-bril-cedar-leaves/>

collective Bril have drawn on time-keeping practices linked with the production of *sake* or rice wine. Traditionally, cedar boughs are cut, shaped into balls (*sugidama*), and hung from the eaves of sake breweries. When the leaves turn brown, the *sugidama* signal that the sake had matured enough to drink. In the version by Bril, a circular cedar frame is filled with fresh boughs that brown over the course of about a year. The frame can be refilled to tell time in the next year.

Resonating with Moisy's interest in bio-indicators and environmental time, the *Coniferous Clock* responds to a number of factors including changes in humidity and temperature. Significantly, these are the very factors that mechanical clocks have been designed to be less responsive to. In the case of sake, however, knowing the effects of a combination of environmental conditions may be much more important. As Birth argues in relation to Pittendrigh's discovery that mosquito's coordinate their activities via humidity (rather than hours after sunset), there are always a number of environmental cycles that time can be derived from (Birth, 2017). Thus in the *Coniferous Clock*, the cultural choices around which cycles will be tracked are

drawn attention to and alternative forms of time-keeping take over the form of the clock.

Chronometers for Time Travellers

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Figure 3 Elaine Gan and Nik Hanselmann, "Chronometers for Time Travellers" installed at Digital Arts Research Center, University of California, Santa Cruz, 2011 ©

Finally, an example of a clock that emphasises the multiplicity of time is *Chronometers for Time Travellers* (2011) by artists Elaine Gan and Nik Hanselmann.⁶ The project derives inspiration from Aristotle's definition of time as the measure of change. It consists of four containers that hold water, earth, grains, and air respectively. On top of each container is a display that tells two types of time. The first indicates regular clock time, while the second tells the 'time' of the material. This time is calculated in reference to changes in the material which are captured through a sensor placed inside the box. Gan and Hanselmann describe their work as "push[ing] for a re-thinking of homogeneous, linear time by focusing attention on vibrant materialities and polychronic or differential tempos of change"

⁶ See <http://elainegan.com/riceChrono.html>

(ibid). As I have argued elsewhere (2012), one of the promises of the clock is that, if we follow it correctly, we will be able to coordinate with what is important to us. In *Chronometers for Time Travellers* however, the multiplicity of environmental processes is made visible and the idea that one clock time could encompass them all is put directly into question.

Conclusion

In conclusion, despite the traditional philosophical exclusion of clocks and clock-time from the time of ‘human existence’, this paper argues for an amplification of the principle that time can be told according to a variety of reference phenomena. Drawing on a range of examples from temporal design I have shown how the dominant form of clocks can be brought into question and alternative forms developed. I argue that by opening up clocks ‘to the people’, temporal design offers another future for time-keeping, specifically one that traces a different path from more recognised efforts to advance accuracy and precision. Instead of seeking to insulate clocks from perturbations, temporal design encourages the makers of tools for time-telling – whether they be scientists, designers, or everyday users – to actively address political, cultural and environmental ques-

tions by liberating clocks from the assumption that they can only be correct if they tell the ‘right time’.

Acknowledgments The author wishes to acknowledge support from the UK Arts and Humanities Research Council’s Connected Communities Programme during this work (grant number AH/J006637/1).

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