

# Time (and time again)

Temporality, criticality, and the  
historical imagination: a conversation  
with historian of science LORRAINE DASTON

Interview by ANDREW YANG

DEEP TIME  
C H I C A G O

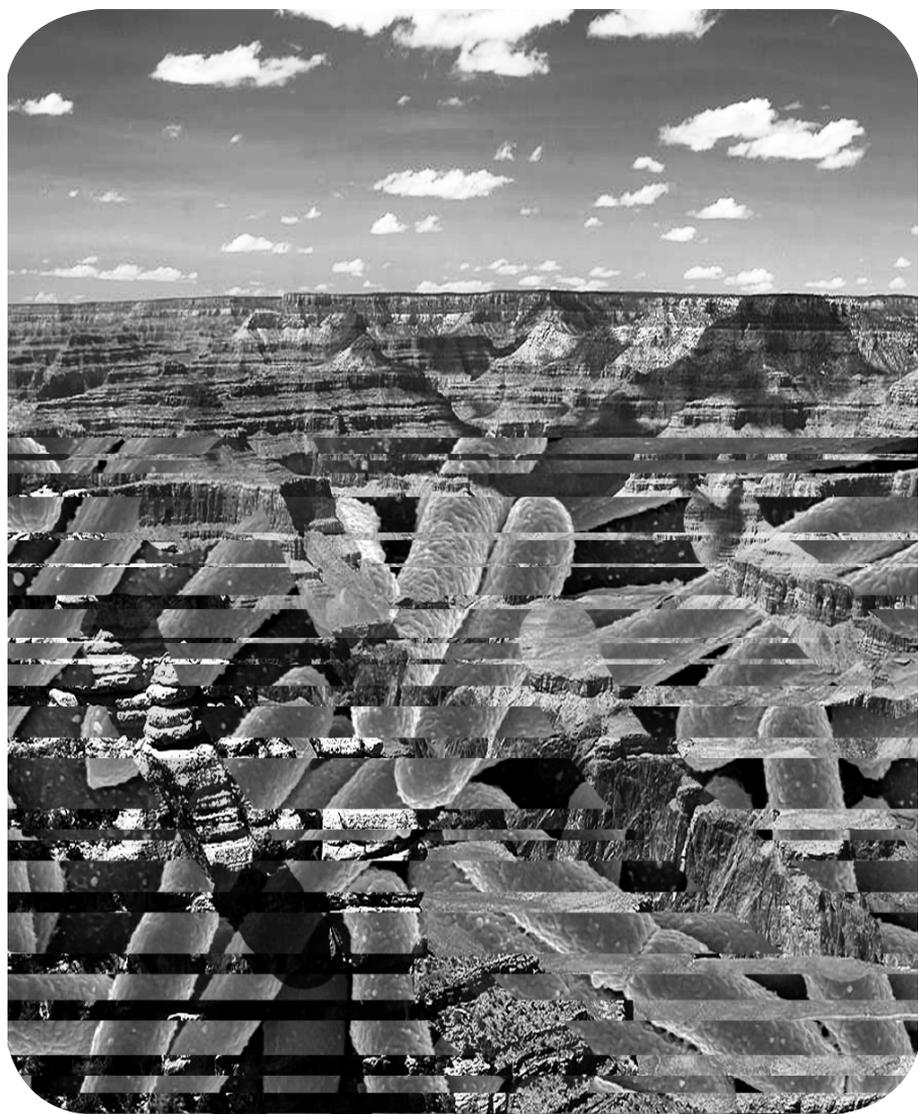
**DEEP TIME CHICAGO** is an art/research/activism initiative formed in the wake of the Anthropocene Curriculum program at HKW in Berlin, Germany. The initiative's goal is to explore one core idea: humanity as a geological agency, capable of disrupting the earth system and inscribing present modes of existence into deep time. By knitting together group readings, guided walks, lectures, panels, screenings, performances, publications and exhibitions, we hope to develop a public research trajectory, offering a variety of formats where Chicago area inhabitants can grapple with the crucial questions of global ecological change.

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five-millennium canon  
transgenerational  
breakneck speed  
hour-by-hour  
election cycle  
acceleration  
quick decay  
longer now  
prestissimo  
continuity  
shelf life  
turnover  
re-scale  
tempi  
fresh  
pace  
now  
eon

(TIME TERMS TAKEN FROM THIS INTERVIEW)



## Introduction

If Earth's whole physical history were fit into a calendar year starting on January 1, then hominids—the category of ape of which *Homo sapiens* is among the latest—only appeared at noon on December 31.<sup>1</sup> We have just happened, and yet biogeophysical data point to the fact that our effects on the planet are now predominant ones. This impact isn't only remarkable because of our species' recency, but more specifically because of its tempo: the pace at which we are collectively reconfiguring the Earth's composition rivals any other force one could imagine, asteroids or earthquakes alike. These changes are wrought on the scale of splitting atoms to splitting ice sheets—they are stratigraphic, metabolic, and genetic all at once. Might it not make sense, then, to posit a new geological epoch called “the Anthropocene,” which designates the mark we've irrevocably inscribed upon the planet for millions of years to come?<sup>2</sup> This is the proposal of geologists today.

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<sup>1</sup> The Earth is approximately 4.5 billion years old. *Homo sapiens*, so-called “modern humans,” emerged around 300,000 years ago and were contemporary with at least two other human species: *Homo neanderthalensis* in Europe (extinct 40,000 years ago and known to have interbred with *H. sapiens*) and (recent evidence suggests) *Homo floresiensis*, which lived on the island of Flores between 60,000-100,000 years ago.

<sup>2</sup> Some of the proposed traces that could definitively mark the Anthropocene epoch (a Global Boundary Stratotype Section or “golden spike”) include: black carbon from fossil fuel combustion, radionucleotides released during atmospheric nuclear testing,

In one sense claiming an Anthropocene seems like the ultimate act of historical self-conceit, our *anthropos* as the measure by which to define a whole new duration of planetary history. The discovery of rocks in locations like the Jura (in Germany) and Cambria (in England) have defined well-known geologic periods like the “Jurassic” and “Cambrian,” while the carbon traces of life in general are namesake of the “Carboniferous” period of 300 million years ago. However, geology eponymous of a single species and its actions is, both literally and figuratively, history making.<sup>3</sup>

At the same time, designating an Anthropocene seems to fundamentally destabilize traditional notions of history and the sense it makes of human agency. By framing the narrative account of our own culture in the nonhuman context of geological deep time we are subsumed: just another fleeting time-being within the expanse of nature’s exceeding history. Historian Dipesh Chakrabarty has reflected on this in terms of imagining an Earth’s future in which humans are absent, claiming it is a thought experiment in which “our usual historical practices for visualizing times, past and future, times inaccessible to us personally—the exercise of historical understanding—are thrown into a deep contradiction and confusion.”<sup>4</sup> However, framing ourselves within the geological past raises its own conceptual and existential questions. This is not only by virtue of that past’s vast and inhuman scales, but also for the sobering tale it tells about the fate that befalls so many species confronted with abrupt environmental change. In that light, starting this paragraph with “at the same time” shifts from an incidental phrasing into the core question that the Anthropocene designation poses: Can the time of “nature” and the time of “culture” now be embraced as one in the *same time*? How will the meaningful merging of natural history and human history be negotiated

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microplastics, nitrogen and phosphate fertilizer traces, and even domesticated chicken bones in landfills, among others.

<sup>3</sup> While the “Ordovician” and “Silurian” periods are namesakes of ancient Celtic tribes (the Ordovices and Silures) that once inhabited the region of Wales where rocks of these strata were first identified, this again is essentially naming by geographic locale, not by the life activity of a species.

<sup>4</sup> Chakrabarty, Dipesh. “The climate of history: Four theses.” *Critical Inquiry* 35, no. 2 (2009): 197-222.

for modern/postmodern/contemporary global societies that have insistently kept nature and culture separate in their economic and philosophic imaginaries? This time, same time, deep time... no time like the present.

I was lucky to have the opportunity to talk with one of the pre-eminent historians of science and European intellectual history, Professor Lorraine Daston, about the scientific, political, and historical dimensions of the Anthropocene proposal, as well as the stakes for historical scholarship in a period of climatic and climatic change. The following interview took place in Daston's office at the University of Chicago in March of 2017.

*"We need an analogous suppleness  
for timescale, from the  
nanosecond to the eon and  
everything in between."*

**AY:** As an historical claim, the Anthropocene has been critiqued by some as putting too much emphasis on the human—if not by overstating our geophysical impact, as global warming denialists would have it, then by simply perpetuating a (self-) importance of humans relative to the rest of the Earth. However, for many the Anthropocene is also foreboding because of its implicit suggestion that humanity could write itself out of the planetary narrative through anthropogenic climatic and ecological changes. Is the presence of the human, and the continuity of human culture, a necessity in history-writing in general or in the history of science more specifically?

**LD:** Insofar as one is actually a historian of science, I do think an anthropocentric point of view is essential. There is a difference between doing the history of science, a human endeavor, and science, the study of nature. I can, however, well imagine different timescales for different kinds of history. At some point, environmental history might blur into what we call geology or evolutionary biology, or even certain forms of astronomy in which one imagines an extended timeframe in which human beings at some point appear, but are by no means center stage. I think that would be a legitimate and also mind-expanding form of history. That being said, I do think that there are forms of history which helpfully displace human beings from the focus of history. I am thinking concretely about climate history as it intersects with the history that is otherwise quite familiar to us. There are now medievalists, for example, looking at outbreaks of the bubonic plague in various parts of the world in the 14<sup>th</sup> century and trying to understand how climate conditions might have increased susceptibility or resistance to such new diseases.

In that telling, it is no longer only a history of the decimation of population, the rise in wages as a result of that decimation, the stimulus given to a certain form of mercantile capitalism, or to religious reform; it's a story in which those events are, to some extent, corollaries of a much larger phenomenon of world weather patterns, the dissemination of bacteria, the vectors for those bacteria, the mutations of those bacteria, the dispersion of rats, etc. Of course, we historians would not be interested in those bacteria had they not wiped out at least one-tenth of the European population after 1348. Nonetheless it is a much-enlarged history, with non-human actors playing a very important role in the history. That kind of history I can easily imagine.

More narrowly within the history of science, I can imagine the explosion of Krakatoa or the late 18<sup>th</sup> century eruption of a volcano in Iceland giving stimulus to scientific inquiry in a particular direction that it otherwise might not have taken. Just as our current concern with climate change is at once the product of scientific inquiry and a stimulus to further scientific inquiry, I can imagine those factors weaving together to create a different kind of tapestry of history in which human beings are only part of a larger, more complex pattern. That tangled causal nexus would be an order of magnitude more complex than most history is accustomed to dealing with—but that is not a bad thing, just a welcome challenge thrown down to us.

**AY:** So, humans become one of many factors in a sort of “ecology” of historical unfolding? Or do humans as the instigators of current climate change, for example, still hold a privileged position?

**LD:** I think no matter how you frame it, it is going to imply a diminution of human agency. If you were to frame it traditionally, that is in terms of the opposition “nature versus humans,” you indeed might have a story with the following plotline: Until 1800, nature loomed dominant and titanic, with humans at the mercy of forces beyond their control.<sup>5</sup> Then, especially as

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<sup>5</sup> Although innovations in mining, metallurgy, textiles, and steam power had been developing for at least one-hundred years prior, the rates of extraction, consumption, and production markedly increase across number of these sector around 1800 in Northern Europe and North America. Meanwhile, specific inventions, such as Henry Maudsley's screw-cutting lathe in 1800, profoundly transformed industrialization by allowing for the emergence of standard tooling sizes and interchangeable mechanical parts.

a consequence of the Industrial Revolution, the roles were reversed, and nature no longer figures as the cruel stepmother as it were, powerful and often brutal, but is now re-imagined as the ward of human beings. That is one way of framing it.

Another way of thinking about it, which I think is more useful and more faithful to reality, is that there is no such thing as a monolithic nature. We might instead imagine, in a much more differentiated way, a variety of actors acting on the scales of generations, centuries, even millennia, zooming in and out of the timescales of the bacterium responsible for the bubonic plague, to those of the weather cycles responsible for the Little Ice Age of the late 17<sup>th</sup> and early 18<sup>th</sup> century.<sup>6</sup> That nimbleness of being able to adjust to different timescales would give us a very different idea of agency. It's not impossible to imagine such enlarged timescales—the most remarkable architecture all over the world is the product of the commitment of human cultures to transgenerational, trans-century projects. Humans are capable of that kind of agency. What are the preconditions of that kind of agency? Probably not an election cycle of four years.

**AY:** The complexity of historical causation and the multiple timescales its different causal actors inhabit seem to go hand in hand. By reframing the depth of our historical time into geological time, I wonder if the Anthropocene can helpfully re-scale perspective for contemporary humans. The current generation in political power doesn't seem to recognize the transgenerational stakes in something like human-induced global warming, biodiversity, or pollution. Our sense of the past and the future seems very shallow, as are our decisions with respect to them. Is there value in incorporating more of the past and the future into a "longer now"?<sup>7</sup> For

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<sup>6</sup> The Little Ice Age was a general period of cooling in Europe and North America between 1300 to the mid-1800s. Though not technically cold enough to be considered a true ice age, winters became noticeably colder with an increase in storms, floods, and crop failures, lower fishing yields, and the expansion of sea ice that closed northern trading ports. Its coldest period was between about 1645 and 1715. Accessed from: <https://www.eh-resources.org/little-ice-age>.

<sup>7</sup> The idea of a "long now" was coined by Brian Eno. As the "The Long Now Foundation" describes it: "Upon moving to New York City, Brian found that 'here' and 'now' meant 'this room' and 'this five minutes' as opposed to the larger here and longer now that he

example, I sometimes feel like I share a culture with people who lived in the 1600 or 1700s by virtue of having inherited their ideas about knowledge or freedom, for better and for worse. Would it be meaningful to call the people of 400 years ago my contemporaries?

**LD:** There is a context in which it would be meaningful. There are institutions, some religious and others scientific, that do conceive of their community as a community that necessarily spans not just generations, but millennia. NASA's five-millennium canon of lunar and solar eclipses draws from observations as far back as those of ancient Mesopotamia. When the astronomers of the late 19<sup>th</sup> century decided to take a snapshot of the whole sky using the then-new tool of astrophotography, they envisioned the result as their legacy to astronomers in the year 3000 CE. Astronomy isn't the only science that depends on preserving an archive that connects present research to the far past and projects its community into the far future. There is always a utopian element to these disciplinary projects. Think of the year 3000 CE, as remote from us as the Song Dynasty in China, the Abbasid Caliphate, and the Christianization of Northern and Eastern Europe. Civilizations will rise, civilizations will fall, but there will always be astronomers, or at least that's the wager implied by such long-term projects. That archival sensibility and the utopian vision that underpins it are not unusual among scientists, including practitioners of the human sciences. Most obviously, historians are always concerned with the creation and preservation of archival materials, laying in stores for their successors.

One reason why archive fever and archive anxiety prevail at the moment is that we are in the midst of a media revolution, and every media revolution forces us to tread a tightrope between preserving the old materials as well as the retrieval techniques and classification systems that made them usable, and at the same time taking advantage of the possibilities of new technology. This happened with the print revolution, and it is happening now with the digital revolution, but both revolutions ultimately help make continuity possible.

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was used to in England. We have since adopted the term as the title of our foundation as we try to stretch out what people consider as now." Accessed from: <http://longnow.org/about>.

**AY:** It is no longer a matter of scrambling as hard as you can to preserve traces, now it's about the pressure to decide what exactly to throw away as a means of prioritizing what to keep.

**LD:** Yes, we are drowning in materials. I've read articles by archivists suggesting that we just randomly sample what we have now, on the view that since we have no idea what might interest historians 200 or 500 years hence, all we can do is to leave them a random, statistically representative sampling of what our culture was.

**AY:** Sampling the past for something meaningful for the future... I recently heard a talk by historian Julia Adeney Thomas called "Finding Ecologies of Hope in Japan: The Historian's Task in the Age of the Anthropocene," in which she discussed Tokugawa Japan and how, despite being shut off from global trade for almost two hundred years, the country was remarkably self-sustaining.<sup>8</sup> She argued this was possible not only because of political and economic structures, but also because of the way that cultural practices around farming, domestic life, and even clothing created a culture of sustainability rather than growth. The closed system of Tokugawa Japan was a kind of "alternative history" for early modern development, and perhaps even for the closed system of the Earth's biosphere.

Thomas makes a case for "critical history" that explores past histories as an imaginative model for thinking about our future choices. This idea seemed kindred to something you said in a previous conversation about the power of the historical imagination as a "reconstruction of another time and place for imagining how things could be different now." However, you also connected that historical imagination to utopian thinking and how current politics perhaps lacks the "utopian moment." Could say more about that conception of historical imagination and utopian thinking in light of Thomas' notion of critical history?

**LD:** I am very sympathetic to the impulse that animates her approach. I do think what we can learn from the most are those cases in which once-utopian ideas became part of the everyday. Not past utopian projects that

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<sup>8</sup> Julia Adeney Thomas' works include: *Reconfiguring Modernity: Concepts of Nature in Japanese Political Ideology* (University of California Press, 2001) and *Japan at Nature's Edge: The Environmental Context of a Global Power* (University of Hawai'i Press, 2013).

remained utopian projects, like the Bauhaus settlement of the 1920s or the Shakers of the 19<sup>th</sup> century, but rather something like universal adult suffrage. Universal suffrage was once a utopian idea that required centuries of philosophical argument and political hard work before it became self-evident, an everyday reality. That is the kind of history we need to pay attention to—not just the inspiration that things could be otherwise, but the conviction and stamina to make them otherwise, and to make them permanently otherwise. What history provides is an existence proof that the struggle can be successful. And such encouragement can, I think, only be provided by history. It is only the empirical proof of the outcomes of such struggles, including the failures, that can be inspiring and instructive.

**AY:** And by instructive do you mean as a model, as an analogy, or just by means of inspiration?

**LD:** I think the instruction can only be by analogy. “Model” suggests more of a one-to-one mapping, which I believe would always be disrupted. Consider the case of how Anglo-American law uses analogy in creating a chain of legal precedents. The cases of the past are never really models for, much less identical to, the cases that confront us today. The skillful mustering of past precedents is an exercise in extended, judicious analogy: not arbitrary analogy, not reason let off the rails, but deliberative analogy. We need similar instruction from history. Insofar as we may think of history as a museum of cultural experiments, which ones have worked, and to what extent, and how could we translate those experiments to the here and now?

A concrete example is the work of historians on same-sex unions in the Byzantine Christian church.<sup>9</sup> The argument was not that there were striking similarities between the culture of late 20<sup>th</sup>-century America and 9<sup>th</sup> century Byzantium, rather that “this happened once, it could happen again.” And not only did it happen once, it happened in a way that did not rend the entire fabric of society: creative ways were found to ease this novelty into existing structures. We are no less inventive than they were, we can do it again. Such historical research plays a crucial role in expanding the imagination for the possible.

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<sup>9</sup> Boswell, John. *Same-sex Unions in Pre-modern Europe* (Vintage, 2013 [1994]).

**AY:** Do you think there is any special task for historians now as opposed to any other time in history, or perhaps all historians see their own historical moment as special?

**LD:** It's a necessary illusion to think that our work is urgent! But if I were to try to sharpen the focus on why it is urgent right now that we do our work, and do it well, it would be just to figure out how we got to where we are. And this returns us to the Anthropocene. One reason that the Anthropocene has been controversial is not necessarily because there are climate change deniers; rather it's that many people feel the Anthropocene naturalizes developments that are in fact historical, for example the growth of a certain kind of resource-intensive capitalism, and also of geopolitical disparities in the use of resources, disparities that require an explanation in order to right the balance. Without understanding how we got to our present predicament, the step-by-step mechanics, it is not clear how we could change the processes at work. That is one reason why history at the moment is urgent.

**AY:** What your view on the pros and cons of the "Anthropocene"? One issue is that there are so many ways that it is being used.

**LD:** To my mind, the strongest "pro" remains its power as a rallying cry to galvanize political will around climate change. As for its scientific merit, I think the jury is still out, in part because scientists themselves can't agree on which criteria merit the proclamation of a new geological epoch, or its starting date. Even if it is settled by convention, the question persists: will it be a fruitful convention? Is it a foundation upon which future research can be built? Does it suggest new questions?

**AY:** You mentioned political cycles and the urgency of history of this time. You've written a lot about the history of empiricism and more specifically of "facts." What do you make of the current political and media climate around "alternative facts" or "post-truth" culture?

**LD:** The term "fact" is so fundamental that if you suggest it has a history you seem to be suggesting that reality itself has a history—but that is not what I am saying. There have always been elements of obdurate experience that cannot be changed at will.<sup>10</sup> The historical achievement of the 16<sup>th</sup> and 17<sup>th</sup>

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<sup>10</sup> Other writings on facts by Daston include "Marvelous facts and miraculous evidence in early modern Europe" in *Critical Inquiry* 18, 1 (1991): 93-124, and "Hard Facts" from

“Insofar as we may think of history as a museum of cultural experiments, which ones have worked, and to what extent, and how could we translate those experiments to the here and now?”

century discussion about what came to be called “matters of fact” is the theorization of the separation of what is the case from the interpretation of the case, and the strenuous effort—never fully perfected but useful even if only imperfectly approximated—to keep fact and interpretation asunder.

History can also reassure us that we’ve been here before. During the last media revolution, when printing was introduced in early modern Europe, similar problems arose: wild rumor and fantastical stories were disseminated by cheap broadsheets, usually illustrated, just as spectacularly and dangerously as the latest, sensationalist website, complete with horrific images (in the print case, woodcuts) intended to whip up anger, outrage, and fear. It took about one hundred to one hundred and fifty years for the medium to settle down and start to regulate itself—to create conventions and watchdogs, rules both explicit and implicit for authors, publishers, and governments.

I think that knowing this earlier history can help to accelerate this process. In my opinion, one step in that direction would be to declare the Internet a public utility and to regulate it as such. Despite the free market rhetoric of many Internet visionaries, there are many precedents for the regulation of new media in the public interest. It happened with radio and television as well—whenever there is a new mode of mass communication, the same

manipulative possibilities light up eyes with the same phantasmagoric glow and propagate themselves. I am therefore not surprised that this is happening once again in the Internet age, but that is not to say that I don't think it's dangerous and that we don't have to combat it. Once again, as in the case of the fact, such conventions and regulations are hard-won historical achievements, consisting not just in the conceptual distinction between fact and interpretation, but also in all of the institutions—for example, professional journalism—that have grown up to enforce the conceptual distinction through their practices. Both practices and institutions must be protected and strengthened.

**AY:** Criticality—that is, the process of the interpretation of facts—requires a certain amount of time and perhaps a pacing. We had a conversation eighteen months ago that seemed engaging and rich, but in reading its transcript now, already felt out of date to us both. I wonder if that is symptomatic of something that is contributing to the erosion of thoughtful critique. If we have a conversation about history's role in the contemporary moment but it only has a shelf life of a year and a half, what does that say about the pace at which we are having to consider and interpret, reconsider and reinterpret?

For academics and so-called cultural creators, the demand to always be in high production creates a frenetic level of informational turnover. There seems to be a real contradiction: we are producing more and more of these in-depth accounts of the world, but we also have much less time to truly take them in before we have to move on to the next thing. I am wondering not only about the relationship of past and present to the future, but also the pacing necessary for a critical approach to facts—whether that possibility is getting overrun with the acceleration of information.

**LD:** I do share that sense of breathlessness, but I also know as a historian that the experience of panting to keep up is at least as old as 1848, when the *Communist Manifesto* proclaimed the acceleration of time: "All that is solid melts into air, all that is holy is profaned."<sup>11</sup>

Once again, we should think about the importance of simultaneously having different scales of time. One reason why our conversation of eighteen

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<sup>11</sup> Marx, Karl, Friedrich Engels, and Samuel Moore. *The Communist Manifesto* (New York: Labor News Company, 1959 [1848], vol. 6008).

months ago seems stale is that so much of it was oriented toward a particular moment, a particular political moment and a particular scientific moment. Science and politics are both endeavors moving at *prestissimo* pace, from day to day, even hour to hour. The engines of academic publications can be stoked to move at breakneck speeds, but it is not clear to me that this would best serve scholarship. One of the great contributions that scholarship can make, and one that distinguishes it from journalism, is to reflect, not just to report and react.

And I agree with you that reflection requires time as well as a sense of how time changes situations and perspectives: our shared perception that our previous conversation was now outdated—as perhaps this one will be in a year's time. Then comes the next level of reflection: Why had our conversation aged? Why do the terms we used then no longer have traction now? What would it take to coin categories immune to such quick decay? How far must we abstract ourselves from the flotsam and jetsam of the morning news in order to achieve that level of reflection, and how far out is too far out, where nothing much matters any more? Those are ongoing questions that will never be definitively solved, but they will be better or worse solved. We will always be trying out different timescales and tempi. That agility in shifting perspectives is valuable in itself, because it teaches how diverse perspectives can complement and correct one another.

**AY:** And so, to exist in multiple temporalities.

**LD:** Yes, and this is perhaps the greatest single achievement of the project of critique known as the Enlightenment. Over centuries we've schooled ourselves in taking multiple perspectives through criticism and self-criticism. If the training takes, we are intellectually supple, trained not only by analytical argumentation but also by imaginative literature and films to envision the world with different eyes. We need an analogous suppleness for timescales, from the nanosecond to the eon and everything in between.

**Lorraine Daston** is director at the Max Planck Institute for the History of Science in Berlin and visiting professor in the Committee of Social Thought at the University of Chicago. Daston is a scholar of early modern European intellectual history and the author of numerous works within the history of science, including her books *Wonders and the Order of Nature, 1150-1750* (with Katharine Park, 1998), *Objectivity* (with Peter Galison, 2007), and *How Reason Almost Lost Its Mind: The Strange Career of Cold War Rationality* (with Paul Erikson et al., 2014). Daston is the recipient of the Pfizer Prize and Sarton Medal of the History of Science Society, among others. Her current projects include the history of rules, the sciences of the archives in the 19th century, the relationship between moral and natural orders, as well as the classification of clouds.

**Andrew Yang** is a transdisciplinary artist, scholar, and currently Associate Professor at the School of the Art Institute of Chicago, as well as research associate at the Field Museum of Natural History. His work has been exhibited from Oklahoma to Yokohama, Chicago to Kassel, while his writing and research appear in journals spanning biology, art, and philosophy, including *Biological Theory*, *Gastronomica*, *Leonardo*, and *Interdisciplinary Studies in the Philosophy of Science*. He was a visiting scholar at the Max Planck Institute for the History of Science in 2015.

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"They always say time changes  
things, but you actually have to  
change them yourself"

-ANDY WARHOL

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