

Why Be Against Darwin? Creationism, Racism, and the Roots of Anthropology

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ABSTRACT In this work, I review recent works in science studies and the history of science of relevance to biological anthropology. I will look at two rhetorical practices in human evolution—overstating our relationship with the apes and privileging ancestry over emergence—and their effects upon how human evolution and human diversity have been understood scientifically. I examine specifically the intellectual conflicts between Rudolf Virchow and Ernst Haeckel in the 19th century and G.

G. Simpson and Morris Goodman a century later. This will expose some previously concealed elements of the tangled histories of anthropology, genetics, and evolution—particularly in relation to the general roles of race and heredity in conceptualizing human origins. I argue that scientific racism and unscientific creationism are both threats to the scholarly enterprise, but that scientific racism is worse. *Yrbk Phys Anthropol* 55:95–104, 2012. © 2012 Wiley Periodicals, Inc.

Because the methods of science are so diverse (including observation, experimental manipulation, qualitative data collection, quantitative data analysis, empirical, and hermeneutic research; and ranging from the synchronic and mechanistic to the diachronic and historical), it has proven to be difficult to delimit science as practice. What seems to distinguish science from other domains of human thought and activity is not so much a methodological demarcation, as an epistemic demarcation. That is to say, what is unique and interesting is not what scientists do, but how they think (Feyerabend, 1975; Dupré, 1993). Malinowski (1925, 1935) called attention to the patterns of interpenetration between the world of magic and the world of reality among nonscientific people. Scientific thought is different, and an anthropological view of science can see it as bounded by three fundamental or epistemic assumptions that emerged in the 17th and 18th centuries. One such assumption of modern science is naturalism, the idea that there is a basic division to be drawn between the natural and the supernatural realms, the former being the domain of law and matter, and the latter of miracle and spirit. Another is empiricism, the idea that validity is judged exclusively by accuracy, a goodness of fit between theory and reality. And a third is rationalism, the idea that reason is the surest path to knowledge, to be privileged over other sources of knowledge, such as tradition, revelation, or intuition.

We can readily note that science strives to produce the most accurate knowledge about the universe and consequently often succeeds. Nevertheless, from the perspective of anthropology, and most specifically, an anthropology of science, even the choice to privilege empirical accuracy over all other criteria can be interrogated. There are, after all, mundane situations in which the empirical truth is to be assiduously avoided—for example, in polite conversation. It was Mencken (1956) who observed that everyone is entitled to the delusion that their spouse is attractive and their children are bright.¹

It is actually no great scandal to reject science. In the first place, nobody rejects all science; that person exists only in the imagination of a paranoiac. In the second place, we all have criteria for deciding what science to reject—at very least, we might generally agree to reject financially conflicted, racist, sexist, fraudulent, unethical, and/or incompetent science (Tucker, 2002; Goldacre, 2009; Marks, 2009a; Rosoff, 2010). If nothing else, the history of physical anthropology attests ably to that point (Little and Sussman, 2010). The people who did not accept Arthur Keith's scientific ideas about Piltdown Man, Robert Bennett Bean's scientific ideas about racial craniometrics, Charles Davenport's or Eugen Fischer's scientific ideas about race mixture, Earnest Hooton's scientific ideas about criminal anthropology and eugenics, Carleton Coon's polygenism, Richard Leakey's ER-1470, or David Pilbeam's *Ramapithecus* were the smart, critical thinkers. Science education does not consist of believing everything scientists say, however normative and authoritative it may seem—for that would be utter credulity, the very opposite of science education.

Biological anthropology occupies a unique position as a science. It is, after all, responsible for the production of

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¹Interestingly, specifically by analogy to the idea of freedom of religion (Mencken, 1956: 3).

the authoritative story of who we are and where we came from. That story, however, is a story of kinship and is necessarily highly politicized—as stories of origin and descent invariably are (Abu el-Haj [2001]; Zerubavel [2012]). This places cultural constraints and responsibilities upon the biological anthropologist that do not fall upon the biologist, if the domain of human evolution is seen as partaking jointly of the study of life (i.e., biology) and the study of how we see ourselves in relation to other kinds of beings (i.e., anthropology). That is why the Butler Act, prohibiting the teaching of evolution in Tennessee in the 1920s, did not ban evolution, but specifically *human* evolution, from the curriculum. The clash with the creationists has always been largely a cultural one (Livingstone, 1984; Robbins and Cohen, 2009). This ought perhaps to make anthropologists especially sensitive to the cultural issues involved. Where someone trained as a biologist might well avoid the matter entirely and stick to fruitflies, someone trained as an anthropologist ought to be uniquely situated to confront issues that are both epistemological/scientific and cultural/semiotic.

This is the juncture at which the scientific uniqueness of anthropology should become evident. As a person studying people, the anthropologist is denied the objectivity claimed by the biologist, as a person studying fruitflies (Coon, 1968). One classic solution is to pretend not to be a person. This literary trope was first made famous by Huxley (1863), who was attempting to convince his readers that, based on their physical features, humans ought to be zoologically classified with the apes. Of course, we are stuck in the position of being humans classifying humans, so how can we achieve the desired objective distance? Huxley's answer: By substituting science fiction for science and denying the one incontestable biological fact here—that we are human. So, “let us imagine ourselves scientific Saturnians,” says Huxley (1863: 85), and the point will become obvious—as if that constituted some kind of scientific argument, because obviously, there are no scientists on Saturn, and we have only Huxley's word on what they would think if there were. Some decades later, Osborn (1926: 3), the leading American authority on paleontology, used the same argument to a different end: “If an unbiased zoologist were to descend upon the earth from Mars and study the races of man with the same impartiality as the races of fishes, birds, and mammals, he would undoubtedly divide the existing races of man into several genera and into a very large number of species and subspecies.”² And Jared Diamond (1992: 2) would invoke a more generic “zoologist from Outer Space” to validate his assertion that the human species constitutes a “third chimpanzee.”

The contribution of anthropology, rather, is to acknowledge the impossibility of studying humans as if we were not ourselves human (Washburn, 1978) and to reconceptualize the project as necessarily a biocultural one, infused with cultural values of greater or lesser transparency, but no less scientific for it. Or at least more scientific than pretending that you are a Martian.

For example, the important lesson for biological anthropology of the punctuated equilibria wars of the 1980s is not that it is one (punctuated equilibria) or the other (phyletic gradualism) or both, but that a significant amount of cultural input goes into interpreting the fossil

record, most significantly in the dialectical relationship between continuity and discontinuity (Eldredge and Tattersall, 1982). The fossil record comes to us in sites and types and samples, and we impose meaning upon it: most fundamentally, taxonomic meaning, but (concurrently) processual and phylogenetic meaning as well. A fossil assemblage interpreted as one diverse species is understood to have been produced through somewhat different means than the same assemblage divided into six less-diverse species. At very least, the magnitude of gene flow would be considerably greater in the former case than in the latter case—by virtue of which the metaphor of the tree to describe the relationship among the populations would be less appropriate than an alternative metaphor, such as a trellis, capillary system, or rhizome (Hulse, 1962; Wolpoff and Caspari, 2000; Arnold, 2009).

Nor are lumping and splitting capricious practices. The taxonomic diversity of the human fossil record is contested precisely because it cannot be established in the familiar, synchronic, intuitive fashion of neontological systematics (which involves something about mating and gene pools and species recognition).³ After all, some component of paleoanthropological systematics is instrumental—there are social, interpersonal, and professional implications of any such practices, a “moral economy” of splitting and lumping. This is not tangential to the information nor is it added on to the information; it is fundamental to understanding the information itself.

If we cannot know just how many distinct evolutionary lineages there were among our ancestors, then what justification is there for pretending that we can, much less that we do? Overstating the case has never been good for science. Rather, we might consider the epistemological boundaries of biological anthropology—what we can and cannot know and what goes into “connecting the dots”—and define the field in terms of the unique kind of science that it is. The act of articulating and examining the basic assumptions that go into the production of knowledge is often called reflexivity (Woolgar, 1988) and is one of the hallmarks of contemporary anthropology. In this review, I will try to tease out some of the less obvious cultural aspects of the science of biological anthropology, building on reflexive studies in human variation (Goodman et al., 2003; Koenig et al., 2008), primatology (Strum and Fedigan, 2000; Corbey, 2005), and paleontology (Landau, 1984; Stoczkowski, 2002). In the light of recent historical research, I will look at two epistemic or cultural assumptions of evolutionary anthropology: imposing continuity upon discontinuity and privileging ancestry over emergence.

WE LURCH BETWEEN A CRISIS OF MORALITY AND A CRISIS OF AUTHORITY

Recent Darwin scholarship has established that part of the initial intellectual appeal of Darwinism was that it seemed to undercut the strongest aspect of the polygenist, proslavery argument of the mid-19th century: namely, that the earth and the human species were far more ancient than the Bible appeared to indicate. Where the polygenists reconciled this evidence to an anti-Bibli-

²The scientists who do not exist on Mars are obviously considerably stupider than the scientists who do not exist on Saturn.

³See Godfrey and Marks (1991). Nevertheless, the cultural value in neontological systematics as well is evident in the phenomenon of taxonomic inflation (Isaac et al., 2004; Tattersall, 2007), where the interests of conservation have led to a doubling of the number of primate species over the last generation (Marks, 2007; Strier, 2011).

cal stance, the monogenists (and abolitionists) tended to root their belief in the essential unity of humankind on the authority of Genesis. Darwinism gave the monogenists and abolitionists a naturalistic grounding: all people are indeed of a single common stock, but the common ancestors are African apes of long ago, not Adam and Eve in Eden (Livingstone, 2008; Desmond and Moore, 2009).

Nevertheless, Haeckel (1868/1876) and all the first-generation Darwinians were faced with a problem as they tried to convince their reading public that it was genealogically connected to the apes: namely, the absence of a fossil record documenting that transition. There was an obvious solution to the problem, adopted for example by Huxley while debating Richard Owen about the brain of gorillas, namely that the brains of Africans fall in between those of Europeans and gorillas (Cosans, 2009). Huxley did not write very much about race, however; while Haeckel did, and very explicitly in the context of proving evolution by linking his European reading audience to the apes.

Haeckel (1868/1876) theorized 12 species of living humans, at varying distances from the apes.⁴ He explained (vol 2, pp. 492–493):

If one must draw a sharp boundary between other primates and humans, it has to be drawn between the most highly developed and civilized man on the one hand, and the rudest savages on the other, and the latter have to be classed with the animals. This is, in fact, the opinion of many travelers, who have long watched the lowest human races in their native countries. Thus for example, a great English traveller, who lived for a considerable time on the West Coast of Africa, says: “I consider the negro to be a lower species of man, and cannot make up my mind to look upon him as a man and a brother, for the gorilla would then also have to be admitted in to the family.”

This casual racist talk, of course, is strategic. Haeckel cares more about the relationship of humans to apes than about the relationship of Europeans to Africans. That is the point I wish to highlight in the present context. To convince Europeans about evolution, Haeckel is quite willing to sacrifice the full humanity of the rest of the world.

Here is a question that as far as I know, nobody has ever asked before: Was it worth it? Was winning the rhetorical battle against the creationists so crucial that we could afford to sacrifice the non-white peoples of the world on its front lines, or was that cost too great, leaving us post-Darwinians with an original sin of racism at our birth?

Because if it is the latter, and it is true that—much as we might like to ignore it—our narratives of human evolution are invariably bound up with narratives of human variation (Wolpoff and Caspari, 1997; Jackson, 2001; Proctor, 2003; Derricourt, 2010), and one could reasonably argue that *political and social inequalities are simply more important than whether we came from monkeys*, then we are left with some baggage. That baggage is about scientific authority: Who has it, how you get it, and in particular, who explains the implications of human evolution to the public, whom we presumably want to embrace it, especially if our predecessors did not have such a good track record in the area of social politics.

⁴Quotations are drawn from the English translation supervised by Sir Ray Lankester. I thank a reviewer for noting that in the first German edition of 1868, Haeckel had nine species of humans. In the second German edition of 1870, and all subsequent editions, Haeckel had 12 species of humans, which is what the English translation presents.

After all, Haeckel might only be the tip of the iceberg. In some hands, evolution might not merely dehumanize large groups of people, but might actually rationalize their destruction. In an era of colonialism, an Oxford paleontologist explains, “It is not priority of occupation, but the power to utilize, which establishes a claim to the land. Hence it is a duty which every race owes to itself, and to the human family as well, to cultivate by every possible means its own strength, . . . [lest it incur] a penalty which Natural Selection, the stern but beneficent tyrant of the organic world, will assuredly exact, and that speedily, to the full” (Sollas, 1911: 521). It sounds almost as if he is saying that evolution tells us to kill the native peoples of the world and take their stuff, which does not sound nice at all, a century later.⁵ But the source of the thought—from a high-ranking specialist—gave it authority.

Or from the 1916 best-seller, the *Passing of the Great Race* by Madison Grant:

A rigid system of selection through the elimination of those who are weak or unfit—in other words, social failures, would enable us to get rid of the undesirables who crowd our jails, hospitals, and insane asylums. [Sterilization] . . . can be applied to an ever widening circle of social discards, beginning always with the criminal, the diseased, and the insane, and extending gradually to types which may be called weaklings rather than defectives, and perhaps ultimately to worthless race types (p. 47).

The book, though, was not a work of “pseudoscience.” It was endorsed by the leading human geneticist in America, Charles Davenport (a future president of the American Association of Physical Anthropologists), and came with a preface by the leading spokesman for evolution in America, Henry Fairfield Osborn. Far from being repudiated within the evolution community, Madison Grant spoke for much of it (Fig. 1).

When the second edition of this book was reviewed by a geneticist from MIT in *Science*, it was called not just a “scientific” work, but one “of solid merit” (Woods, 1918). The leading physical anthropologists Hrdlička and Hooton served underneath Grant on the Advisory Board of the American Eugenics Society in the 1920s, along with nearly every geneticist and evolutionary biologist of note in America. Indeed, if Grant had been willing to subsidize *The Yearbook of Physical Anthropology*, he would have sat on its founding editorial board.⁶ And after his scientific book was translated into German, Madison Grant was delighted to receive a fan letter from Adolf Hitler, who found it inspiring (Spiro, 2009).

⁵The German officers in World War I all knew their Haeckel and saw that particular geo-political struggle in fiercely Darwinian terms (Kellogg, 1917), a fact that ultimately helped propel William Jennings Bryan toward his public rejection of evolution (Numbers, 1992; Clark, 2008).

⁶When his effort to coax financial support for the AJPA from Madison Grant failed, Hrdlička solicited a nasty review of *The Passing of the Great Race* from Franz Boas (Hrdlička to Boas, May 6, 1918, Hrdlička Papers, National Anthropological Archives). Boas, who had reviewed the book critically for *The New Republic*, obliged with a short review that ended regretting “that a courteous preface by Prof. H. F. Osborn may convey the impression upon the minds of uninformed readers that the book has merit as a work of science” (Boas, 1918: 363). In the same issue, Hooton (1918: 365) wryly observed, “Only the Prussians and Madison Grant now believe that the Nordics are a race of supermen and archangels.” Nevertheless, Grant’s obituary in *The New York Times* (Anonymous, 1937) noted that the book sold over 16,000 copies domestically and was “a recognized book on anthropology.”

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Fig. 1. Letterhead of the American Eugenics Society, 1926. Above the Advisory Council were Madison Grant and the geneticists Charles Davenport, C. C. Little, and Harry Laughlin. On the diverse Advisory Council were nearly all of the prominent geneticists in America, including Castle of Harvard, Conklin of Princeton, East of Harvard, Guyer of Wisconsin, Holmes of Berkeley, Jennings of Johns Hopkins, Woods of MIT, and Wright of Chicago. Notably absent are Thomas Hunt Morgan, who worked in the same building at Columbia as Franz Boas, an early and outspoken critic of the eugenicists; and Raymond Pearl of Johns Hopkins. The list also includes five of the first eight presidents of the American Association of Physical Anthropologists: Hrdlička, Hooton, Terry, Gregory, and Davenport.

Here is the problem that poses for modern biological anthropologists, who are trying to teach human evolution to our publics. If these experts were right, if evolution really does mandate, or justify, genocidal programs, as Sollas and Grant and their reviewers seemed to think, then we are faced with a moral crisis. Genocide is wrong, and given a choice between genocide and creationism, a reasonable person who cares about social justice ought to reject the ostensible biological imperative to genocide. That is to say, *given a choice between genocide and creationism, the correct answer is creationism.*

If, on the other hand, we agree that evolution does not mandate or imply genocide, and the experts were thoroughly misrepresenting Darwinian and post-Darwinian theory when they said that it does, then we are faced with a problem of authority. If the egghead professors a few decades ago were completely wrong about the meaning of evolution for modern life, then how can we ever be certain that they know what they are talking about now?

CONTINUITY

One of the scientific leaders of the first post-Darwinian generation was Rudolf Virchow, arguably the most important German biologist and anthropologist of the 19th century. According to his 1902 obituary in *Science*, "no one has done more to shape, guide and foster [modern physical anthropology] than Rudolf Virchow" (Boas, 1902). Medical anthropologists recall him more fondly than physical anthropologists, however. We remember him for one thing, in paleoanthropology (and it's not for chairing the congress that adopted a standardized orientation of the human skull, still known as the Frankfurt plane). It is for rejecting the fossil evidence for human evolution, in the forms of Neandertal Man and Java Man (e.g., Shipman, 2001). He was a creationist, and he rejected human evolution; in fact, he ridiculed it.

Virchow's rejection of the fossil evidence for human evolution was nuanced, however, and seeing him in a dualistic framework that pits evolutionism transcen-

dently against creationism may not be adequate to understand his views, for this was not merely the first generation of Darwinism, but the first generation of anthropology as well. The question of the transmutation of species was connected intimately to the meaning of human diversity, that is, to say, to the politics of difference. Where the earliest German anthropologists sought to establish a comparative human science based on the idea that all people are fundamentally cognitively comparable ("the psychic unity of mankind"), the earliest German Darwinists were aggressively dehumanizing non-Europeans in order to connect themselves with the apes (Zimmerman, 2001; Penny and Bunzl, 2003; Marks, 2010). If Haeckel was the primary and fairly authentic German voice of Darwinism (Di Gregorio, 2005; Richards, 2008), then Darwinism was at odds with anthropology, for it undermined the basic assumptions that would make ethnology possible, which Rudolf Virchow, Adolf Bastian, and their like-minded colleagues were trying to establish in Berlin (Köpping, 1983; Baehre, 2008).

This is again what I mean by a crisis of authority. The first generation of German anthropologists, led by Virchow and Bastian, was faced with a fundamental contradiction between their own scientific program and the Darwinian one promoted by Haeckel. So either you challenge the authority of the speaker to speak for Darwinism or you reject the program of Darwinism. It really is not much more complicated than that.

The psychic unity of mankind, of course, presupposes that there is a single kind of people, a single human species. We rarely think about it now, but that was a significantly contested point in biology in second half of the 19th century. On the same side of that issue, the unity of the human species, were Huxley and Virchow; but there were powerful and reputable biologists lined up on the other side, as it were, notably Paul Broca in Paris and Louis Agassiz in Boston. This is also where Haeckel's views lay. In his zeal to emphasize the continuity of human beings with the apes, despite the absence of fossil evidence, Haeckel defined 12 species of living humans,

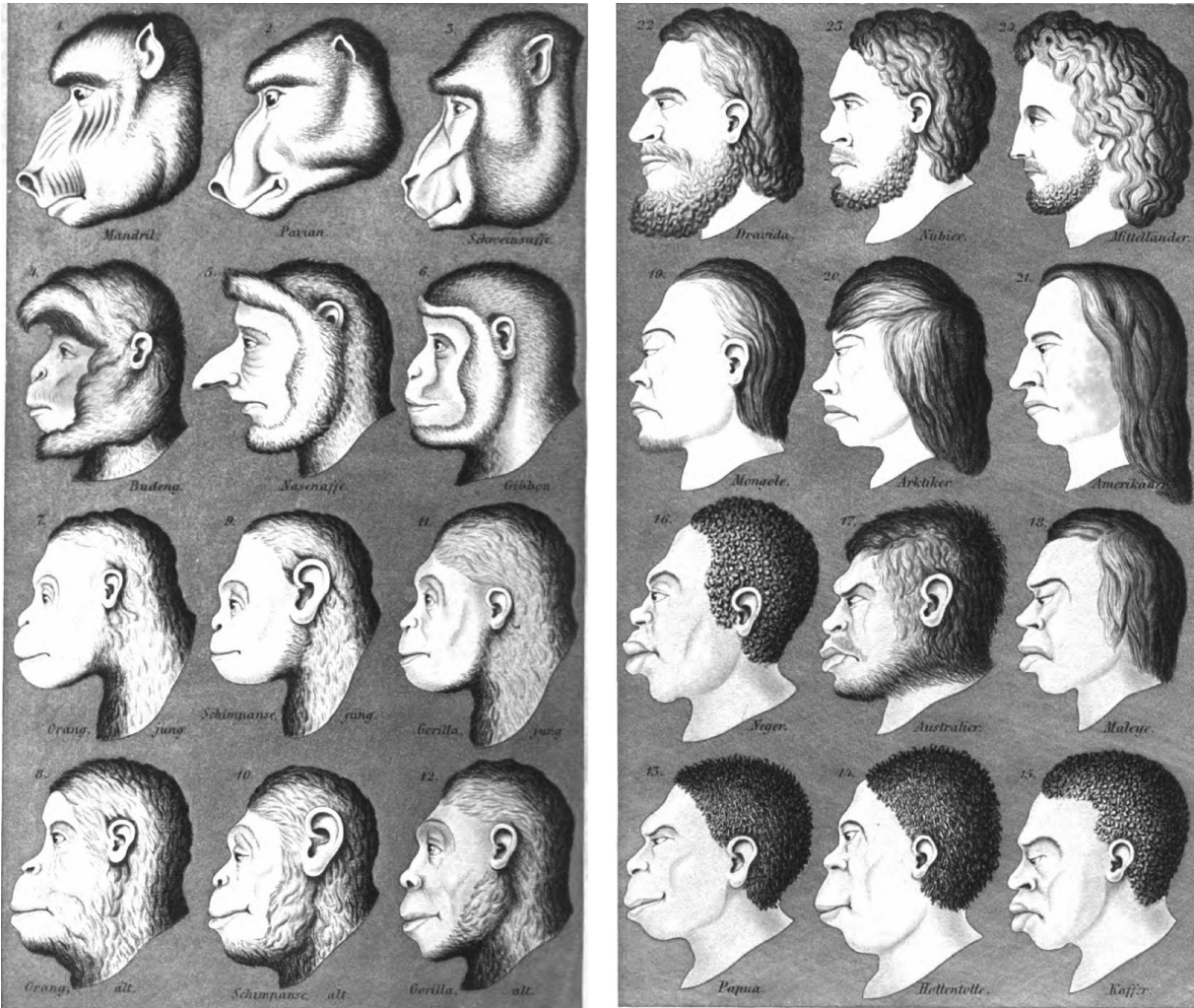


Fig. 2. Plates 13 and 14, from the second German edition of Ernst Haeckel’s *Natürliche Schöpfungsgeschichte* (1870). Haeckel modified it from an even more offensive illustration in the first German edition of 1868, but neither figure appeared in the English translation (Public Domain).

from the ape-like Papuan to the un-ape-like European (Fig. 2).

There was a fundamental disagreement over how anthropology was to be professionalized at the heart of the dispute between the German anthropologists and Darwinians. Not only does the end of Haeckel’s *History of Creation* (1868/1876: 367) somewhat immodestly see itself as fundamentally reforming biology, but it goes on to talk about how evolution will lead to “an important and fruitful reform of anthropology. From this new theory of man, there will be developed a new philosophy, not like most of the airy systems of metaphysical speculation hitherto prevalent, but one founded upon the solid ground of comparative zoology.” That solid ground eventually produced the worst anthropology our science has ever known (Weiss, 1987; Massin, 1996).⁷

The question this raises, though, is why it was different in England, and here I am again going to draw on recent work in the Darwin industry, which centralizes

contemporary anthropological questions. Haeckel (1868/1876) ridiculed the famous line, “Am I not a Man and a Brother?” (see above). Yet that medallion was struck by Darwin’s grandfather, Josiah Wedgwood. The Wedgwoods were ardent abolitionists and so were the Darwinians. Slavery had been abolished by the British while Darwin was in the Galapagos, but, as noted earlier, the fundamental sameness of all peoples was still a debated question, in particular, for first-generation anthropology. With Biblical monogenesis on one side, and mounting scientific evidence for ancient, pre-Biblical ancestors on the other, Darwin gave the abolitionist position a firmer scientific grounding.

Because the political issues were different, the earliest cultural anthropologists in England actually had little trouble reconciling ethnology and Darwinism (Stocking, 1991; Kuper, 2008; Kuklick, 2011). To understand the issues in Victorian England, one begins with the Ethnological Society of London, founded in the 1840s as a bleeding-heart, aboriginal protection and antislavery scientific venue. In 1863, a number of their members stormed off to found the Anthropological Society of London, specifically rejecting the idea of monogenism. After

⁷About a century later, Wilson’s classic *Sociobiology* (1975) would frame its central argument in comparable rhetorical terms.

about 8 years of rival anthropological societies, the nascent community turned to Thomas Huxley to oversee their reconciliation. Huxley was committed, as was Rudolf Virchow, to the unity of the human species, and as the last president of the Ethnological Society in 1871, he oversaw the merger of the two societies, adopting the name “anthropological,” but the monogenist tenets of the older “ethnologicals” (Cunningham, 1908).

To that first generation of anthropology, then, about 1870, in England, Darwinism put you on the political left as social reformers; but in Germany, Darwinism put you on the political right, biologically reifying human groups and dehumanizing much of our species. The point is, though, seeing this with the tunnel-vision of creationism versus evolutionism permits you to miss the more salient issues concerning the relationship of anthropology to evolution and of the relationship of the science of human *ancestry* to the science of human *diversity*. The German anthropologists rejected human evolution largely because of what it seemed to say about people and their program to establish a rigorous basis for the comparison of human groups. The psychic unity of mankind was more important to them than whether or not we came from monkeys. And given a choice between their own methodology and a speculative simian ancestry, they chose the psychic unity.

As Gould (2003) recognized but did not say in quite this way, privileging continuity over discontinuity is an epistemic, not an empirical, issue, because continuity itself is constructed. In particular, the first-generation German Darwinians managed to see continuity—with Africans intermediate between Europeans and apes—where in fact no continuity existed. Our evolutionary relationship to the apes could probably be more usefully seen as one in which continuity and discontinuity coexist in tension with one another; and whose cultural meanings suffuse the data produced on their behalf.⁹ And that brings us to the other assumption, which is really another facet of this dialectic between continuity and discontinuity, namely, the relationship between ancestry and emergence.

ANCESTRY

In 1946, the leading textbook of physical anthropology, Earnest Hooton’s *Up from the Ape*, surveyed the relationships of the anthropoids, incorporating the serological research of various workers, especially Christian von Krogh of Munich, who found that chimpanzees seemed to be serologically more similar to humans than to orangutans. Hooton (1946: 45) told the student quite matter-of-factly, “The weak similarity of the orang to other species suggests a lengthy process of separate development for this animal and its early branching off from the stock of chimpanzee and man.”

This is noteworthy for three reasons. First, histories of molecular anthropology often locate the discovery of this fact in the early 1960s (e.g., Lewin, 1987), rather than being explicitly articulated in the leading introductory text of the preceding generation. Second, the serological facts did not imply to Hooton any need to reclassify

humans, because humans were obviously different from apes. And third, when the fact was rediscovered in the 1960s, it was explicitly linked to an argument for reclassification (Sommer, 2008; Suárez-Díaz and Anaya-Muñoz, 2008; Hagen, 2010).

To evolutionary scholars at mid-century, anyone who could not tell a human from an ape was simply an incompetent biologist (Huxley, 1955; Simpson, 1949, 1963, 1964). To Goodman (1963), however, the intimate genetic ancestry of human and ape implied that humans are indeed apes. This is once again, however, a very culturally loaded inference and bears examining.

To what extent are you reducible to your ancestry? If ape ancestry makes you an ape, does slave ancestry make you a slave? (As noted earlier, questions of human ancestry cannot be so readily divorced from questions of human diversity.)

If we acknowledge instead that identity (what you are) involves a constant tension between what you *were* (ancestry) and what you *have become* (emergence), then we can see more clearly the cultural premises underlying the polar positions. To the mid-century synthetic theorists, like Simpson, descendants can be different from ancestors—indeed, that was how they defined evolution, as Darwin’s “descent with modification.” To call us apes on the basis of our ancestry, then, would be effectively to redefine evolution as descent *without* modification, that is to say, as simply descent. What is interesting about evolution, on the other hand, is how we became *not*-apes—that is, the very “modification” that the geneticists apparently wished to bury. To these mid-century “holistic” evolutionary scholars, humans are not apes; humans are ex-apes.

In fact, this cultural question—Are you just your ancestors?—had been at the center of biological disputes before. In a society governed by ancient hereditary aristocracies, in which one’s place in life is determined in large part by one’s ancestry, the relationship between you and your ancestors carries considerable cultural salience. Consider the argument in the late-1800s between the adherents of August Weismann’s “continuity of the germ-plasm” (in which your body is disconnected from your reproductive cells, which alone form the basis of the next generation, thus creating an unbroken cellular chain linking ancestors to descendants) and their antagonists, the neo-Lamarckians (who maintained that circumstances could indeed profoundly affect the lives of descendants). In every generation, the neo-Lamarckians appear to be routed, and yet they keep coming back. Why? Because changing circumstances *do* affect the lives of descendants profoundly, and you are not simply a reconstitution of your ancestors’ germ cells.

You are quite different from your ancestors and you lead a profoundly different life from theirs. But not for genetic reasons, of course—for reasons that are, for all intents and purposes, entirely cultural–historical.¹⁰ Furthermore, the number of equally contributing genetic ancestors increases exponentially with each retreating generation; ancestry is only a “line” culturally (Ingold, 2007). This ought to imply that genetics and life course

⁹This may also be familiar to veterans of debates with creationists, who point to a “gap” in the human fossil record, and when confronted with a “transitional” fossil inhabiting the gap, subsequently point to the two gaps now on either side of it.

¹⁰Obviously, there are conceivable exceptions. If you have sickle-cell anemia, it is certainly possible that many of your ancestors did not have it, and, consequently, the difference between your life and theirs has a real genetic aspect. Even so, their lives and yours still differ profoundly in cultural ways.

do not map particularly well onto one another and that the former generally does not contribute very much to the latter. Nevertheless, Weismann's ideas had a considerable synergy with the conservative strain of European politics that was trying to stave off the upwardly mobile bourgeoisie, who threatened the dominance of the ancient aristocracy (MacKenzie, 1976; Weiss, 1987; Johnston, 1995; Slavet, 2009). The message that the germ plasm is all that matters and that your body is merely a temporary vessel for the immortal germ cells, which determine, or at least severely constrain, the development of the self in every generation, almost begs to be infused with race. And by an interesting confluence of ideas, this is just about the same time that de Gobineau's *On the Inequality of the Human Races* (1853/1915), widely regarded as the foundational document of modern scientific racism, became widely available.

On the other side of the political and biological spectrum, there is the attraction to nongenetic modes of change, how people can remake themselves differently from their ancestors, ranging from culture to the inheritance of acquired characteristics. The inventor of culture, Tylor (1871: 410), was a Quaker who considered anthropology to be "a reformer's science" by virtue of the liberating aspect of culture "in aiding progress and in removing hindrance." And the most infamous Lamarckians, Paul Kammerer and Trofim Lysenko, were both favorites of the Soviet Union (Graham, 1977). Perhaps even more interesting is the extent to which the study of nongenetic change has been associated (by their opponents) with those quintessential chameleons and assimilators, the Jews (Gliboff, 2006; Lipphardt, 2008).¹¹

The point is, as unpolitical as these biological issues may seem, they were in fact highly political. The politicians who believed that ancestry was the most important thing about you, and the scientists who believed that ancestry was the most important thing about you, were never entirely independent of one another.

Which brings us back to the question we posed several paragraphs ago: Are you just your ancestors? No, you are not just your ancestors. And anyone who says you are is obliged to defend it as a proposition of science and of political ideology, for it is both. Are you biologically an ape? Paleontologist G. G. Simpson said monosyllabically in his authoritative work, *The Meaning of Evolution* (1949: 283), "It is not a fact that man is an ape." Six decades later, geneticist Jerry Coyne says in his authoritative *Why Evolution is True* (2009: 192) that the opposite proposition is an "indisputable fact." What intervened to make the nonfact that humans are apes into a fact? The answer, I think, was the Human Genome Project.

It has long been observed that the Human Genome Project brought a centrality and grandiosity to the study of human DNA that had not previously been fully realized. Around 1990, the gene came to be seen as "a cultural icon," in the well-known phrase of the sociologist Dorothy Nelkin and historian Susan Lindee (1995). Preceding the federal investment in genomics came a scientifically tolerable overstatement of the significance of the

genome—now seen retrospectively as "hype" (Holtzman, 1999; Brown, 2003). Nevertheless, we have had 20 years of genohype; no wonder people believe it. Thus, what was once seen by the synthetic theorists in the 1960s as a radical, preposterous, ignorant, and vulgarly self-interested proposition—that genetically humans are apes and therefore humans are apes (Goodman, 1963; Zuckerkandl, 1963)—could be placed at the heart of a science best seller in 1992, and be taken for granted, even by sophisticated evolutionary thinkers, by 2009. But we were not always apes; we *became* apes as a consequence of the cultural privilege accorded to genetic data and approaches at the end of the 20th century. We became apes as a dialectical relationship of descent and modification became replaced by a reductive view, in which descent (which genetics reveals well) supersedes modification (which genetics does not reveal well).¹²

The genetic apeness of people also meshed well with the phylogenetic focus of cladistics, and provided a useful tool with which to bludgeon the creationists; but its truth value is predicated on the acceptance of genetic relationships as transcendent and the suppression of their ecological relationships. Whether you choose to see us, then, as genetic apes or as ecological ex-apes is not so much a scientific issue as an ideological one. Both identities are true (Marks, 2009b). The question is: Which identity do you wish to highlight? I will simply observe that one of those species is driving all the others to extinction and that is an important biological fact—and perhaps even more important to acknowledge presently than their relationships of ancestry.¹³

CONCLUSIONS

Various ideologies help construct our scientific understanding of ourselves. Landau (1991) famously explored the relationship between paleoanthropological explanations and hero myths. Obviously, there is a biohistorical reality somewhere, but we are invariably constrained by the cultural intellectual tools at our disposal to identify, to comprehend, and to articulate that reality.

Let me end, then, with the two false ideologies that still bedevil our discipline: scientific racism and unscientific creationism. Sadly, scientific racism is with us, but in new guises, not unlike hydra-headed creationism. Nevertheless, scientific racism is a product of science and is therefore a bigger threat to science than creationism is, because it is only scientists who can make science look bad. And although you will not find many mainstream biologists who will stand up and cheerlead for scientific racism, it is an odd fact that you can have a career in science as a racist, but not as a creationist. If you promote racist ideologies, you may face some hostility from those lefty commie Marxist postmodernist do-gooders, as the Nobel laureates William Shockley (Plotz,

¹¹This was casually noted by the psychologist MacBride (1924: 600), reviewing a German human genetics text: "[W]e find Dr. Lenz solemnly stating that one characteristic of the Jewish race is a tendency to Lamarckian views because this doctrine holds out the hope that the differences between races can be done away with (a statement which is a libel on the valued and respected members of that race who belong to our society)."

¹²Genetics does not reveal the "modification" well because of the unclear relationship between genome and body. We have units of the genome, and we have units of the body, but they do not map on to one another; that is, to say, we have "genes" and we have "elbows," but we do not have "elbow genes."

¹³It is also true that calling us "apes" seems to provide another weapon with which to bludgeon the creationists. However, as I think we ought to glean from the examples of Ernst Haeckel and from Henry Fairfield Osborn (Clark, 2008), it is probably a bad idea to become so preoccupied with the creationists that you end up letting them dictate the scientific agenda and end up supporting Darwinism rhetorically with falsehoods and inanities.

2005; Shurkin, 2008) and James Watson (Hunt-Grubbe, 2007) learned. But if you promote creationist ideologies, you are excommunicated and defined as outside the boundaries of science. You effectively cannot have a career in science as a creationist, but you can as a racist. Somehow that strikes me as wrong. It should be just as unacceptable in science to be a racist as it is to be a creationist.

Unfortunately, there is also a great deal of misunderstanding about creationists and a surprising dearth of contemporary ethnographic information on them (Marks, 2011). As noted earlier, some science deserves to be rejected—if nothing else, the history of our field shows that. Consequently, the problem with creationists is not that they reject science, but that they reject science that they should not be rejecting. Creationism is not an instantiation of a broad populist rejection of science, as hack cultural analyses sometimes have it. Creationism is the rejection of a specific bit of science, a science that today sometimes tethers itself to racism (Rushton, 1995; Watson, 2007) or atheism (Dawkins, 2006), and in the past has bound itself to worse things, like genocide (see above) and the widespread suppression of human rights. It was indeed the white supremacist eugenics, presented casually alongside evolution in Hunter's *Civic Biology*—the textbook at the center of the Scopes Trial in 1925—that led Darrow (1925, 1926) to attack eugenics immediately after the trial, yet still before any American biologist would go on record against it.¹⁴ Darrow evolved in 1926, with only a slightly altered focus, from American biology's greatest defender to its greatest basher. Interestingly, a few years earlier, Darrow's infamous antagonist in the Scopes Trial had publicly and appropriately doubted the sexist invocation of sexual selection, but from the creationist side of the fence: "Darwin explains that man's mind became superior to woman's because, among our brute ancestors, the males fought for the females and thus strengthened their minds. If he had lived until now, he would not have felt it necessary to make so ridiculous an explanation, because woman's mind is not now believed to be inferior to man's" (Bryan, 1922).

So, the issue should not be, how do we make everybody believe what they are told in the name of science? But rather, how do we make wise distinctions within the corpus of science to gauge what we should and should not make everybody believe? That is, to a large extent, the point Rudolf Virchow was making when he repudiated Haeckel's vision of the theory of descent from the apes. What actually ought to count as science, when the field is political and moral as well as biological? This is the question that has come up every generation and has never been satisfactorily resolved.

Obviously, I have not resolved it, but I hope that I have convinced you that a broad historical, anthropological, "science-studies" approach to science—our own science—may offer useful insights into how we make our knowledge and how most effectively to communicate our knowledge to others.

¹⁴Darrow's attack on the eugenicists was published by H. L. Mencken in his literary magazine, *The American Mercury*. The following year, Mencken's friend, and future AAPA President Raymond Pearl (1927) would publish his salvo against the eugenics movement—the first by an American biologist—in the same venue.

LITERATURE CITED

- Abu el-Haj, N. 2001. *Facts on the ground*. Chicago: University of Chicago Press.
- Anonymous. 1937. Madison Grant, 71, zoologist, is dead. *Head of New York Zoological Society since 1925 sponsored the Bronx River Parkway. Saved the redwood trees. Discovered many mammals while exploring American frontier*—wrote several books. *The New York Times*, May 31.
- Arnold M. 2009. *Reticulate evolution and humans: origins and ecology*. New York: Oxford University Press.
- Baehre R. 2008. Early anthropological discourse on the Inuit and the influence of Virchow on Boas. *Inuit Stud* 32:13–34.
- Boas F. 1902. Rudolf Virchow's anthropological work. *Science* 16:441–445.
- Boas F. 1918. Peoples at war. *Am J Phys Anthropol* 1:363.
- Brown N. 2003. Hope against hype: accountability in biopasts, presents and futures. *Sci Stud* 16:3–21.
- Bryan WJ. 1922. God and evolution. *The New York Times*, 26 February.
- Clark CA. 2008. *God—or gorilla: images of evolution in the jazz age*. Baltimore: Johns Hopkins University Press.
- Coon CS. 1968. Comment on "Bogus Science." *J Hered* 59:275.
- Corbey R. 2005. *The metaphysics of apes: negotiating the animal-human boundary*. New York: Cambridge University Press.
- Cosans C. 2009. *Owen's ape and Darwin's bulldog: beyond darwinism and creationism*. Bloomington, IN: Indiana University Press.
- Coyne JA. 2009. *Why evolution is true?* New York: Viking.
- Cunningham D. 1908. Anthropology in the eighteenth century. *J R Anthropol Inst Great Britain Ireland* 38:10–35.
- Darrow C. 1925. The Edwardses and the Jukeses. *Am Mercury* 6:147–157.
- Darrow C. 1926. The eugenics cult. *Am Mercury* 8:129–137.
- Dawkins R. 2006. *The God Delusion*. New York: Bantam.
- de Gobineau A. 1853/ 1915. *The inequality of human races*. New York: GP Putnam's Sons. (Originally published as *Essai sur l'Inégalité des Races Humaines*. Paris: Firmin Didot Frères).
- Derricourt R. 2010. Raymond Dart and the danger of mentors. *Antiquity* 84:230–235.
- Desmond A, Moore J. 2009. *Darwin's sacred cause: how a hatred of slavery shaped Darwin's views on human evolution*. New York: Houghton Mifflin Harcourt.
- Diamond J. 1992. *The Third Chimpanzee*. New York: Harper-Collins.
- Di Gregorio MA. 2005. *From here to eternity: Ernst Haeckel and scientific faith*. Dordrecht: Vandenhoeck & Ruprecht.
- Dupré J. 1993. *The disorder of things: metaphysical foundations of the disunity of science*. Cambridge, MA: Harvard University Press.
- Eldredge N, Tattersall I. 1982. *The myths of human evolution*. New York: Columbia University Press. p 223–224.
- Feyerabend P. 1975. *Against method*. London: Verso.
- Gliboff S. 2006. The case of Paul Kammerer: evolution and experimentation in the early 20th century. *J History Biol* 39:525–563.
- Godfrey LR, Marks J. 1991. The nature and origins of primate species. *Yearb Phys Anthropol* 34:39–68.
- Goldacre B. 2009. *Bad science*. London: Harper Perennial.
- Goodman AH, Heath D, Lindee MS, editors. 2003. *Genetic nature/culture: anthropology and science beyond the two-culture divide*. Berkeley, CA: University of California Press.
- Goodman M. 1963. Man's place in the phylogeny of the primates as reflected in serum proteins. In: Washburn SL, editor. *Classification and human evolution*. Chicago: Aldine. p 204–234.
- Gould SJ. 2003. *The structure of evolutionary theory*. Cambridge, MA: Harvard University Press.
- Graham LR. 1977. Science and values: The eugenics movement in Germany and Russia in the 1920s. *The Am Hist Rev* 82:1133–1164.
- Haeckel E. 1868/ 1876. *The history of creation: or the development of the earth and its inhabitants by the action of natural causes*, translated by E. R. Lankester. New York: D. Appleton.

- (Originally published as *Natürliche Schöpfungsgeschichte*, Berlin: Reimer).
- Hagen JB. 2010. Waiting for sequences: Morris Goodman, immunodiffusion experiments, and the origins of molecular anthropology. *J History Biol* 43:697–725.
- Holtzman NA. 1999. Are genetic tests adequately regulated? *Science* 286:409.
- Hooton EA. 1918. Peoples at war. *Am J Phys Anthropol* 1:363–366.
- Hooton EA. 1946. *Up from the ape*, 2nd ed. New York: Macmillan.
- Hulse FS. 1962. Race as an evolutionary episode. *Am Anthropol* 64:929–945.
- Hunt-Grubbe C. 2007. The elementary DNA of Dr. Watson. *The Sunday Times* (London) 14 October.
- Huxley JS. 1955. Guest editorial: evolution, cultural and biological. *Yearb Anthropol* 144:215–217.
- Huxley T. 1863. *Man's place in nature*. London: Williams and Norgate.
- Ingold T. 2007. *Lines: a brief history*. London: Routledge.
- Isaac NJB, Mallet J, Mace GM. 2004. Taxonomic inflation: its influence on macroecology and conservation. *Trends Ecol Evol* 19:464–469.
- Jackson JJ, Jr. 2001. “In ways unacademical”: the reception of Carleton S. Coon's *The Origin of Races*. *J History Biol* 34:247–285.
- Johnston TD. 1995. The influence of Weismann's germ-plasm theory on the distinction between learned and innate behavior. *J History Behav Sci* 31:115–128.
- Kellogg V. 1917. *Headquarters nights*. Boston: The Atlantic Monthly Press.
- Koenig BA, Lee SS-J, Richardson S, editors. 2008. *Revisiting race in a Genomic age*. Piscataway, NJ: Rutgers University Press.
- Köpping K. 1983. *Adolf Bastian and the psychic unity of mankind*. St. Lucia: University of Queensland Press.
- Kuklick H. 2011. The theory of evolution and cultural anthropology. In: Fasolo A, editor. *The theory of evolution and its impact*. New York: Springer. pp 83–102.
- Kuper A. 2008. Changing the subject-about cousin marriage, among other things. *J Roy Anthropol Inst* 14:717–735.
- Landau M. 1984. Human evolution as narrative. *Am Sci* 72:262–268.
- Landau M. 1991. *Narratives of human evolution*. New Haven: Yale University Press.
- Lewin R. 1987. *Bones of contention: controversies in the search for human origins*. New York: Simon & Schuster.
- Lipphardt V. 2008. *Biologie der Juden. Jüdische Wissenschaftler über “Rasse” und Vererbung, 1900-1935*. Göttingen: Vandenhoeck & Ruprecht.
- Little MA, Sussman RW. 2010. History of biological anthropology. In: Larsen CS, editor. *A companion to biological anthropology*. New York: Wiley. p 13–38.
- Livingstone DN. 1984. *Darwin's forgotten defenders: the encounter between evangelical theology and evolutionary thought*. Vancouver: Regent College Publications.
- Livingstone DN. 2008. *Adam's ancestors: race, religion, and the politics of human origins*. Baltimore: Johns Hopkins.
- MacBride E. 1924. [Review of] *Grundriss der menschlichen erblichkeitslehre* ed. II. Vol. I, by E. Baur, E. Fischer, and F. Lenz. *Eugen Rev* 15:600.
- MacKenzie D. 1976. Eugenics in Britain. *Social studies of science* 6:499–532.
- Malinowski B. 1925. Magic, religion, and science. In: Needham J, editor. *Science, religion, and reality*. New York: Macmillan. p 19–84.
- Malinowski B. 1935. *Coral gardens and their magic*. London: Allen & Unwin.
- Marks J. 2007. Anthropological taxonomy as both subject and object: the consequences of descent from Darwin and Durkheim. *Anthropol Today* 23:7–12.
- Marks J. 2009a. *Why I am not a scientist: anthropology and modern knowledge*. Berkeley, CA: University of California Press.
- Marks J. 2009b. What is the viewpoint of hemoglobin, and does it matter? *History Philos Life Sci* 31:239–260.
- Marks J. 2010. Why were the first anthropologists creationists? *Evolut Anthropol* 19:222–226.
- Marks J. 2011. Applied anthropology anyone? *Anthropol Today* 27:3–4.
- Marks J. 2012. Evolutionary ideologies. In: Poiani A, editor. *Pragmatic evolution: applications of evolutionary theory*. New York: Cambridge University Press. p 297–312.
- Massin B. 1996. From Virchow to Fischer: physical anthropology and “modern race theories” in Wilhelmine Germany. In: Stocking G, editor. *Volksgeist as method and ethic: essays on Boasian ethnography and the German anthropological tradition*. Madison: University of Wisconsin Press. p 79–154.
- Mencken HL. 1956. *Minority report: H. L. Mencken's notebooks*. New York: Knopf.
- Nelkin D, Lindee MS. 1995. *The DNA mystique. The gene as a cultural icon*. New York: Freeman.
- Numbers RL. 1992. *The creationists*. New York: Knopf.
- Osborn HF. 1926. The evolution of human races. *Nat History* 26:3–13.
- Pearl R. 1927. The biology of superiority. *Am Mercury* 12:257–266.
- Penny H, Bunzl M, editors. 2003. *Worldly provincialism: German anthropology in the age of empire*. Ann Arbor, MI: University of Michigan Press.
- Plotz D. 2005. *The genius factory: the curious history of the Nobel Prize Sperm Bank*. New York: Random House.
- Proctor RN. 2003. Three roots of human recency: molecular anthropology, the refigured Acheulean, and the UNESCO response to Auschwitz. *Curr Anthropol* 44:213–239.
- Richards R. 2008. *The tragic sense of life: Ernst Haeckel and the struggle over evolutionary thought*. Chicago: University Of Chicago Press.
- Robbins RH, Cohen MN, editors. 2009. *Darwin and the Bible: the cultural confrontation*. Boston, MA: Pearson Education.
- Rosoff P. 2010. In search of the mommy gene: truth and consequences in behavioral genetics. *Sci Technol Hum Values* 35:200–243.
- Rushton J. 1995. *Race, evolution, and behavior*. New Brunswick, NJ: Transaction.
- Shipman P. 2001. *The man who found the missing link: Eugène Dubois and his lifelong quest to prove Darwin right*. New York: Simon and Schuster.
- Shurkin JN. 2008. *Broken genius: the rise and fall of William Shockley, creator of the electronic age*. New York: Palgrave Macmillan.
- Simpson GG. 1949. *The meaning of evolution*. New Haven: Yale University Press.
- Simpson GG. 1963. The meaning of taxonomic statements. In: Washburn SL, editor. *Classification and human evolution*. Chicago: Aldine. p 1–31.
- Simpson GG. 1964. Organisms and molecules in evolution. *Science* 146:1535–1538.
- Slavet E. 2009. Freud's Lamarckism and the politics of racial science. *J History Biol* 41:37–80.
- Sollas WJ. 1911. *Ancient hunters and their modern representatives*. London: Macmillan.
- Sommer M. 2008. History in the gene: negotiations between molecular and organismal anthropology. *J History Biol* 41:473–528.
- Spiro J. 2009. *Defending the master race: conservation, eugenics, and the legacy of Madison grant*. Burlington, VT: University Press of Vermont.
- Stocking GW. 1991. *Victorian anthropology*. New York: Free Press.
- Stoczkowski W. 2002. *Explaining human origins: myth, imagination and conjecture*. New York: Cambridge University Press.
- Strier KB. 2011. *Primate behavioral ecology*, 4th ed. Upper Saddle River, NJ: Prentice Hall.
- Strum S, Fedigan L, editors. 2000. *Primate encounters: models of science, gender, and society*. Chicago: University of Chicago Press.
- Suárez-Díaz E, Anaya-Muñoz V. 2008. History, objectivity, and the construction of molecular phylogenies. *Stud History Philos Biol Biomed Sci* 39:451–468.

- Tattersall I. 2007. Madagascar's Lemurs: cryptic diversity or taxonomic inflation? *Evolut Anthropol* 16:12–23.
- Tucker WH. 2002. *The funding of scientific racism: Wickliffe Draper and the pioneer fund*. Urbana, IL: University of Illinois Press.
- Tylor EB. 1871. *Primitive culture*, Vol. II. London: John Murray.
- Washburn SL. 1978. Human behavior and the behavior of other animals. *Am Psychol* 33:405–418.
- Watson J. 2007. *Avoid boring people*. New York: Alfred A. Knopf.
- Weiss SF. 1987. The race hygiene movement in Germany. *Osiris* 2:193–236.
- Wilson EO. 1975. *Sociobiology: the new synthesis*. Cambridge, MA: Harvard University Press.
- Wolpoff MH, Caspari R. 1997. *Race and human evolution: A fatal attraction*. New York: Simon & Schuster.
- Wolpoff MH, Caspari R. 2000. The many species of humanity. *Anthropol Rev* 63:3–17.
- Woods FA. 1918. The passing of the great race, 2d ed. (Review). *Science* 48:419–420.
- Woolgar S, editor. 1988. *Knowledge and reflexivity*. London: Sage.
- Zerubavel E. 2012. *Ancestors and relatives*. New York: Oxford University Press.
- Zimmerman A. 2001. *Anthropology and antihumanism in imperial Germany*. Chicago: University of Chicago Press.
- Zuckermandl E. 1963. Perspectives in molecular anthropology. In: Washburn SL, editor. *Classification and human evolution*. Chicago: Aldine. p 243–272.