

AHR Roundtable: History Meets Biology  
 Comment

## Historical Inquiry as a Distributed, Nomothetic, Evolutionary Discipline

*Many persons seem to believe that what is termed Science is of a widely different nature from ordinary knowledge, and that the methods by which scientific truths are ascertained involve mental operations of a recondite and mysterious nature . . . But any one who looks into the matter attentively will soon perceive that there is no solid foundation for the belief that the realm of science is thus shut off from that of common sense; or that the mode of investigation which yields such wonderful results to the investigator is different in kind from that which is employed for the commonest purposes of everyday existence.*

T. H. Huxley, *The Crayfish: An Introduction to the Study of Zoology* (1880)

In his insightful yet controversial book *What Is History?*, the English historian Edward Hallett Carr proposed that undertaking the dry, objective accretion of facts in their proper chronological sequence was not the proper task of the historian.<sup>1</sup> Rather, it was to enter into an “unending dialogue” with the past through a judicious selection of which facts to pay attention to, the manner in which these facts are linked together to form an understanding of past events, and a consideration of the implications (or lack thereof) that this understanding might have for the manner in which individuals and groups conduct themselves. While there are many points of departure between Carr’s views and those of the participants in this roundtable, the attempt to incorporate new facts, concepts, and approaches from the biological and evolutionary sciences

<sup>1</sup> E. H. Carr, *What Is History?* The George Macaulay Trevelyan Lectures Delivered in the University of Cambridge, January–March 1961 (Harmondsworth, 1964).

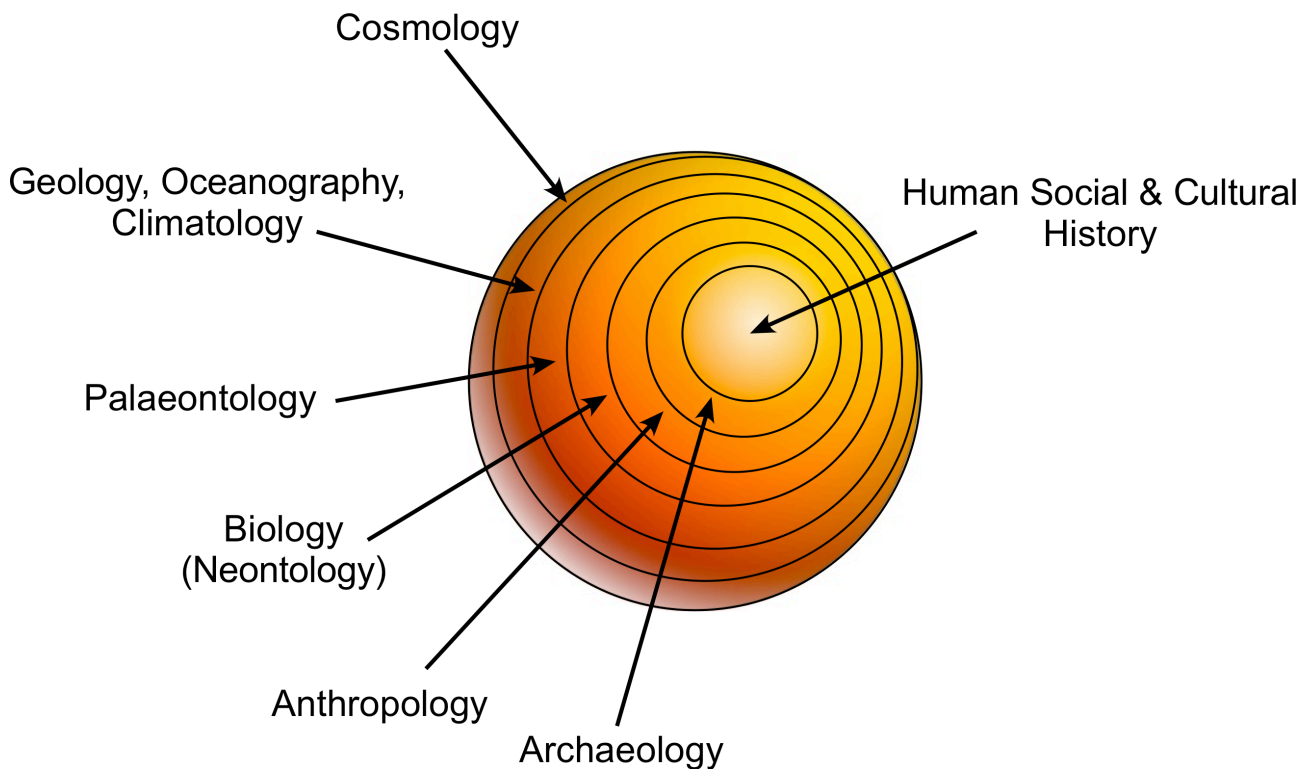


FIGURE 1: Hierarchical structure of the historical domains of intellectual inquiry.

into the corpus of historical inquiry seems to me very much in keeping with Carr's broad theme of history being an expanding, dynamic, positive, and relevant force in human affairs.<sup>2</sup>

Few can deny the impact that developments in genetics and evolutionary studies have had on society to date. But even more profound are the indications that these developments may also have consequences for how we understand what it is to be human from cognitive, social, psychological, and behavioral points of view. Accordingly, I believe that we can dispense with the kneejerk reaction that all this fuss about biology and history is simply an attempt by historians to jump on the biological bandwagon or serve as "fifth column" insurgents conscripted to assist a biological imperium in the conquest and colonization of history. As is well exemplified by this collection of essays, the questions being raised by many biologists regarding information relevant to the interpretation of the past, the tools that can be used to analyze this information, and the manner in which these results alter our assessments of past events are both challenging and compelling. It is high time for mainstream historians to come to grips with these developments and join the conversation that is already taking place among biologists—not in a passive manner that simply accepts whatever biologists have to say, but in the spirit of a dialogue that emphasizes the contributions that biologists can make to the study of history and that historians can make to the study of biology.

This is not to say that tensions between biology and history no longer exist. They do. This can be seen clearly in a number of statements made by the roundtable authors. Reading these essays as a member of the scientific community, I could not help but be struck by the sense of apprehension and defensiveness present in several passages. They read as though historians regard biologists as belonging to a different "tribe" with different outlooks, standards, traditions, motivations, opportunities, and constraints. But regardless of these impressions, the study of human history forms the most proximal part of an intellectual continuum that unites many disciplines, and aspects of disciplines, that have been regarded traditionally as separate, if not incommensurate. (See Figure 1.)

Historians are by no means unique with regard to appreciating the difficulties inherent in explaining the importance of historical data to doubting colleagues. In the case of my own field, paleontologists are forever having to justify the importance of a historical perspective to skeptical geologists, oceanographers, climatologists, and (yes) biologists, many of whom view the fossil ( historical) record as mildly interesting, but so woefully incomplete and inaccessible for the purposes of experimentation as to be, for all intents and purposes, useless, at least in terms of resolving the questions they regard as important. Sound familiar?

<sup>2</sup> Richard J. Evans, In *Defence of History*, new ed. (London, 2001); David Cannadine, ed., *What Is History Now?* (Houndmills, 2002).

Accepting, then, that there need be no divide between the study of natural history and the study of human social, cultural, and economic history, what can biology contribute to history, and what can history contribute to biology? The essays collected in this roundtable contain a number of examples of the former, ranging from Walter Scheidel's arresting discussion of the possibility that a heritable propensity for subconscious learning "achieved through neurochemical processes mediated by early childhood association" may be responsible for the culturally widespread human incest taboo, to the interesting case made by Brooke and Larsen for a process of Neolithic socio-ecological niche construction being responsible for the social stratification that has characterized most human populations from that time to the present. The latter concept includes the thought-provoking suggestion that the settlement of human populations into agrarian-based communities resulted in production of a sociocultural "environment" that favored the expression of high levels of aggression—up to and including homicide—rather than reducing it (see the essay by Randolph Roth).

But is the idea that historians should pay attention to biological data enough? Is there really a question mark over the extent to which the practice of history might benefit from the consideration of information provided by science?<sup>3</sup> And will the simple proffering of alternative, biologically informed readings of the historical record be adequate to convince skeptical historians to add the works of neuroscientists, sociobiologists, evolutionary psychologists, evolutionary biologists, and the like to their students', and their own, already extensive reading lists? Perhaps the roundtable authors are being too cautious in their advocacy of the power of this approach, of its importance to the ongoing development of these two fields, and in their appreciation of the effect that a genuine engagement will have on practices, priorities, and standards in both fields.

Biology, like all sciences, is grounded on the twin foundations of the discovery of new facts and the testing of statements regarding the manner in which natural processes operate. New facts are discovered (usually) by traveling to new locations either physically (e.g., trained experts gaining access to unexplored regions) or via technologies that extend human senses (e.g., invention of the telescope, microscope, and synchrotron). Hypothesis tests are constructed, and evaluated, on the principles of inferential logic and may use results obtained through the employment of advanced technologies, though this is not always the case. Despite these formalized supports, at some degree of resolution our knowledge of all biological systems, like our knowledge of history, is imperfect—in many cases profoundly so. Nevertheless, perfect knowledge of all aspects of a phenomenon or historical event is not necessary before insights can be gained. For example, the laws of genetic heritability were worked out almost a century before the location of genes was confirmed and the structure of the DNA molecule determined.<sup>4</sup> Often it is the case that advances in historical understanding are made when, in response to developments in allied fields, researchers pose new questions, gain access to and skill in the use of new technologies, and collect and interpret new data.

From these points of view, the practice of science is in many ways identical to the practice of history. Scientists, like historians, selectively choose which "facts" they will pay attention to or collect. This choice is informed by the theories and hypotheses that form the core structure of scientific investigation, as well as by the backgrounds and personal histories of individual scientists. As a result, scientists, like historians, are influenced by the society that surrounds them, up to and including interpretation of the results of their investigations.<sup>5</sup> Science is philosophically committed to progressivism and deterministic causality, despite in some cases admitting important roles for contingency and constraint.<sup>6</sup> In short, as the practice of history

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<sup>3</sup> See previous historical studies by Jared Diamond, *Guns, Germs and Steel: The Fates of Human Societies* (New York, 1997); Joseph P. Byrne, *The Black Death* (Westport, Conn., 2004); Wolfgang Behringer, *A Cultural History of Climate* (Cambridge, 2009); and John L. Brooke, *Climate Change and the Course of Global History: A Rough History* (Cambridge, 2014), all of which make extensive use of previous results of research performed and published by scientists.

<sup>4</sup> Ernst Mayr and William B. Provine, *The Evolutionary Synthesis: Perspectives on the Unification of Biology* (Cambridge, Mass., 1980); Peter J. Bowler, *Evolution: The History of an Idea*, 4th revised ed. (Berkeley, Calif., 2009).

<sup>5</sup> Although the idea of collecting theory-free observations was popular in the 1800s, especially among geologists, subsequent considerations of this concept by historians and philosophers of science have cast doubt on the idea that there can ever be such a thing as a truly objective, theory-neutral observation or measurement in the context of a formal hypothesis test. Indeed, explicit reference to a theory or hypothesis is required in order to make a decision as to what to observe or what to measure. Karl Popper, *The Logic of Scientific Discovery*, 2nd ed. (New York, 2002); Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2nd ed. (Chicago, 1970); Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England*, 2nd ed. (Chicago, 1995); Lorraine Daston and Peter Galison, *Objectivity* (Cambridge, 2010).

<sup>6</sup> A number of historians of science have noted the tendency of scientific theories and hypotheses to reflect issues of concern in the general population at the time of the theory's development. I can think of no better example of this trend than the history of the the ever-changing speculations surrounding the question of dinosaur extinction. Michael J. Benton, *Scientific Methodologies in Collision: The History of the Study of the Extinction of the Dinosaurs*, *Evolutionary Biology* 24 (1990): 371–400; W. J. T. Mitchell, *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago, 1998).

means engaging in an unending dialogue with the past in order to understand the present and make reasoned choices about future courses of action, the practice of biology means engaging in an unending dialogue with nature, part of which is located in the present, but a far larger part of which is located in the past, for the same purpose.

A number of the authors here lament the fact that controlled experiments of the sort that would be necessary to resolve many historical questions (e.g., What were the causes of the French Revolution? What precipitated the fall of the Roman Empire?) are impossible to perform. This stance essentially equates science with controlled experimentation. Science, in general, and biology, in particular, cannot be, and are not, so defined. All scientific questions that involve a consideration of past events (e.g., What were the causes of the Cretaceous-Paleogene mass extinction?) are subject to this same limitation. Experiments in the sense of either multiple events that took place in the past (e.g., revolutions, wars, economic depressions, decreases in social stratification) or unique combinations of “environmental factors” (e.g., famines, plagues, unusually severe storms, natural catastrophes, climate change, technological developments, conceptual advances) that coincided with these events at different times and in different places throughout human history constitute the historical analogue of what scientists term “natural experiments.”

There appears to be a widespread tendency, both in science and in history, to make particular events the focus of intense investigation in order to (1) establish the true sequence of events and (2) construct a narrative account of how, in the face of inadequately detailed evidence, particular factors, issues, or drivers might have “caused” particular events. Thus, national debt, social inequality, unpopular laws, failure of political reforms, famine, climate change, national character, and the rise of Enlightenment philosophy have all been postulated, separately and in combination, to be the “cause” of the French Revolution, just as competition with mammals, sea-level change, volcanic eruption, comet impact, radiation resulting from a nearby supernova, smoking, and even hunting of dinosaurs by aliens have, separately and in combination, been proposed to be the cause of the Cretaceous-Paleogene mass extinction. As a means of testing hypotheses of causation for historical events, exclusive focus on single examples is a dubious research strategy because it prevents demonstration of a consistent, and so predictable, link between the occurrence of a cause and the appearance of an effect.

For the natural sciences, the research design necessary for establishing causality in data derived from natural experiments such as ancient extinctions has been described best by the paleontologist David Raup: “There is no way of assessing cause and effect [in historical data] except to look for patterns of coincidence—and this requires multiple examinations of each cause-and-effect pair. If all extinction events are different the deciphering of any one of them will be next to impossible.”<sup>7</sup> Transferring this scientific principle to a historical context, if no commonality between the causes and effects exists in the human historical record, it will be logically impossible to determine the cause of any major event in that history. Of course, causes may still be proposed for single historical events. But in the absence of the demonstration of substantive repeatability, these should be understood as hypotheses at best. In the enthusiasm shown by biologists and historians for new historical facts, the possibility that associations are a matter of coincidence or an expression of the operation of other underlying factors is often downplayed to the detriment of a more holistic and rigorous hypothesis-driven approach to historical analysis.

Let me stress that this does not mean that the only valid approach to such analyses is comparative and/or quantitatively analytical, for such is not the case. Before the structure of, and correlates with, a historical event can be compared, they must first be identified and described. Accordingly, a detailed study of individual events is a necessary precursor to the evaluation of alternative causal hypotheses. The point I am making is that formal hypothesis tests of alternative statements regarding generalized historical causes and their effects need not be based only on the analysis of single events and need not be approached only in a narrative, rhetorical manner. If the requirements of a comparative hypothesis test can be fulfilled using data from the human historical record—as I believe several of the roundtable essays demonstrate—there is no reason to suppose that the conclusions reached by students of human history would, or should, be regarded as any less adequate, or any less well supported, than those of scientific researchers investigating a wide variety of longterm natural history phenomena.

We can see this process at work in the various roundtable contributions. For example, in Lynn Hunt’s essay, “The Self and Its History,” the embodied notion of “self” was developed by evolutionary neuroscientists such as John Searle, Daniel Dennett, and Steven Pinker as the outcome of a continuous epigenetic process that involves the brain interpreting interactions between the body and its environment. This evolutionary explanation of the origin of the self is preferred by these researchers to the older “computation machine” paradigm associated with Hilary Putnam and Jerry Fodor (and which itself originated as a reaction to the generalist and/or neonativist learner concepts of cognitive ontogeny associated with the developmental psychologist Jean Piaget) because it appears to makes sense of a greater array of observations—especially

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<sup>7</sup> David M. Raup, *Extinction: Bad Genes or Bad Luck?* (New York, 1991), 151.

the observation that children construct domain-specific knowledge continuously throughout development. Hunt's noteworthy historical turn is to suggest that this epigenetics-based theory of how humans acquire self awareness may provide a mechanistic explanation for a unique historical event: the development of a widespread interest in basic human rights at a particular time (1700s) and in a particular place (Europe) in human history. Under Hunt's hypothesis, when presented with books detailing the lives and travails of individuals less fortunate than themselves, the newly literate and increasingly independent middle class of eighteenth-century Europe came to appreciate the fact that all people resembled them in fundamental ways, thus establishing a basis of popular support for the idea that all humans possessed natural rights and should be treated equally in a fair and just society. Although Hunt's (understandable) focus on a singular historical event limits her ability to comment on the overall utility of the embodied notion of "self" as a factor that might account for generalized aspects of human history, she wisely notes that while neuroscience "does not have all the answers . . . it can help [historians] ask new questions and reframe old ones."

Of course, historical hypothesis-testing is a two-way street. Just as biological concepts and theories can shed light on the interpretation of historical events, the documentation of historical events can also shed light on the interpretation of biological concepts and theories. Curiously, while most of the essays included in this roundtable make cases for the former, none makes a determined case for the latter. The history-focused disciplines within the biological sciences contain many examples of careful documentation of the sequences of historical events that have the power to extend, modify, and in some cases overturn interpretations advanced for a variety of biological phenomena.<sup>8</sup> Historians should not suppose that they cannot, or should not, engage fully with this process of disciplinary reciprocal illumination. Contributing in this way is part of "joining the conversation," too.

The call to engage seriously with biologists and their data in an effort to advance the understanding of the past also may signal that segments of the history community are prepared to consider making a philosophical shift in the types of explanations they seek for historical events. The late paleobiologist and historian of science Stephen Jay Gould was fond of pointing out that the range of essential questions in any discipline is usually specified by the first competent thinkers to enter the field.<sup>9</sup> In the history of ideas, such questions have a transcendent quality that allows them to continue to be discussed, often by proxy, irrespective of developments or advances in understanding at lower levels. These essential questions form the intellectual scaffolding upon which observations, data, hypotheses, theories, schools of thought, and careers are draped.

In the field of paleontology, Gould suggested that the essential questions were three in number, concerning the directionality, motivation, and pattern of organic change. I suggest here that these same questions, or some minor rewording of them, can be considered as constituting the intellectual underpinning of all historical inquiry.

1. Does historical change have a preferred direction? Is the history of life and/or human social, cultural, political, and/or economic history progressing toward some specific state or goal (directionism), or are trends in biological and human affairs only apparent, relatively short-lived, random oscillations about some stable mean (steady-statism)?

In the history of biology, no single issue has received more attention or been the subject of more rancorous debate.<sup>10</sup> With regard to the realm of human social, cultural, and political history, the pronounced dichotomy between those of a conservative, steady-statist, uniformitarian bent (e.g., Karl Popper, Michael Oakshott, Lewis Namier) and colleagues who have adopted a more progressive, liberal, directionist point of view (e.g., E. H. Carr) is too obvious to dwell on. Of more importance to the present discussion is the point that locating a greater proportion of historical context and causality in epigenetic interactions between developing human

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<sup>8</sup> For an example of historical sequences in development substantially modifying the hypothesis that ontogeny recapitulates phylogeny, see G. R. de Beer, *Embryos and Ancestors* (Oxford, 1958). For an example of careful documentation of chronostratigraphic sequences of events substantially modifying interpretation of a saltational evolutionary event, see Norman MacLeod, *Punctuated Anagenesis and the Importance of Stratigraphy to Paleobiology*, *Paleobiology* 17, no. 2 (1991): 167–188. For an example of careful documentation of species extinction sequences substantially modifying the hypothesis that the Cretaceous-Paleogene mass extinction was caused by a comet impact, see N. MacLeod et al., *The Cretaceous-Tertiary Biotic Transition*, *Journal of the Geological Society of London* 154, no. 2 (1997): 265–292.

<sup>9</sup> Stephen Jay Gould, *Eternal Metaphors of Palaeontology*, in A. Hallam, ed., *Patterns of Evolution, as Illustrated by the Fossil Record* (Amsterdam, 1977), 1–26.

<sup>10</sup> Richard Dawkins, *The Blind Watchmaker* (New York, 1986); Stephen Jay Gould, *Time's Arrow, Time's Cycle: Myth and Metaphor in the Discovery of Geological Time* (Cambridge, Mass., 1987); Gould, *The Structure of Evolutionary Theory* (Cambridge, Mass., 2002); Michael Ruse, *Darwin and Design: Does Evolution Have a Purpose?* (Cambridge, Mass., 2003); Charles H. Lineweaver, Paul C. W. Davies, and Michael Ruse, *Complexity and the Arrow of Time* (Cambridge, 2013).

cognitive systems and their socioeconomic, cultural, and technological environments appears to represent a means through which a perceived problematic (and factually false) caricature of genetic determinism can be circumvented. Under this model, progressive, directional change in human affairs can be accounted for without the need to deny the existence, or the importance, of overarching genetic influences. Virtually all of the roundtable contributions reject strict genetic determinism as a feature of modern biological thought, and many claim implicitly that biologists' rejection of this model is, to a large extent, the reason why it is (now) possible for collaborations between historians and biologists to be explored. As a biologist, I question the notion that strict genetic determinism was ever part of modern biology (including sociobiology) and am greatly relieved that this perceived barrier to dialogue between our fields is breaking down.<sup>11</sup>

2. What is the motor of historical change? Does change come about primarily because of pressures placed on systems (organic and sociocultural) from the external environment (externalism), or does it arise independently from internal dynamics that reside within the structures of such systems themselves (internalism)?

At this juncture, I must hasten to point out that I am aware that the externalist/internalist (e/i) view of causal factors in the history of science has been the source of much debate since the works of Lyotard, Foucault, Rorty, Derrida, Gadamer, Latour, and others presented a credible challenge to the positivist-internalist histories of science in general as well as specific scientific fields (e.g., archaeology).<sup>12</sup> However, in this context I would draw attention to the comments of Steven Shapin in noting that the duration, rancor, and grip of the e/i controversy provides a compelling demonstration of this distinction's significance rather than serving to indicate its mis-specification.<sup>13</sup> Granted, defining the boundaries of a complex and dynamic enterprise such as science (not to mention history) is a fiendishly difficult task. But such distinctions have been, and are being, made routinely by governments, educational organizations, the media, funding agencies, and the general public, as well as by the communities in question themselves. Indeed, such a distinction is implicit in the aim of this roundtable, which is to consider how information drawn from inside biology might be used by historians who, by implication, stand outside biology. Some have attempted to make the e/i problem go away by imposing abstruse, disciplinespecific constraints on discourse, or worse still giving up and avoiding the issue altogether—in Shapin's words, by performing rites of "disciplinary purification."<sup>14</sup> Adhering to this strategy begs the question of whether the price paid by historians and sociologists of science for achieving ontological purity is too high if it involves sacrificing their ability to communicate with, contributing historical insight to debates involving, and so influencing, individuals outside their own community.

For historians, the history of historiography is littered with examples of analyses undertaken from explicitly externalist or internalist points of view. In most cases both factors are acknowledged to play important roles. But the personal interest/bias remains and indeed was the source of Carr's comment to "Study the historian before you begin to study the facts"—advice that is just as sound today as it was in 1961.<sup>15</sup> Certainly Carr dissented from many of his contemporaries (e.g., Oakeshott, TrevorRoper, Popper) on the question of the drivers of historical change as well as on the question of directionality.

With regard to this issue, here, once again, the specter of genetic determinism looms large. If the sorting of genetic variation through differential survival constrains the manner in which groups of humans can respond to environmental challenges, doesn't this mean that the potential scope for human populations to cope with change is limited and that the drivers of such change must be external? The liberal, positivist, progressive historian looks at the evidence of history, concludes "Such cannot be true," and on that basis rejects the biological view of human evolution as wrong, irrelevant, superseded by the advent of cognition/culture, and/or immoral. But again, this is a caricature of contemporary bio-evolutionary thought, wrong in fact and wrong in principle.

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<sup>11</sup> Richard Levins and Richard Lewontin, *The Dialectical Biologist* (Cambridge, Mass., 1985); Gould, *The Structure of Evolutionary Theory*; Steven Pinker, *The Blank Slate: The Modern Denial of Human Nature* (London, 2002); Edward O. Wilson, *Sociobiology: The New Synthesis*, 25th Anniversary Edition (Cambridge, Mass., 2000); Michael Ruse, *Sociobiology: Sense or Nonsense?* (Dordrecht, 2013); John Alcock, *The Triumph of Sociobiology* (Oxford, 2001); Wendy Johnson, Eric Turkheimer, Irving I. Gottesman, and Thomas J. Bouchard, Jr., *Beyond Heritability: Twin Studies in Behavioral Research*, *Current Directions in Psychological Science* 18, no. 4 (2009): 217–220.

<sup>12</sup> Osco Moro Abadía, *The History of Archaeology as Seen through the Externalism-Internalism Debate: Historical Development and Current Challenges*, *Bulletin of the History of Archaeology* 19, no. 2 (2009): 13–26.

<sup>13</sup> Steven Shapin, *Discipline and Bounding: The History and Sociology of Science as Seen through the Externalism-Internalism Debate*, *History of Science* 30 (1992): 333–369.

<sup>14</sup> Bruno Latour, *Science in Action: How to Follow Scientists and Engineers through Society* (Milton Keynes, 1987).

<sup>15</sup> Carr, *What Is History?*, 23

In his roundtable essay, “Coevolutionary History,” Edmund Russell advances coevolution as a dominant force in social and cultural change throughout human history, pointing primarily to the physical, conceptual, and social changes resulting from animal domestication and husbandry as being responsible for the transition from hunter-gatherer to agrarian economies, the Industrial Revolution, and the current explosion in human population size. In a similar vein, Brooke and Larsen point to recent changes in human biology over historical timescales conferred by the advent of lactose tolerance and resistance to malaria in their essay, “The Nurture of Nature: Genetics, Epigenetics, and Environment in Human Biohistory.” Both sets of historical events can be interpreted as evolutionary responses of the human species to changes imposed by external factors (e.g., limitations on the food resources and geographical areas available to support human populations). But both can also be seen as intra-specific evolutionary responses of human populations to changes imposed by internal factors, specifically inter-population competition. Under the latter, an intra-specific Red Queen Effect—that organisms must constantly adapt, not only to cope with external changes in the physical environment, but also to compete successfully against other organisms, of both their own and other species, which are themselves evolving in a dynamically changing environment—may be operating across human metapopulations through time. An eco-evolutionary “Red Queen” offers perhaps an equally compelling, and potentially a superior, model for understanding the true range of human social system controls.<sup>16</sup> This alternative model is particularly attractive insofar as, strictly speaking, the coevolution model denies that human populations have interfered in any way with any aspect of the reproductive processes in their domesticated species, an assumption that seems doubtful. Admission of the Red Queen and metapopulation dynamics to debates over the issue of human evolution in historical times has the advantage of forcing a consideration of both internal and external driving factors without presupposing which might be dominant. The Red Queen paradigm can also be extended to include human cultural evolution through the concept of meme-based cultural inheritance.<sup>17</sup> To my way of thinking, the inclusion of biological evidence and models of evolutionary change such as those advocated by Brooke and Larsen have the potential to broaden the scope and sharpen the focus of historical inquiry rather than serving to bias its outcome.

3. What is the tempo of historical change? Does historical change happen primarily through the accumulation of small or incremental changes over relatively long periods of time (gradualism), or is change concentrated in short, rapid bursts of activity between which consolidation and stasis reign supreme (saltationism)?

This question, too, has fascinated intellectuals for millennia. Arguably, God was a saltationist, having created plants, aquatic animals, and terrestrial animals on the third, fifth, and sixth days, respectively, after which no species (other than man) was added, became extinct, or changed.<sup>18</sup> In terms of human cultural history, one need look no further than the interplay between “feudalism,” capitalism, Marxism, and postmodernism to find socioeconomic analogues to religiously grounded static, materialist-gradualistic, class-centered saltationist, and hybrid worldviews.<sup>19</sup>

In their essays “The Sentimental Family” and “Evolutionary Psychology and the Historian,” Kyle Harper and Walter Scheidel grapple with this issue in the form of the biological mechanisms that might be responsible for promoting stasis in some types of human social relations for long spans of time, echoing implicitly the slogan of punctuated equilibria supporters, that “stasis is data.” These contributions focus on the maintenance of behavioral standards within families—especially in the case of the latter the incest taboo, for which purely cultural explanations have difficulty accounting—and highlight the role that human hormonal biochemistry

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<sup>16</sup> Leigh Van Valen, *A New Evolutionary Law*, *Evolutionary Theory* 1 (1973): 1–30; Geerat J. Vermeij, *Evolution and Escalation: An Ecological History of Life* (Princeton, N.J., 1987); Matt Ridley, *The Red Queen: Sex and the Evolution of Human Nature* (London, 1993); Katrina A. Lythgoe and Andrew F. Read, *Catching the Red Queen? The Advice of the Rose*, *Trends in Ecology & Evolution* 13, no. 12 (1998): 473–474.

<sup>17</sup> Richard Dawkins, *The Selfish Gene* (Oxford, 1976); Dawkins, *The Extended Phenotype: The Long Reach of the Gene* (Oxford, 1982); Dawkins, *The Blind Watchmaker*; Daniel C. Dennett, *Consciousness Explained* (New York, 1991); Dennett, *Darwin’s Dangerous Idea: Evolution and the Meanings of Life* (New York, 1995); Dennett, *Freedom Evolves* (New York, 2003); Kevin N. Laland, John Odling-Smee, and Marcus W. Feldman, *Niche Construction, Biological Evolution, and Cultural Change*, *Behavioral and Brain Sciences* 23, no. 1 (2000): 131–175.

<sup>18</sup> Genesis 1:1–2:3.

<sup>19</sup> Susan Reynolds, *Feudalism Fiefs and Vassals: The Medieval Evidence Reinterpreted* (Oxford, 1994); see also Elizabeth A. R. Brown, *The Tyranny of a Construct: Feudalism and Historians of Medieval Europe*, *American Historical Review* 79, no. 4 (October 1974): 1063–1088; Bruce Caldwell, ed., *The Road to Serfdom: Text and Documents—The Definitive Edition* (London, 2007); John Maynard Keynes, *The General Theory of Employment, Interest and Money* (Houndmills, 2007); Joseph A. Schumpeter, *Capitalism, Socialism and Democracy* (London, 2010); Ellen Meiksins Wood and John Bellamy Foster, *In Defense of History: Marxism and the Postmodern Agenda* (New York, 1997); Matt Perry, *Marxism and History* (Houndmills, 2002); Jack Lawrence Luzkoff, *What’s Left? Marxism, Utopianism, and the Revolt against History* (Lanham, Md., 2006); David Harvey, *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change* (Oxford, 1980); Hans Bertens, *The Idea of the Postmodern: A History* (London, 1995).

may have played in this regard. Both essays are excellent examples of the comparative approach to historical hypothesis-testing favored by evolutionary biologists, drawing support from observations across species as well as across cultures. Harper's contribution is also noteworthy in that he suggests that one possible explanation for another widely acknowledged and rapid cultural saltation event—the decline in fertility that often accompanies economic development—is that it may be due to a culturally contingent juxtaposition of factors including decreased infant mortality, increased lifespan, economic security, access to education, and increased opportunities for women to work outside the home. All or most of these factors operated in isolation in premodern societies within the context of which fertility rates remained high. In industrialized societies, however, these factors come together as a result of economic development, with a consequent reduction in fertility rates being recorded shortly thereafter. While a comparative approach such as the ones employed by these authors can demonstrate the association between these social factors and fertility rates, gaining an understanding of the specific biological, social, and cultural mechanisms that bring this transition about, and then maintain it in the face of subsequent economic downturns, will undoubtedly require additional collaborations between biologists, sociologists, and historians.

Finally, in the most skeptical contribution to the roundtable discussion, Julia Adeney Thomas argues that while biology can sometimes help explain patterns of association otherwise opaque to social, cultural, economic, and political analysis, the historical concept of human actors creating meaning remains critical and constitutes an aspect of historical analysis that only historians can deliver. Thomas underscores the need for history to maintain its disciplinary integrity and suggests that an additional benefit of a dialogue between historians and biologists might be clarification of history's unique social and political functions. History's unique role, she suggests, is to broaden our collective understanding of humanity's options for dealing with issues such as climate change based on documentation and analysis of the diversity of societal values, systems of social organization, and the manner in which previous societies have coped (or failed to cope) with similar external and internal pressures (albeit of lesser magnitude). Biologists, she states, "can help us understand our political predicament, but they cannot unilaterally provide the political imagination to resolve it."

My personal view is that neither historians or biologists qua discipline-focused specialists can presume to provide, or claim special responsibility for contributing to the provision of, solutions to complex contemporary social problems. Moreover, arguing that one field has unique political and moral responsibilities not shared with others is a questionable basis on which to advocate productive engagement. Just as historians should not accept anything that biologists might have to say uncritically or cede any measure of control over their data, results, interpretations, or opinions to biologists, neither should (nor I suspect will) biologists yield any measure of control over these same aspects of their work to historians. As Thomas points out, balance is important in any dialogue between individuals. If the dialogue between historians and biologists is to reach its full potential, it must be a meeting between equals who possess complementary sets of skills, data, and knowledge, who are open to the idea of having their views challenged constructively, and who can engage in the critical cut and thrust of robust debate because they are comfortable in their own intellectual skins.

I agree with Thomas that biologists and historians work on different scales of historical phenomena. While biology does not prefer the analysis of *Homo sapiens* in principle, the fact is, because of funding priorities, the overwhelming majority of the biological research done today either focuses on human biology directly (e.g., medical research, pharmaceutical research, evolutionary psychology) or deals with those aspects of nature that are important for improving the human condition (e.g., taxonomy, agricultural research, energy resource exploration and development). Historical research is, of course, entirely about human activity in all its guises. Just as biologists subdivide the organic world into specialist topics in order to focus their efforts on portions researchable by single individuals or small teams, historians focus on subsets of the human species, specific time intervals, and/or specific historical events whose boundaries are set by political, economic, sexual, social class, community, and family divisions. As a result, historians tend to see humanity as a set of distinct populations or interest groups whose histories have been analyzed and presented traditionally as if the whole did not exist.<sup>20</sup> In contrast, biologists cannot avoid treating all humans as a single entity united in their common biology and common evolutionary history. While both historians and biologists have contributed to the justification of prejudice, social exclusion, and unjust economic exploitation in the past, both fields have also been forces for the promotion of equality, freedom, social mobility, and economic development. In other words, our two communities have far more in common conceptually, historically, and in the outlooks of contemporary practitioners than is typically admitted. In those areas where they differ, the differences are, for the most part, complementary.

Breaking down the artificial barriers that have caused historians and biologists to pursue their dialogues with the past in splendid isolation from one another is unquestionably a positive development as well as one whose time has come. Considering the controversy that attended the emergence of sociobiology in the 1970s and 1980s, it is certain that the conversation will, at times, be difficult. Engaging in this dialogue will

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<sup>20</sup> Carr, *What Is History?*

challenge each discipline's stereotypes about the other and force both communities to grapple with data, ideas, traditions, and personal points of view that many may find difficult in several senses of that term. Such a dialogue will not be to everyone's taste. But there should be no expectation, and no need, for everyone in either community to be "on board" with this initiative in order for conversations to begin and, once begun, be extended.

The English novelist Leslie P. Hartley opened his 1953 coming-of-age novel *The Go-Between* with the line "The past is a foreign country: they do things differently there." This story makes the point that seemingly trivial actions can have unintended consequences that reverberate down through the years, sometimes changing the arc of entire lives. The roundtable participants' request for historians and biologists to begin a structured dialogue over the subset of systems, phenomena, and topics in which their domains overlap might seem trivial, even pointless, to some. The possibility exists that it will come to nothing, or nothing good (as it did for Hartley's characters). There are no guarantees, in life or in history. But in their own way, each of the contributors here argues against this view. The potential for this dialogue to be at the very least productive, and possibly transformative, is clearly there. If the efforts made by these authors are any indication of what might result from such engagement, the experiment seems well worth conducting.

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