

SPECIAL ISSUE

# History, Scientific Ignorance, and the Anthropocene

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This essay reflects on the ways in which the notions of scientific ignorance and the Anthropocene bear upon the development of the history of knowledge, asking what it might mean for the field to make an "ignorance" and "anthropocenic" turn. The central argument is that these turns suggest that the history of knowledge is and should strive to be more than an expansion of the history of science, instead taking up some of the epistemic challenges of the 21st-century of which scientific knowledge is just one part.

This article is part of a special issue entitled "Histories of Ignorance," edited by Lukas M. Verburgt and Peter Burke.

**Keywords:** history of knowledge; scientific ignorance; Anthropocene; historiography; agnotology

## The History of Science, The History of Knowledge, and the History of Ignorance

The new field of history of knowledge has gained increasing attention in recent years for its study of what has been perceived as knowledge in the past. Among other things, it has shown how hierarchies of knowledge have been established and overturned, how some knowers have been included while others have been excluded, and how knowledge has travelled around the world and has been transformed in the process of movement, translation, and transmission. As in other fields—sociology, anthropology, economics, and geography—the concept of "knowledge" has come to serve as an umbrella term that has proved both "suitably vague" and "sufficiently interesting" to bring together scholars with different backgrounds and interests and studying different periods, sources, and phenomena.<sup>1</sup>

The rapid flourishing of the history of knowledge has given rise to a host of questions: What *is* and what *isn't* the history of knowledge? What is this thing called *knowledge* whose history is studied? What does it allow historians to do that fields like the history of science, the history of the book, and intellectual, social, and cultural history do not? It has been observed more than once that the concept of knowledge, in and by itself, is too "baggy" to give coherence and autonomy to the field.<sup>2</sup> Some acquiesce to the situation, accepting conceptual flexibility as a disciplinary strength.<sup>3</sup> Others, more keen on clear-cut concepts, have either defined knowledge historically, put forward a wider notion of what knowledge is, or looked for an alternative systematization of epistemic matters, such as systems, hierarchies, patterns or architectures, that might provide a framework for the many kinds of knowledges brought into focus in historical research.<sup>4</sup> Still others have already begun to caution against jumping on the bandwagon of the fashionable "knowledge boom," instead defending the continuing significance of both the subject matter and research methods of more traditional fields.<sup>5</sup>

<sup>1</sup> Östling et al., *Forms of Knowledge*, 10.

<sup>2</sup> For discussion of this topic, see the exchange between Martin Mulrow and Lorraine Daston in Mulrow and Daston, "History of Knowledge" and the contributions to the first issue of the *Journal for the History of Knowledge*.

<sup>3</sup> The three editors of the 2020 *Forms of Knowledge*, for example, adhere to the idea that adopting vague definitions of knowledge is more fruitful than pursuing conceptual rigor.

<sup>4</sup> Cf. Lässig, "History of Knowledge"; Mulrow, "History of Knowledge"; and Daston, "History of Knowledge."

<sup>5</sup> See, for example, Renn, "The Anthropocene" for this point.

One of the central questions, in this regard—though by no means the only one, as scholars coming from intellectual history and the history of humanities, for instance, have shown—concerns the history of knowledge's relation to the history of science, which has been used variously to downplay or highlight the newness of the field.<sup>6</sup> On the one hand, the history of knowledge has been observed to be the outcome of developments that the discipline of the history of science has undergone since the 1960s–70s, namely the historicization and broadening of the chronology and geography of the category of “science.” On the other hand, it has also been said that the history of knowledge breaks with, or is at least different from, the history of science, as it emerged from and includes topics that fall outside or sit uncomfortably with the older discipline's scope. Taken together, it is clear that the history of knowledge isn't the history of science—and it is clear why this is or perhaps should be so—but it is unclear, and contested, in what sense. Indeed, despite their friendly disagreements, both parties would likely accept that it is important to find out what a more free-standing history of knowledge—which would include as a special case or form a background to the history of science—might look like.

### Towards a New (Grand) Narrative

The present consensus seems to be that, in order to pursue this project, the history of knowledge needs a new grand narrative about itself, one that can help shape its own what, how, and why. Firstly, because it currently still tends to define itself negatively, as covering that which the history of science does not cover. Secondly, because a history of knowledge that is more free-standing, with ambitions of its own, should not be free-floating: It should know what it is, what it is not, and why it exists.

One option that creates common ground between historians of science and of knowledge is to develop a framework “binding together the different approaches to the history of science.”<sup>7</sup> In this scenario, the history of knowledge would offer a response to the “fragmentation” and “loss of direction” that the history of science has experienced due to its own broadening of scope.<sup>8</sup> More specifically, it would take up anew older questions still facing the history of science, such as those concerning the “universalizing role” and “common cultural characteristics” of science across the globe.<sup>9</sup> “Even if we jettison the truisms by which they were traditionally answered,” Jan Golinski wrote a few years ago, “these questions remain fundamental” and the challenge is “to derive new ways to respond.”<sup>10</sup>

Another option for the history of knowledge is to emancipate itself from the history of science altogether, looking to other disciplines for inspiration.<sup>11</sup> It has been argued recently that the history of knowledge should have such a greater ambition precisely in response to the internal and external challenges facing the history of science. These *internal* challenges concern the fact that the history of science has been shown—not least by the history of knowledge itself—to reflect a normative set of assumptions about what science is. Among these meta-scientific beliefs are not only the views of science as both “modern” and “Western” but also such major claims as that it is the foremost producer of, and constitutes the only path to, knowledge. Holding onto such claims is understandable at a time when scientific expertise is undermined from different sides for political purposes. And given its central and important role in today's world it would surely be a mistake to simply “forget science” as an object of study. But it is nonetheless legitimate to ask whether the history of science's “science” still offers the best starting point for a picture of knowledge in today's world where science is just the tip of an epistemic iceberg. The re-definition of the historical study of knowledge in the twenty-first century, indeed, urges us to ask new questions about the boundaries, hierarchies, and mutual constitution of different types of knowledge as well as “non-knowledge,” including doubt, failure, and ignorance.<sup>12</sup> It is precisely for this reason that a workable version of the history of knowledge, one which does more than merely expand the history of science, which it includes as a special case, is “probably indispensable.”<sup>13</sup> But is also for this reason that the history of knowledge should be more than a history of knowledge (*epistēmē*), that is, also a history of ignorance (*agnōsis*).<sup>14</sup> It is no longer just science or knowledge,

<sup>6</sup> Cf. Daston, “History of Knowledge”; and Dupré and Somsen, “History of Knowledge.” See Marchand, “How Much Knowledge” for a discussion of history of knowledge from the perspective of intellectual history.

<sup>7</sup> Renn, “The Anthropocene,” 38.

<sup>8</sup> Secord, “Knowledge in Transit,” 654.

<sup>9</sup> Renn, “History of Science,” 38. See also Dear, “Science is Dead.”

<sup>10</sup> Golinski, “Singular Science,” 35.

<sup>11</sup> This position has been defended in Burke, “Response”; Dupré and Somsen, “History of Knowledge”; and Verburgt, “History of Knowledge.” See Zwierlein, “Introduction,” section 1, for a brief discussion of the dangers of building on present-day disciplines.

<sup>12</sup> See Dupré and Somsen, “History of Knowledge.”

<sup>13</sup> Daston, “History of Knowledge,” 145.

<sup>14</sup> This argument is developed in Verburgt, “History of Knowledge” along theoretical lines.

but the whole of humanity's epistemic interactions with the world, far beyond modern, Western scientific knowledge, that are in need of historicization. What counts as a failed or illegitimate contribution to knowledge? What kinds of ignorance are there? The history of knowledge should historicize such questions and ask why particular answers have been given in particular places at particular times.

Besides the internal challenges to the history of science, there are the *external* challenges of the new questions and the new demands of present-day society, and the modalities—the ways of relating to the past, present and future—specific to our current historical condition. It is well known that the discipline of the history of science was never established, and did not develop, in a vacuum. From its official start in the 1940s through the course of the twentieth century, it was supported, because it seemed valuable for specific purposes and seemed to offer insights relevant to issues of the time.<sup>15</sup> During this period, the history of science evolved roughly from “*belle époque* positivism via post-war scientism to Cold War modernism [and] 1970s relativism”—always in response to societal circumstances.<sup>16</sup> A lot has happened since the 1970s—think only of what inspired the practice, gender, global, and postcolonial turns—and today we live in different times again.

The concept of the Anthropocene has emerged as one of the most powerful ways of understanding the meaning our twenty-first-century present and debating the possibilities for the future. What many scholars are showing, and what any newspaper reader will confirm, is that, alongside capitalism, injustice, and inequality, the planet itself is emerging as a matter of broad human concern. As Dipesh Chakrabarty writes: “The current pandemic, the rise of authoritarian, racist, and xenophobic regimes across the globe, and discussions of renewable energy, fossil fuel, climate change, extreme weather events, water shortage, loss of biodiversity [...] all sign to us, however vaguely, that something is amiss with our planet and that this may have to do with human actions.”<sup>17</sup> Importantly, the Anthropocene, as well as the attempt to face and cope with it, is not only a political, economic, and social challenge, it is also an epistemic one.<sup>18</sup> On one level, it raises key questions about the central role of science and technology in the transition from the Holocene to the Anthropocene. On another level, it asks what kind of knowledge must be produced in order to make sense of this new geological era as well as to take the actions needed to avoid future catastrophe. Both levels are closely related: For instance, research into techno-science as one of the driving forces behind the Anthropocene highlights the significance of actionable knowledges of a different kind, such as traditional or indigenous.<sup>19</sup>

The Anthropocene is arguably one of the, if not the central most important change in our present—even of our very sense of time—that should prompt the historian to look at the past, and to position herself towards the future, in new ways. Given the centrality of (the limits of) knowledge, this holds perhaps especially for the historian of knowledge, for whom it provides a “sweeping and memorable” narrative in terms of which to lend a sense of urgency and timeliness to its study of historical knowledges and its problematizing of the originary narrative of the history of science.<sup>20</sup> All historians of knowledge are therefore well-advised to ask themselves: Why are we doing the history of knowledge? What “regime of historicity” does it respond to or invoke? Are we pursuing it purely for the sake of knowledge or do we have other, emancipatory motives in relation to present-day challenges? Could the Anthropocene be such a challenge? If so, should we place it in a long-term perspective or should we produce other kinds of historical knowledge instrumental to dealing and coping with it, or even to imagining different “historical futures?”<sup>21</sup> If so, what (kind of) historical knowledge has most pertinence today, and what should be the historian's task?

The point of this programmatic essay is to argue that the history of knowledge, in its soul-searching attempt to establish itself, should not focus on conceptual analysis of its subject matter. Instead, like the history of science did in the twentieth century, it should be pursued in deliberate response to the current concerns in the twenty-first century. The paper also suggests that one fruitful possibility, in this regard, is to focus on, and define itself in terms of, the new epistemic challenges to humanity to which the Anthropocene concept draws our attention. One of these concerns is that of scientific ignorance, a

<sup>15</sup> The history of the history of science is yet to be written, but important parts of the story are told in Dauben et al., “Seven Decades”; Dear, “History of Science?”; and Poskett, “Science in History.”

<sup>16</sup> Dupré and Somsen, “History of Knowledge,” 188.

<sup>17</sup> Chakrabarty, *Climate of History*, 1.

<sup>18</sup> See Renn, “Evolution of Knowledge,” 6.

<sup>19</sup> See, for example, Whyte, “Indigenous Climate Change Studies.”

<sup>20</sup> Daston, “History of Knowledge,” 146.

<sup>21</sup> See Simon and Tamm, “Historical Futures.” On the “construction of the future” see also, for instance, Nelson, *The Time of Enlightenment*.

specific kind of ignorance, strongly related to the notion of epistemic hierarchies, which has received much of attention of late.<sup>22</sup> Many long-held modernist assumptions, also found in the history of science, have been toppled by the Anthropocene concept, including the divisions between nature and culture, the geological and the human, and the notion of progress. Doing history under conditions of the Anthropocene asks for a further step: to give up the idea of knowledge and ignorance as opposites, the idea that ignorance is merely the lack or absence of knowledge. The paper concludes with a brief cautionary proviso, touching on some of the historiographical problems facing any “anthropocenic” history.

## History and the Anthropocene

Since the year 2000, the Anthropocene concept has moved to the center stage in the humanities. It has been taken up in several disciplines, where it has developed into a rapidly growing and controversial inter-, cross-, and trans-disciplinary object of research, it has given rise to entirely new fields (the environmental humanities), it has been used as an opportunity to rethink modernist beliefs and to criticize post-modern fashions (historicism, relativism), it is variously embraced as the grand narrative for the twenty-first century and rejected in favor of other large (or deliberately smaller) narratives (the Capitalocene or the Chthulucene), and it is seized upon to stimulate collaborations with the arts and the sciences.<sup>23</sup> Within the so-called “anthropocenic turn,” the discipline of history occupies a special place: perhaps first and foremost because not only the Anthropocene’s history itself is actively debated but also who gets to write it.<sup>24</sup> First of all, a quick look at the historical sources shows that the idea that the face of the Earth is fundamentally transformed through human activities is nothing new. The article by Paul J. Crutzen and Eugene F. Stoermer that started the recent popularization of the term Anthropocene included a list of “precursors” of the concept, ranging from Comte de Buffon to Vladimir Vernadsky. A new group at the MPIWG, Berlin, has dedicated itself to documenting a proper history of “Anthropocene thinking.”<sup>25</sup>

Secondly, the official scientific acceptance of the notion of the Anthropocene as a new geological epoch depends on arguments about its start date in the Earth’s history.<sup>26</sup> Indeed, next to the geological record, interpretation of human history plays a crucial role in dating the Anthropocene. The natural sciences and the humanities have different understandings of how and when human activities started to actively influence the Earth system, with geologists focusing primarily on parameters for which stratigraphic data exists and historians also including moral-political concerns. Both among historians and among geologists in the Anthropocene Working Group (AWG) who believe that the causes of Earth’s transition are human and social and that the official category should be useful well beyond natural science, there have been calls to include the humanities in the formalization of the Anthropocene.<sup>27</sup>

Thirdly, despite the criticism, the role of the humanities and perhaps especially that of historians in the Anthropocene debate arguably hints at a profound shift in the definition of geological time periods.<sup>28</sup> Fourthly, a clear sign that calls for transdisciplinarity—that is, for the inclusion of the humanities into the core agendas of scientific environmental research—are taken seriously, science-based projects are being established that attempt to bridge the “two cultures.” Taking the lead in these endeavors is Integrated History and Future Of People on Earth (IHOPE), originally a project of the International Geosphere and Biosphere Programme, whose aim is to show that in the Anthropocene “global history has become the business of more than just historians.”<sup>29</sup> Other, humanities-based projects joining in this spirit of collaboration are

<sup>22</sup> See, for instance, the essays in Kourany and Carrier, *Ignorance*.

<sup>23</sup> It was in the year 2000 that Paul J. Crutzen and Eugene F. Stoermer popularized the term Anthropocene. Crutzen and Stoermer, “The Anthropocene”. On the Anthropocene and the (environmental) humanities see Merchant, *Anthropocene and Humanities*, and Oppermann and Iovino, *Environmental Humanities*. For a defense of the Anthropocene as a key concept in the humanities see Trischler, “The Anthropocene.” For arguments in favor of speaking of the “Capitalocene” see Moore, *Anthropocene or Capitalocene?* For the notion of the Chthulucene see Haraway, *Trouble*.

<sup>24</sup> For the notion of the “anthropocenic turn” see Dürbeck and Hüpkes, *Anthropocenic Turn*.

<sup>25</sup> The research project “Historical Sources and Contexts of Anthropocene Thinking” is part of the research theme (2017–) “Knowledge in and of the Anthropocene.” See Rispoli, “Genealogies of Earth System Thinking,” for an interesting first contribution.

<sup>26</sup> An example is furnished by the 2015–2019 discussion in the pages of *Science* and *Progress in Physical Geography* between William Ruddiman, Jan Zalasiewicz and Matt Edgeworth about the AWG’s proposal to choose a formal start date for the Anthropocene at or after 1950. See, in this regard, for instance Zalasiewicz, “Making the Case for a Formal Anthropocene Epoch.”

<sup>27</sup> See Ellis et al., “Involve Social Scientists.” See, for instance, Toivanen et al., “The Many Anthropocenes,” for a discussion of the “transdisciplinary challenge” for Anthropocene research.

<sup>28</sup> See Nichols and Gogineni, “The Anthropocene’s Dating Problem.”

<sup>29</sup> Robin and Steffen, “History for the Anthropocene,” 1694.

the Rivers of the Anthropocene Network at the IUPUI Arts & Humanities Institute in Indianapolis and the Anthropocene Curriculum, initiated in 2013 in Berlin.<sup>30</sup>

All the aspects discussed so far relate to history *of* and *for* the Anthropocene. These essentially concern the questions “When did the Anthropocene begin?” and “What history is needed to understand the Anthropocene?” Both the *of* and the *for* show the centrality of history to the Anthropocene as much as they turn history itself into an object of both theoretical, political and disciplinary contestation. As the authors of *The Shock of the Anthropocene* argue, dating the Anthropocene always involves specific views on why to establish and how to identify it as well as on who is responsible for and how best to deal with it.<sup>31</sup> For instance, the alleged rush to confirm the 1950s as the start date of the Anthropocene has been observed to downplay the fact that the capacity of human societies to transform the Earth system is social, cultural, and economic and not merely physical, chemical or biological.<sup>32</sup> And this neglect—predominantly by natural scientists—opens the door to a naïve, and de-politicizing, faith in scientific expertise and technological fixes.<sup>33</sup>

## Doing History in the Anthropocene

Another crucial aspect is that of doing history *in* the Anthropocene. Here, the key question is “What does the Anthropocene mean for history?” with the opposite extremes being “Which opportunities does it open up?” and “Does it make history impossible?” The discussion of these issues in the humanities has hitherto largely been centered around Chakrabarty’s 2009 “The Climate of History: Four Theses,” included in his recent book *The Climate of History in a Planetary Age*. Chakrabarty begins his landmark essay with the image, drawn from Alan Weisman’s best-selling novel *The World Without Us*, of a world from which humans have suddenly disappeared. This thought-experiment not only shows how our current planetary crisis can evoke “a sense of the present that disconnects the future from the past by putting such a future beyond the grasp of historical sensibility.”<sup>34</sup> It is also suggestive of the fact that the awareness of humanity’s finitude and of the possibility of human extinction—heightened by the Anthropocene—destroys our common, modernist sense of history:

The discipline of history exists on the assumption that our past, present, and future are connected by a certain continuity of human experience. We normally envisage the future with the help of the same faculty that allows us to picture the past. [...] To go along with Weisman’s experiment, we have to insert ourselves into a future “without us” in order to be able to visualize it. Thus, our usual historical practices for visualizing times, past and future [...] inaccessible to us personally—the exercise of historical understanding—are thrown into a deep contradiction [...].<sup>35</sup>

Following up on this general point, Chakrabarty lists a number of more specific assumptions of history challenged by the Anthropocene, such as the distinction between human and natural history, that between modern freedoms and the exploitation of the Earth’s resources, and that between humans as individuals or collectives and humanity as a species. At the heart of the essay stands a specific view on the legacy of modernity or Enlightenment rationality. On the one hand, Chakrabarty writes that the Anthropocene might best be seen as an unintended consequence of human choices and activities, whether political or scientific. At the same time, he firmly believes that “any thought of the way out of our current predicament cannot but refer to the idea of deploying reason. [I]n the era of the Anthropocene, we need the Enlightenment (that is, reason) even more than in the past.”<sup>36</sup> According to him, there is a crucial role to be played by historical knowledge, in this regard, albeit one that underlines the paradox of history in the current age: It needs to obtain knowledge of that which makes it impossible, that is, we should achieve self-understanding as a species to make sense of the Anthropocene, but this very standpoint defies historical understanding. This particular line of thinking has recently been brought to a climax by Zoltán Boldizsár Simon, who argues that

<sup>30</sup> For recent outputs of these projects, see Kelly et al., *Rivers of the Anthropocene* and the recent “Perspectives on the Technosphere,” Special Issue of *The Anthropocene Review*.

<sup>31</sup> See Bonneuil and Fressoz, *Shock of the Anthropocene*. See also Horn and Bergthaller, *Anthropocene*, chap. 3.

<sup>32</sup> Cf. Ruddiman, “Anthropogenic Greenhouse Era” and Steffen et al., “The Anthropocene.” See also Bauer and Ellis, “The Anthropocene Divide.”

<sup>33</sup> See, for instance, Schäfer et al., “Earth’s Future.”

<sup>34</sup> Chakrabarty, “Climate of History,” 197.

<sup>35</sup> *Ibid.*

<sup>36</sup> *Ibid.*, 210.

the Anthropocene has no history: As an unprecedented event, it represents an epochal break with, and a different temporality than, the continuity associated with processual historical change.<sup>37</sup>

Chakrabarty's essay, and the historiographical studies written in its wake, resonates with more recent work on doing history in the twenty-first century, such as Jo Guldi and David Armitage's *The History Manifesto* (2014), Francois Hartog's *Regimes of Historicity* (2015) and Jürgen Renn's *The Evolution of Knowledge* (2020). All these works, in one way or another, argue for a future-oriented history. Guldi and Armitage have, rather exaggeratedly, criticized what Hartog calls the emergence of "presentism" as the new "regime of historicity" in the West.<sup>38</sup> After 1989, both the past and the future have "collapsed as points of orientation" and, as a result, history has been "stuck in the present."<sup>39</sup> Guldi and Armitage, in their enthusiasm for the massive digitization of sources and the new opportunities for quantitative analysis, urge historians to return to the historical perspective of the *longue durée*.

Renn, for his part, offers a grand narrative of human history, one going back to the dawn of civilization but oriented to Earth's "imminent and distant future."<sup>40</sup> For Renn, knowledge, in the form of science and technology, is both the problem of and solution to the Anthropocene. On the one hand, science and technology are for us what stone tools, hunting, gathering, and later food production and shelters, etc., were for the Holocene: essential conditions of human life. Indeed, he holds the global fate of humanity to be increasingly dependent on the achievements and further extension of scientific and technological knowledge, which, as such, form the basis of our transformation into a geological agent. On the other hand, he recognizes that along with their rapid progress, science and technology have contributed much to our current planetary crisis by generating and enabling uncontrolled growth and the ruthless exploitation of natural resources. Hence, since it does not in and of itself guarantee human survival, science needs to be reoriented for the Anthropocene. This essentially means two things: Its role as a guide in a "fragile world whose future depends on it" should be cultivated and this must be done through a better understanding of the evolutionary dynamics of human knowledge *in toto*.<sup>41</sup>

Taken together, if *more* scientific knowledge is the answer to our problems, this answer also crucially depends on *more* historical knowledge of humanity's epistemic development. Not unlike Chakrabarty, Renn's underlying motivation may be said to be that of critically *rethinking* the promises of Enlightenment ideals, rather than *overthrowing* them. It is knowledge that made it possible for us to (unwisely) leave the stable state of the Holocene and it is knowledge, of all possible stripes, that will have to help us prevent future catastrophe.

### Scientific Ignorance in the Agnotocene

Enter the Agnotocene. Although the Anthropocene narrative seems here to stay, many alternatives have been proposed under the banner of pluralization.<sup>42</sup> Of all "cenes," the Agnotocene is the candidate most directly (and complexly) related to the kind of critical Enlightenment thinking implicit in the dominant views on writing history in the Anthropocene. The motivation for the Agnotocene, first proposed by Bonneuil and Fressoz, is that the Anthropocene is more an outcome of ignorance rather than of knowledge. Our current ecological crisis, they argue, is very much a result of deliberately ignoring environmental warnings, arguably more than it is an unintended consequence of science and technology. Perhaps it is true that no one really *intended* to destroy the planet, but much harm has been done through systematic *neglect* and *denial* of planetary limits and boundaries. Hence, they continue, there is no guarantee that *more* (scientific) knowledge will necessarily do more good than harm.

Much like the Anthropocene concept, the notion of the Agnotocene emphasizes that dealing with the major environmental problems on a planetary scale we are facing today is not only political and economic but also epistemic: It involves questions about the legitimacy, availability, and relevance of knowledge—as much as its illegitimacy, unavailability, and irrelevance—and about what knowledge and which forms of knowledge are ignored, devalued, or suppressed, and why. At the same time, more than the Anthropocene concept, the Agnotocene is centered around the idea that our entrance into a world of limits, a world where endless progress has become impossible in the face of finitude, is "marked by a greater visibility of the

<sup>37</sup> See Simon, "Facing the Unprecedented." See also Hamilton, "The Anthropocene as Rupture."

<sup>38</sup> See Hartog, *Regimes of Historicity*.

<sup>39</sup> Lorenz, "Unstuck in Time," 93.

<sup>40</sup> Renn, "Evolution of Knowledge," 3.

<sup>41</sup> Renn quoted in Coen, "Knowledge in the Anthropocene," 256.

<sup>42</sup> Steve Mentz's *Break up the Anthropocene* provides a tentative list of twenty-four "cenes." See Mentz, *Break up the Anthropocene*. For an influential plea against the Anthropocene see, for instance, Malm and Hornborg, "The Geology of Mankind?"

limits of scientific knowledge."<sup>43</sup> These epistemic limits make themselves felt in different ways. On the most general level, as Agnotocene thinkers have it, far from the advent of the "Age of Man" in which humanity masters and is remaking a human planet, the Anthropocene era attests to humanity's powerful impotence.

This is neither a comfortable nor a widely accepted view. Faced with climate change and massive species extinction, some hold that we already know all we need to know to fix these problems: What is needed is action. Others seem to anticipate geo-engineered feats that will allow the "Anthropos" to master the Earth system and catapult humanity out of the current crisis. Yet others, not convinced of the extremes of human self-sacrifice or superiority, follow the middle path, insisting that science should embrace piecemeal ethical projects.<sup>44</sup> What all these approaches share, and what sets them apart from the more fashionable ecological philosophies exploring the ontological side of the Anthropocene, is not only an emphasis on knowledge but also a vision of epistemic optimism.<sup>45</sup> Sometimes this takes the form of almost unlimited confidence in science and about what can be achieved in its name. At other times, it takes the shape of the hope that we will be able to obtain the knowledge on which our future depends and that, once available and wisely applied, this knowledge will either allow us to regain control of what is bringing about the Anthropocene or even lead to a "good Anthropocene."<sup>46</sup>

At the core of *An Ecomodernist Manifesto* (2015), for instance, stands the conviction that the only barriers to a grand new era in the history of the Earth are the fear of natural limits and human self-doubt. But also in its less overtly (eco)modernist guise—when the Anthropocene is taken up as a historical moment rather than welcomed as our benevolent future—the standard Anthropocene narrative allows surprisingly little room for epistemic humility. Importantly, such humility, inspired either by unavoidable uncertainties, non-mitigatable risks, or fundamental ignorance, is not the same as acquiesce, or an argument to delay much-needed action. Instead, it is arguably best understood as a call to *study* not knowing with the aim of improving the capacity to cope with what is unknown and of illuminating how it can actually be a source of actionable knowledge.<sup>47</sup> This call extends to the need to produce historical knowledge about ignorance, while giving this study a sense of urgency. At the same time, the emphasis on limits and ignorance arguably also extends to historical knowledge.

## History of Knowledge for the Agnotocene

If the Anthropocene could offer the history of knowledge an organizing narrative—a timely challenge to which it responds—the Agnotocene concept might help bridge the gap with the burgeoning fields of ignorance studies and agnotology.<sup>48</sup> According to scholars working in these fields, ignorance, rather than knowledge, is frequently what needs to be explained, which is mostly done with reference to science. Here, Robert Proctor's tobacco study, and Naomi Oreskes and Erik Conway's study of global warming are key examples.<sup>49</sup> Proctor has shown that in the discourse on the connection between smoking and cancer, ignorance was not a mere lack of knowledge but a socially produced and maintained phenomena. Similarly, Oreskes and Conway demonstrate that ignorance of climate change exists as an intentional phenomenon, created by a loose-knit group of high-level scientists and scientific advisers. These and other studies arguably hold an important lesson for historians of knowledge, who, in turn, might add a crucial historical dimension to the present-day focus of agnotology and move its focus beyond science.<sup>50</sup>

The importance of historicizing the Anthropocene through the lens of epistemic limits and scientific ignorance becomes apparent in several ways. First, there are the new epistemic challenges posed by, and standing at the heart of, the Anthropocene as a geological epoch. Taking Renn's position in *The Evolution of Knowledge* as an example, these challenges center around making it possible first to find out on what knowledge our future depends and then to produce this knowledge: They concern the organization, integration, adaptation, and implementation of scientific knowledge.<sup>51</sup> What is strikingly absent from this list is the situation where a piece of knowledge becomes available too late or turns out to be unavailable.

<sup>43</sup> Bonneuil and Fressoz, *Shock of the Anthropocene*, 24.

<sup>44</sup> For an overview of these different positions—"the good, the bad, and the ugly"—see Dalby, "Framing the Anthropocene."

<sup>45</sup> Renn, *Evolution of Knowledge*, 378.

<sup>46</sup> The idea of the "good Anthropocene" is defended in Asafu-Adjaye et al., *Eco-Modernist Manifesto*. For a criticism see, for example, Hamilton, "Theodicy."

<sup>47</sup> For examples, see the introduction to Theme Issue "Responding and Adapting to Climate Change: Uncertainty as Knowledge." Lewandowsky et al., "Uncertainty as Knowledge."

<sup>48</sup> See, for example, the essays in Gross and McGoey, *Ignorance Studies*.

<sup>49</sup> For these and other examples, see Proctor and Schiebinger, *Agnotology*.

<sup>50</sup> A first, important step in this direction was taken in Zwierlein, "Introduction."

<sup>51</sup> See Renn, *Evolution of Knowledge*, chap. 16.

And no mention is made of the fact that new knowledge is never fully complete knowledge and that it sometimes leads not to less but to more unknowns.

Second, there is the modernist tendency to present knowledge and ignorance as opposites and to see the latter as a temporary lack or absence of the former. This tendency often shows itself in the form of an expression of epistemic optimism, whether it is hope that a knowledge gap will eventually be filled, the expectation that a burden of radical uncertainty or error will in time be lifted, the assurance that an unknown can always be turned into a knowable risk, or even the dream of epistemic omnipotence.<sup>52</sup> However, any attempt to deal with ignorance by denying its existence—such as by presenting it as an empty negative—sits uncomfortably with the reality of scientific ignorance in our world.

Science has traditionally been understood, among epistemologists and historians and philosophers of science alike, as the foremost producer of knowledge. Hence, it is knowledge—human's triumph over ignorance—that is seen to stand in need of explanation and justification. Since a decade or so, the study of ignorance has been on the rise. One strand is that of agnotology, which stresses that the lack of research about ignorance is as unsurprising as it is remarkable given “how much ignorance there is, how many kinds there are and how consequential ignorance is in our lives.”<sup>53</sup> What this field shows is not only that science is an important source of ignorance but also that scientific ignorance is a more complex phenomenon than previously thought. The examples are numerous: whether it is climate change or the health effects of environmental pollutants, scientific ignorance is “not just the void that precedes knowledge,” it is also—in fact, it is especially—something “made, maintained, and manipulated.”<sup>54</sup> Whereas the focus of agnotology is mainly on the negative side-effects of ignorance, the wider field of ignorance studies also draws attention to the positive side of ignorance, understood as a productive or creative force. Several recent studies have explored the ways in which ignorance can be used, both by those in a position of power and those subject to it, as a resource “enabling knowledge to be deflected, obscured, concealed or magnified.”<sup>55</sup>

Both fields go against the grain of traditional sentiments. It is not knowledge but ignorance that needs to be explained and justified. Rather than as a temporary lack or absence or as the categorical opposite of knowledge, it must be seen as a phenomenon in itself, one that is key to analyzing and grasping today's world, whether understood in terms of a non-knowledge society or the Agnotocene.<sup>56</sup> Recently, philosophers have also joined the fray, asking what ignorance is, what kinds there are, and what role these play in the search for knowledge.<sup>57</sup> What they are showing, sometimes in great technical detail, is three-fold. First, that it is possible to have knowledge of what is unknown (as evidenced by terms such as conscious ignorance, non-knowledge, negative knowledge). Second, that there is a dynamic between ignorance and knowledge, between the unknown and the known, that changes over time. And, third, that the study of this dynamic offers insights about knowledge that cannot be gained via the study of knowledge alone. All these phenomena await historical scrutiny. Who, if not the historian of knowledge, will take up this task?

Taken together, and to return to the Agnotocene notion, there is wide-spread agreement that the Anthropocene is an epistemic challenge, and this in several, complexly related ways. On the one hand, it represents a critical stage in human evolution where knowledge, in the form of science and technology, has become an essential condition of human life. It is the outcome of the negative side-effects of science and technology as much as it is characterized by the increasing dependence on their further extension. On the other hand, by virtue of all this, the Anthropocene highlights the centrality of ignorance to our present epistemic condition, which is no longer that of “infinite horizons and new worlds.”<sup>58</sup> What the Agnotocene narrative puts before our eyes is the underlying epistemic optimism of the official narrative of the Anthropocene, the “story of awakening”: “we” unknowingly destroyed nature, making the Earth system enter a new geological epoch, but now that we have finally come to know this, we can use the same power—scientific knowledge—that enabled us to destroy to work our way out of the crisis and prevent catastrophe.<sup>59</sup>

<sup>52</sup> This phrase appears in the title of Jerome Ravetz's 1993 article, “Sin of science.” The notion of epistemic omnipotence is explored in Connor, *Madness*.

<sup>53</sup> Proctor, “Preface,” in Proctor and Schiebinger, *Agnotology*, 1–2.

<sup>54</sup> Kourany and Carrier, *Ignorance*, 3; Proctor in Proctor and Schiebinger, *Agnotology*, 8.

<sup>55</sup> McGoey, “Strategic unknowns,” 1.

<sup>56</sup> See the essays in McGoey, *Sociology of Ignorance*, for examples. See also Gross, “Risk as Zombie Category.”

<sup>57</sup> See, for example, Peels and Blaauw, *Ignorance*.

<sup>58</sup> Renn, *Evolution of Knowledge*, 408.

<sup>59</sup> See Bonneuil and Fressoz, *Shock of the Anthropocene*, xiii.



This is a myth, not so much because it is historically false, but because it presents the solution in terms of a way of thinking, a set of assumptions, that is itself part of the problem. A lot has been written about how the Anthropocene renders modernity's nature/culture divide untenable.<sup>60</sup> The same does not hold for that other pillar of modernity, the knowledge/ignorance divide, which tends to go unquestioned within the large and ever growing literature on the Anthropocene. One question this gives rise to is what new perspectives are opened up for history. This essay has argued that, among other things, scientific ignorance presents itself as a relevant and timely object of historical study. Another, more difficult question concerns the status and value of historical knowledge: What, if anything, can it mean to develop a future-oriented history of ignorance that matters to the present?

### **Conclusion: Historical Knowledge for the Anthropocene**

It is possible to accept the arrival of the Anthropocene while challenging the Anthropocene narrative. The fact that the Anthropocene is here—that it is our new human condition—does not imply the truth of its grand story—that of an “errant human species and its redemption by science.”<sup>61</sup> Indeed, such notions as the Agnotocene invite us to see the Anthropocene in other terms than that of modernity and Enlightenment<sup>62</sup>: It is a challenge that cannot be left to science alone and that cannot simply be solved by the accumulation of knowledge. This creates an uncomfortable situation. The Anthropocene rightly emphasizes the increase of humankind's power, which is based to a large extent on scientific knowledge. But it is this same kind of knowledge that allows us to destroy the planet. Hence, in order to save itself and to prevent planetary catastrophe, humanity seems to have to find strength in weakness, which is perhaps the only strength it lacks. How to develop this strength, how to turn humility into an epistemic resource for wisdom and action?

This paper has argued that the history of knowledge has an important role to play, in this regard. It not only unearths other, neglected, suppressed or missing knowledges but also historicizes the boundaries and hierarchies between science and other forms of knowledge and between different forms of knowledge and different forms of “non-knowledge.” The history of knowledge can place current epistemic concerns within a long-term perspective and make historical knowledge matter to today's world. As such, it might be said to be ideally suited to capture the historical specificity of our 21<sup>st</sup> century present.

At the same time, understood as an epistemic challenge, the Anthropocene also confronts historians with major historiographical challenges, which historians of knowledge should take seriously. First of all, the fact that more knowledge, more power, is not always the solution to problems of knowledge also applies to historical knowledge of our knowledge—reflexive knowledge—and of our non-knowledge—rational, reflexive ignorance. Secondly, is historicization, or a long-term perspective more generally—both based on a model of gradual historical change—still needed or even possible in a world where humanity faces “unprecedented change?”<sup>63</sup> Does it make sense to show that the Anthropocene has a history? These are difficult questions that can only be answered through a collective and collaborative process of disciplinary self-reflection. Together, they point to the problem of “anthropocenic history”: What does it mean to write history in an epoch that demands the study of the past to again become future-oriented without, thereby, returning to a modernist position? Among other things, it asks historians to become aware of their understanding of and relation towards the present.

### **Acknowledgements**

A previous version of this paper was read and discussed at the Knowledge Frontiers Symposium “The Anthropocene,” 17–26 November 2020, organized by The British Academy and the Royal Netherlands Academy of Arts & Sciences. I would like to thank the participants in this virtual meeting for their stimulating comments and suggestions. My special thanks go to the editors and reviewers of the *Journal for the History of Knowledge*.

### **Competing Interests**

The author has no competing interests to declare.

<sup>60</sup> This theme is influentially pursued in Latour, *Facing Gaia*.

<sup>61</sup> Bonneuil and Fressoz, *Shock of the Anthropocene*, xii.

<sup>62</sup> The case is forcefully made in Hamilton et al.

<sup>63</sup> See Simon, “Facing the Unprecedented.”

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**How to cite this article:** Verburgt, Lukas M. "History, Scientific Ignorance, and the Anthropocene." *Journal for the History of Knowledge* 2, no. 1 (2021): 12, pp. 1–12. DOI: <https://doi.org/10.5334/jhk.46>

**Submitted:** 01 October 2020

**Accepted:** 22 June 2021

**Published:** 29 November 2021

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