

# The Ascent of Man and the Politics of Humanity's Evolutionary Future

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**Throughout the twentieth century, contemporary understandings of evolutionary theory were tightly linked to visions of the future freighted with moral consequence. This essay traces the origins and legacy of this scientific commitment to a universal family of man in postwar evolutionary theory, and elaborates how evolutionary scientists sought to reframe the politics of human evolution by claiming that the principles governing the physical past of humanity differed fundamentally from those that would matter in the coming decades, centuries, or even millennia. Education and public engagement embodied the moral importance of actively participating in the creation of that better, future world.**

In 1962, twenty-seven men of science gathered in London to discuss “Man and His Future.” Biologists of various stripes, including geneticists, molecular biologists, agriculturalists, zoologists, and biochemists, exchanged their visions of the future. The conference, and the volume it spawned, spoke to a common nervousness about the new nuclear age in which they lived, regardless of whether we might now classify their political perspectives as conservative, liberal, or socialist. One reviewer of the published proceedings found the volume fascinating, provocative, and “fun to ‘listen’ to, especially when they are having at one another with verbal broadswords.”<sup>1</sup>

Underpinning these varied visions of the future were different answers to questions like, do all humans share a common nature? and if so then, what makes us human? Definitions of a universal human nature acquired particular potency after the Second World War as American biologists and anthropologists struggled to make sense of the violence they had witnessed in the previous decade and continued to see around them. Even if they did not study humanity directly, the rhetoric of universal evolutionary principles allowed experts on the behavior of birds, the genetics of fruit flies and plants, even the paleontological history of non-human animals to assert their authority as potential experts on human nature with professional standing equal to that of anthropologists who did take humanity as their special realm of expertise. These scientists invested themselves with

the responsibility to use their professional positions to correct ostensibly popular misunderstandings about human nature, wrest the legacy of evolution from any association with eugenics, and construct a public vision of an equitable world for all peoples.<sup>2</sup> Establishing a universal human nature that distinguished us from other animals thus became an intellectual project invested with moral import.

This essay traces the origins and legacy of this scientific commitment to a universal family of man in postwar evolutionary theory, and elaborates how scientists—including population geneticist Theodosius Dobzhansky, biologist J. B. S. Haldane, ethologist and statesman of science Julian Huxley, and paleontologist George Gaylord Simpson—sought to reframe the politics of human evolution by claiming that the principles governing the physical past of humanity differed fundamentally from those that would matter in the coming decades, centuries, or even millennia. They argued that when humans became human, a new form of evolutionary process came into being. Our capacity for culture, language, and ability to manufacture complex technologies, signaled a pronounced break with the past and necessitated a new set of conceptual, scientific tools for thinking about humanity's possible evolutionary futures.<sup>3</sup> Whether they called it cultural, creative, or social evolution, liberal scientists endowed humanity's escape from our physical past with hope and self-determination. Even their book titles sparkled with promise, from Dobzhansky's *The Biological Basis of Human Freedom* to Jacob Bronowski's *The Ascent of Man*.<sup>4</sup>

Scientific understandings of human evolution thus entailed visions of our possible futures. Throughout the twentieth century, contemporary understandings of evolutionary theory were tightly linked to visions of the future freighted with moral consequence. We can sort changes in

<sup>2</sup> Vassiliki Betty Smocovitis, “Humanizing Evolution: Anthropology, the Evolutionary Synthesis, and the Prehistory of Biological Anthropology, 1927–1962,” *Current Anthropology* 53, no. S5 (2012): S108–S125; Tracy Teslow, *Constructing Race: The Science of Bodies and Cultures in American Anthropology* (New York: Cambridge University Press, 2014). Literary figures, too, wrestled with these fundamental questions, see Mark Greif, *The Age of the Crisis of Man: Thought and Fiction in America, 1933–1973* (Princeton: Princeton University Press, 2015).

<sup>3</sup> Reinhart Koselleck, *Futures Past: On the Semantics of Historical Time*, trans. Keith Tribe (Cambridge, MA: MIT Press, 1985); James Secord, *Visions of Science: Books and Readers at the Dawn of the Victorian Age* (Chicago: University of Chicago Press, 2015).

<sup>4</sup> Theodosius Dobzhansky, *The Biological Basis of Human Freedom* (New York: Columbia University Press, 1956); Jacob Bronowski, *Ascent of Man* (Boston: Little, Brown, 1973).

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<sup>1</sup> Louis Lasagna, “Man and His Future. Ciba Foundation Volume. Gordon Wolstenholme,” *The Quarterly Review of Biology* 40, no. 2 (1965): 229; Gordon Wolstenholme, ed., *Man and His Future* (Boston: Little, Brown, & Company, 1963).

Available online 20 November 2016

this relationship into three loose historical phases. In the first decades of the century, a simplistic application of Darwinian principles to human evolution led eugenicists to imagine controlling humanity's future in ways that reinforced contemporary prejudices—especially the idea that races differed constitutionally from each other. After the Second World War and deeply embedded in the American struggle for Civil Rights, scientists reacting against eugenic theories imagined a plurality of progressive futures for humanity as a unified whole.<sup>5</sup> Finally, Cold War technological fears intervened, presenting instead a vision of humanity unprepared to face the challenges of rapid technological proliferation. Thus, by the end of the 1970s, hopeful visions of human nature came increasingly under fire from across the political spectrum as scientists and laypeople alike questioned whether a long future for humanity could be realized.<sup>6</sup>

In each phase, scientists renewed their commitment to communicating knowledge of humanity's past and theories of its future to the reading public. Their conceptions of human evolution were, time and again, tied to the politics of the era in which they lived, thought, and wrote. In tracing this history, this essay reveals the future's irresistible lure and inescapable moral implications for postwar evolutionary scientists.

### Eugenic Natures

To understand later transformations in biologists' conception of humanity's past and future, we must begin before the Second World War. Eugenics movements across the world arguably constituted one of the most public manifestations of the rising authority of biomedicine in the first decades of the twentieth century.<sup>7</sup> As eugenicists appropriated evolutionary and genetic language (if not the intricacies of the logic, theories, and data that created them), "mate choice," often articulated as marriage choice, served as a powerful tool in which eugenicists sought to craft their biological futures. Women's choice in husbands—separated from the chains of economic necessity—and men's choice in wives could lead to healthier, more numerous babies with the right attributes and thus ensure the biological

future of the race (however defined). Eugenic conceptions of health and Christian bodily cultures also emphasized connections between physical fitness, mental acuity, and promising futures.<sup>8</sup>

In the 1920s, entomologist Vernon Kellogg wrote that for the layman, "evolution" meant *human* evolution and even professional biologists, he suggested, were "more interested in humankind than in any other kind of creature."<sup>9</sup> As a consequence, he noted three important things that the biologist and reader alike should keep in mind. First, Kellogg enumerated, the future of humanity fundamentally depended on different causal factors—one biological and one societal. Second, the biological evolution of humanity could be largely directed through societal evolution. Third, societal evolution, and therefore the future of humanity, depended on the decisions and efforts of the present.<sup>10</sup> For Julian Huxley—then working in the zoology department at Oxford University—the key to the future of human evolution similarly lay in processes like mate selection that could be governed by "true or conscious purpose" rather than unconscious factors like "survival and the production of offspring," which had been so important during pre-human evolution.<sup>11</sup> Speaking before the Society for Sex Psychology in October of 1922 about the evolution of human courtship, Huxley described the development within a variety of "higher animals" of a connection between the "sex instinct," emotional reactions induced by members of the opposite sex, and the perception of beauty. From there, he speculated, evolved so much of the natural splendor we observe in the organic world. Huxley asserted that the "mind has thus been the sieve through which variations in courtship characters must pass if they are to survive."<sup>12</sup> In humans, these associations had been strengthened through the complex mental life of individual people.<sup>13</sup> This gave humans, by means of conscious purpose, the power to enact new values in devising methods for ensuring the future progress of society and improve upon the "dilatatory," "wasteful," and "cruel" methods of natural selection.<sup>14</sup>

This idea had a long tradition. Even Charles Darwin, in *On the Origin of Species*, had drawn his readers' attentions to the mating behavior of animals by distinguishing between natural and sexual selection.<sup>15</sup> Sexual selection, he

<sup>5</sup> On ideas of progress in evolutionary theory, start with Peter Bowler, *The Invention of Progress: The Victorians and the Past* (Cambridge, MA: B. Blackwell, 1989), Matthew Nitecki, ed., *Evolutionary Progress* (Chicago: University of Chicago Press, 1988), Robert J. Richards, *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior* (Chicago: University of Chicago Press, 1987), Michael Ruse, *Monad to Man: The Concept of Progress in Evolutionary Biology* (Cambridge, MA: Harvard University Press, 1996), and Vassiliki Betty Smocovitis, *Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology* (Princeton, NJ: Princeton University Press, 1996).

<sup>6</sup> The decline of arguments for an evolutionarily-grounded progressive future resonates with the rise of "human rights" discourse in the 1970s; Samuel Moyn, *The Last Utopia: Human Rights in History* (Cambridge, MA: Harvard University Press, 2012). See, too, Donna Haraway's periodization in *Modest-Witness@Second-Millennium.FemaleMan-Meets-OncoMouse: Feminism and Technoscience* (New York: Routledge, 1997), 219–229, and Marianne Sommer's tripartite division of *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2016).

<sup>7</sup> Nathaniel Comfort, *The Science of Human Perfection: How Genes Became the Heart of American Medicine* (New Haven, CT: Yale University Press, 2012), Daniel Kevles, *In the Name of Eugenics: Genetics and the Uses of Human Heredity* (New York: Alfred A. Knopf, Inc., 1985), Susan Lindee and Dorothy Nelkin, *The DNA Mystique: The Gene as a Cultural Icon* (New York: W. H. Freeman and Company, 1995), Staffan Müller-Wille and Hans-Jörg Rheinberger, *A Cultural History of Heredity* (Chicago: University of Chicago Press, 2012), and Diane Paul, *The Politics of Heredity: Essays on Eugenics, Biomedicine, and the Nature-Nurture Debate* (Albany: SUNY Press, 1998).

<sup>8</sup> R. Marie Griffith, *Born Again Bodies: Flesh and Spirit in American Christianity* (Berkeley: University of California Press, 2004); John Hoberman, *Testosterone Dreams: Rejuvenation, Aphrodisia, Doping* (Berkeley: University of California Press, 2005); Laura Lovett, *Conceiving the Future: Pronatalism, Reproduction, and the Family in the United States* (Chapel Hill: University of North Carolina Press, 2007).

<sup>9</sup> Vernon Kellogg, *Evolution: The Way of Man* (New York: D. Appleton and Company, 1925), 218. See Mark Largent, "Bionomics: Vernon Kellogg and the Defense of Darwinism," *Journal of the History of Biology* 32, no. 3 (1999): 465–88.

<sup>10</sup> Vernon Kellogg, *Evolution: The Way of Man* (New York: D. Appleton and Company, 1925), 218. See Mark Largent, "Bionomics: Vernon Kellogg and the Defense of Darwinism," *Journal of the History of Biology* 32, no. 3 (1999): 278.

<sup>11</sup> Julian Huxley, "Preface," in *Essays of a Biologist* (New York: Alfred A. Knopf, 1929 [1923]), xi. See C. Kenneth Waters and Albert van Helden, eds., *Julian Huxley, Biologist and Statesman of Science* (Houston, TX: Rice University Press, 1992).

<sup>12</sup> Julian Huxley, "The Courtship of Animals" [originally published in *The Forum*, July 1926], reprinted in *The Uniqueness of Man* (London: Chatto and Windus, 1941), 190–206.

<sup>13</sup> Julian Huxley, "Sex Biology and Sex Psychology," in *Essays of a Biologist* (ref. 11), 160–65, originally read before the Society for Sex Psychology, October 1922.

<sup>14</sup> Julian Huxley, "Uniqueness of Man," in *The Uniqueness of Man* (ref. 12), 1–33, on 32.

<sup>15</sup> Charles Darwin, *On the Origin of Species by Means of Natural Selection* (London: John Murray, 1859), 88–90. On Darwin, see Janet Browne, *Charles Darwin: A Biography*, 2 vols. (New York: Knopf, 1995–2002).

wrote, “depends, not on a struggle for existence, but on a struggle between the males for possession of the females; the result is not death to the unsuccessful competitor, but few or no offspring.” The competition between males for reproductively available females leant males of some species “indomitable courage, length to the spur, and strength to the wing,” while female choice tended to endow males instead with melody and beauty. Thus, he reasoned, males and females came to differ in “structure, colour, or ornament.” Several years later, Darwin devoted many more pages to elaborating his theory of sexual selection in *The Descent of Man*.<sup>16</sup> Differences between the sexes and among races of the same species constituted widely known phenomena that Darwin felt he could not explain with reference to either survival advantage or functional fit with the environment, but might be accounted for through male competition and female choice of mates. Sexual selection became his preferred means of explaining the evolution of such stable differences between members of the same species, both sexual and racial. To account for beauty and armaments in many animal species, he posited a sliding scale of intelligence and emotionality connecting animals and humans.<sup>17</sup> Darwin reserved for humans the ability to contemplate our future by drawing lessons from the past and morally weighing our actions—for him, these distinguished humans from other animals more so than the capacity to esthetically choose or compete over sexual partners in the present.<sup>18</sup> This left him room to suggest, too, that mate selection in humans, by either choice or competition, likely played a major role in the origin (and maintenance) of human “races.”<sup>19</sup>

In the coming decades, female choice and even male–male competition became increasingly associated with the future of humanity as well, as eugenicists appropriated evolutionary and genetic rhetoric for their own purposes. Conservatives, feminists, and socialists alike emphasized the potentially transformative power of mate choice in shaping new generations.<sup>20</sup> Alfred Russel Wallace—hailed now as the co-discoverer of natural selection but equally well known while he was alive for his work on the biogeography of Australasia—had written about the benefits of female choice relieved of economic constraint to the “Women of the Future” and, sympathetically, that “the hope of

the future lies with women.”<sup>21</sup> Wallace optimistically predicted that social reform, including the economic independence of women, would allow them free choice of husbands. As he, like many scientists active in late nineteenth-century England, had assumed that the moral and esthetic sensibilities of women were keener than those of men, he concluded that new rules of marriage selection would spontaneously emerge.<sup>22</sup> Women would refuse to marry men who were “vicious, degraded, of feeble intellect and unsound bodies” and as a result these men would leave no offspring, dramatically improving the population in a handful of generations.<sup>23</sup> Fears of racial degeneration similarly motivated eugenicists who believed that natural selection—the mechanism all evolutionary thinkers agreed had shaped humans in the past—had ceased to function in civilized societies thanks to rapid advances in medicine and public health. Advocates of positive eugenics thus seized upon the careful selection of mates as one means of improving the quality of children populating the next generation.<sup>24</sup> In this way, eugenic rhetoric tightly linked the past and future of racial differentiation with reproduction and implied (sometimes explicitly) that biological races possessed different essential natures (Figure 1).<sup>25</sup>

One of the most prolific writers of popular biology during the interwar period, J. B. S. Haldane also thought deeply about the biological future. He worried that humanity looked toward the future out of dissatisfaction with the present. Many people, he wrote, thought their lives were incomplete and others hoped to meet friends who had died too early. As a result, most attempts to describe the future focused on the near, on the familiar.<sup>26</sup> Contemplating the far future ended up firmly in the realm of speculation and although Haldane thought eugenic theory had some merit, even in 1938—before the horrors of the Holocaust caused a more widespread reaction—he wrote that eugenics was too often used as a tool of class warfare, unjustified compulsory sterilizations, and the unfair expulsion of Jews from Germany.<sup>27</sup> These myths were no less powerful for being wrong and as he criticized them on the one hand, Haldane supplied alternative socialist visions on the other.<sup>28</sup>

If humans could work together for a better future, he

<sup>16</sup> Charles Darwin, *Descent of Man and Selection in Relation to Sex* (London: John Murray, 1871); Erika Lorraine Milam, *Looking for a Few Good Males: Female Choice in Evolutionary Biology* (Baltimore: Johns Hopkins University Press, 2010).

<sup>17</sup> Charles Darwin, *The Expression of the Emotions in Man and Animals* (London: John Murray, 1872); see also George J. Romanes, *Mental Evolution in Animals with a Posthumous Essay on Instinct by Charles Darwin* (London: Kegan Paul, Trench & Co, 1885) and *Mental Evolution in Man: Origin of Human Faculty* (London: Kegan Paul, Trench & Co, 1888). Eveleen Richards, “Darwin and the Descent of Woman,” in *The Wider Domain of Evolutionary Thought*, ed. David Oldroyd and Ian Langham (Dordrecht: D. Reidel Publishing Company, 1983), 57–111 and *Darwin and the Making of Sexual Selection* (Chicago: University of Chicago Press, 2017).

<sup>18</sup> Darwin, *Descent of Man* (ref. 16), 391–92.

<sup>19</sup> Evolutionary theorist and statistician Ronald Aylmer Fisher made this connection explicit in later chapters of *The Genetical Theory of Natural Selection* (Oxford: The Clarendon Press, 1930). See Fisher’s negative reactions to the UNESCO 1950 Statement on Race; Jenny Reardon, “Post-WWII Expert Discussions on Race,” in *Race to the Finish: Identity and Governance in an Age of Genomics* (Princeton: Princeton University Press, 2005), 17–44.

<sup>20</sup> See Kimberly Hamlin on the logics of sexual selection as appropriated by members of the women’s movement in the United States, *From Eve to Evolution: Darwin, Science, and Women’s Rights in Gilded Age America* (Chicago: University of Chicago Press, 2014).

<sup>21</sup> Alfred Russel Wallace, “Human Selection,” *Fortnightly Review*, September 1890 and “Women and Natural Selection (Interview of Alfred Russel Wallace),” *Daily Chronicle*, December 4, 1893, 3. On Wallace, see Peter Raby, *Alfred Russel Wallace: A Life* (London: Chatto & Windus, 2001).

<sup>22</sup> On the late nineteenth-century gendering of male and female bodies through science, see Cynthia Eagle Russett, *Sexual Science: The Victorian Construction of Womanhood* (Cambridge: Harvard University Press, 1989).

<sup>23</sup> Wallace, “Women and Natural Selection” (ref. 21), 3. On the entanglement of eugenic and gendered ideals in the United States, see Wendy Kline, *Building a Better Race: Gender, Sexuality, and Eugenics from the Turn of the Century to the Baby Boom* (Berkeley, CA: University of California Press, 2001).

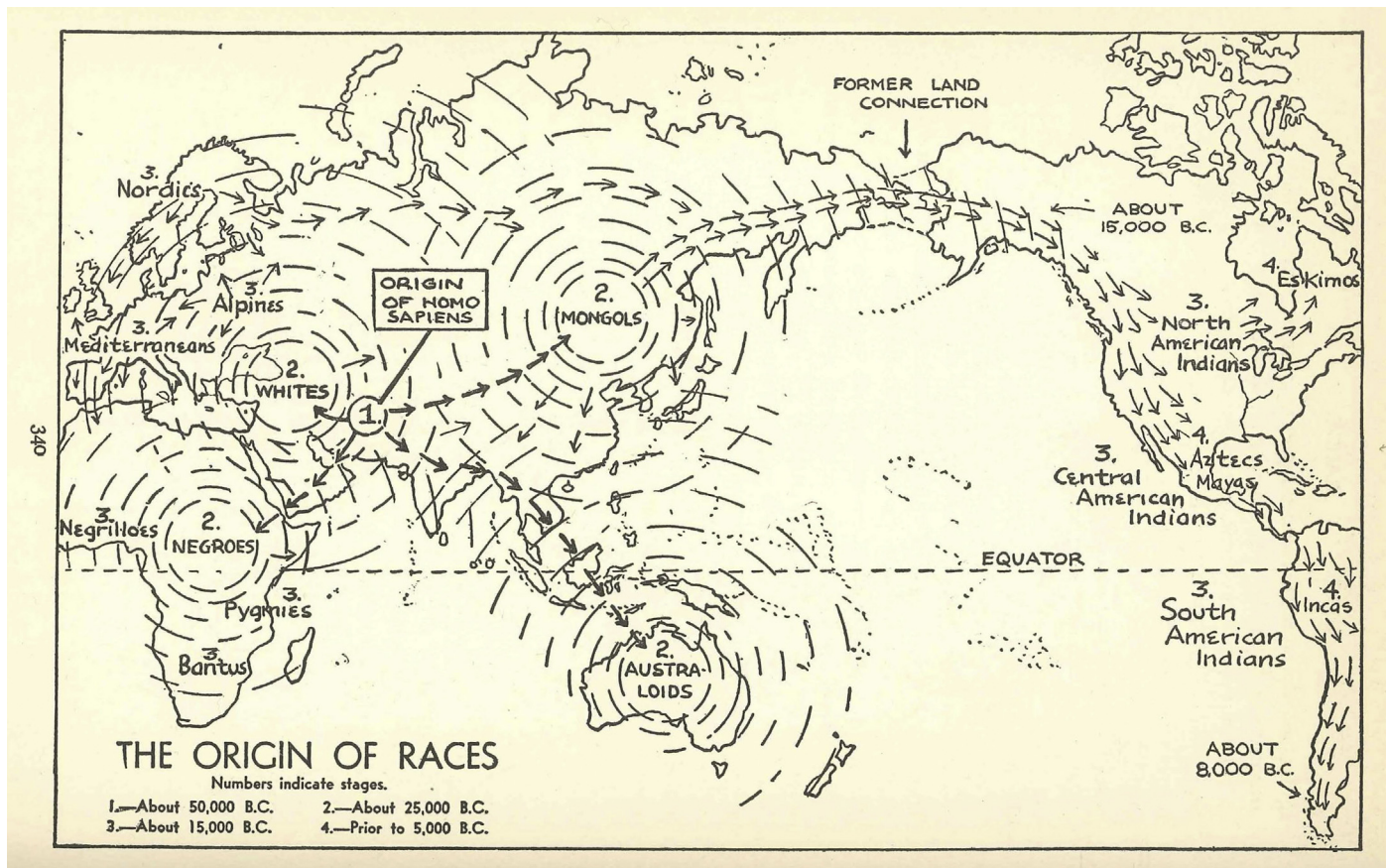
<sup>24</sup> Susan Rensing, “Falling in Love Intelligently: Eugenic Love in the Progressive Era,” *Journal of Popular Romance Studies* 5, no. 2 (2016), <http://jprstudies.org/2016/07/falling-in-love-intelligently-eugenic-love-in-the-progressive-era-by-susan-rensing/>.

<sup>25</sup> For example, see Laura Briggs, *Reproducing Empire: Race, Sex, Science, and U. S. Imperialism in Puerto Rico* (Berkeley: University of California Press, 2002) and Alexandra Minna Stern, *Eugenic Nation: Faults and Frontiers of Better Breeding in Modern America* (Chicago: University of Chicago Press, 2005).

<sup>26</sup> J. B. S. Haldane, *Daedalus or Science and the Future* (London: Kegan Paul, Trench, Trubner & Co., Ltd., 1925).

<sup>27</sup> J. B. S. Haldane, *Heredity and Politics* (London: George Allen & Unwin, 1938), 7; *Keeping it Cool and Other Essays* (London: Chatto & Windus, 1940), 141.

<sup>28</sup> Haldane invoked George Bernhard Shaw’s Lamarckian *Back to Methuselah* (London: Constable, 1921) and Olaf Stapledon’s *Last and First Men* (London: Methuen, 1930) numerous times in his writings. See Piers Hale’s explication of natural selection and socialism for Darwin and his contemporaries, *Political Descent: Malthus, Mutualism, and the Politics of Evolution in Victorian England* (Chicago: University of Chicago Press, 2014).



**Figure 1.** “The Origin of Races” as pictured in Amram Scheinfeld’s *You and Heredity* (New York: Frederick A. Stokes Company, 1939, page 340). His reconstruction of events reflects contemporary beliefs that *Homo sapiens* originated in Eurasia and subsequently migrated to other continents.

believed, everyone’s economic interests could be raised, along with our intelligence and empathy.

The social and economic transformations wrought even before the resolution of the Second World War led many biologists to rethink the political message evolutionary theory could hold for the future of humanity.<sup>29</sup> Writing in 1941, Huxley worried that even if the Allies proved victorious, “civilization is not necessarily safe.” He continued: “The new belief must be a social one, based on the concept of society as an organic whole, in which rights and duties are balanced deliberately, as they are automatically balanced in the tissues of the animal body. Economic values must lose their primacy and become subordinated to social values.”<sup>30</sup> Both Haldane and Huxley firmly believed that evolutionary theory could be used to fight against the fascist ideologies tearing Europe apart. Equally important, they hoped to rebuild by mobilizing scientific theories, including evolution, based on biological equality to create a more equitable future for all humanity.

### Postwar Universals

In the years after the Second World War, evolutionary concepts of humanity continued to constitute a resilient bridge between our brute past and anticipatory future,

but with a twist. Once humans became human, liberal scientists now argued, evolution worked differently than in other species because the paleontological origins of humanity were inextricably linked to the development of culture. As a result, easy analogies between natural selection in animals and people, like those made by eugenicists before the war, now sounded like overly simplistic misrepresentations of a far more complicated process. Leading scientists, especially those we now associate with the “modern synthesis” of evolutionary thought with classical genetics, sought to speak directly to an elusive reading public and convey a hopeful message of the biological unity of mankind.<sup>31</sup> In the United States, paleontologist George Gaylord Simpson and population geneticist Theodosius Dobzhansky had met Huxley and Haldane before the war, but they all came to see far more of each other in subsequent decades thanks to the increased ease of intercontinental transportation and postwar international collaborations in the name of peace. In this framework, the past and present of humanity formed a common platform from which to speculate about our future. Conceptualizing possible biological futures for humanity thus required

<sup>29</sup> Marianne Sommer, “Biology as a Technology of Social Justice in Interwar Britain: Arguments from Evolutionary History, Heredity, and Human Diversity,” *Science, Technology, & Human Values* 39, no. 4 (2014): 561–86.

<sup>30</sup> Huxley, *Uniqueness of Man*, viii–ix.

<sup>31</sup> Simultaneously, scientists replaced the rhetorical importance of morphological and behavioral theories of race with a science of human diversity based on outwardly invisible blood groups. Jenny Bangham, “Blood Groups and Human Groups: Collecting and Calibrating Genetic Data after World War Two,” *Studies in History and Philosophy of Biological and Biomedical Sciences* 47 (2014):4–86.

that postwar scientists first agree on which biological characteristics defined humanity as a whole.

Simpson was passionate about his work and notoriously cranky with those who disagreed with him.<sup>32</sup> From his perspective, controlling mate choice and reproductive capacity resonated with the least ethical principles advocated in pre-war “supposedly eugenical” ideologies. Simpson argued that any belief in which “biological superiority is correlated with color of skin, with religious belief, with social status, or with success in business is *imbecile* in theory and *vicious* in practice.”<sup>33</sup> Over the long course of his career, Dobzhansky became one of the colleagues Simpson especially respected. For fourteen years after the war, they both served as faculty at Columbia University—although Simpson’s primary position was as Curator at the American Museum of Natural History just two miles south in Manhattan. Then, a few years after Simpson accepted a position at Harvard in 1959, Dobzhansky moved across Central Park to the Rockefeller Institution. Dobzhansky similarly suggested that biological fitness did not always correlate with “the ability to win in combat” and was indeed “much more likely to be furthered by the inclination to avoid combat, and in any case, it is measured in terms of reproductive success rather than in terms of numbers of enemies destroyed.”<sup>34</sup> Both scientists sought to sever the relationship in lay readers’ minds between evolutionary theory and Nazi ideology.<sup>35</sup>

Dobzhansky and Simpson advanced two main arguments in their books designed to reach a more general public than would have interest in their research articles. Primarily they asserted that eugenicists had misunderstood evolutionary theory. Each pointed to the basic mistake of thinking that natural selection depended on “the struggle for existence” or “the survival of the fittest”—a tradition easily traced back to popular visions of Herbert Spencer’s cultural evolution.<sup>36</sup> According to Simpson, this misunderstanding had led to the “unfortunate” “ethical, ideological, and political repercussions” of eugenics movements around the world, brought to horrifying expression in Nazi policies of racial purity.<sup>37</sup> The fault lay not in evolution itself, but in the naïve biologism that gripped non-scientists.

<sup>32</sup> Léo Laporte, *George Gaylord Simpson: Paleontologist and Evolutionist* (New York: Columbia University Press, 2000).

<sup>33</sup> George Gaylord Simpson, *Meaning of Evolution: A Study of the History of Life and of Its Significance for Man* (New Haven: Yale University Press, 1949), 334.

<sup>34</sup> Dobzhansky, *Biological Basis of Human Freedom* (ref. 4), 126; Mark Adams, ed., *The Evolution of Theodosius Dobzhansky: Essays on His Life and Thought in Russia and America* (Princeton NJ: Princeton University Press, 1994).

<sup>35</sup> It is beyond the scope of this essay to distinguish between the history of evolutionary thought in Germany and American characterizations of the same. Instead, let me direct you to (in English): Anton Weiss-Wendt and Rory Yeomans, eds., *Racial Science in Hitler’s New Europe, 1938–1945* (Lincoln, NE: University of Nebraska Press, 2013); Franz-Josef Brüggemeier, Mark Cioc, and Thomas Zeller, eds., *How Green Were the Nazis? Nature, Environment, and Nation in the Third Reich* (Athens, OH: Ohio University Press, 2005); Stefan Kühl, *The Nazi Connection: Eugenics, American Racism, and German National Socialism* (New York: Oxford University Press, 2002); Mark B. Adams, ed., *The Wellborn Science: Eugenics in Germany, France, Brazil, and Russia* (New York: Oxford University Press, 1990); Paul Weindling, *Health, Race, and German Politics between National Unification and Nazism, 1870–1945* (Cambridge, UK: Cambridge University Press, 1989), and for original sources in translation, Anson Rabinbach and Sander Gilman, eds., *The Third Reich Sourcebook* (Berkeley: University of California Press, 2013).

<sup>36</sup> On Spencer’s widespread influence, see Bernard Lightman, ed. *Global Spencerism: The Communication and Appropriation of a British Evolutionist* (Leiden: Brill, 2015).

<sup>37</sup> Simpson, *Meaning of Evolution* (ref. 33), 221.

Cultural anthropologist Clyde Kluckhohn agreed. A prolific writer, Kluckhohn twice won the Whittlesey House Science Award for popular writing and was hailed by a reviewer in the *New York Times* as “the new prophet of the new anthropology.”<sup>38</sup> “Most men,” Kluckhohn wrote in *Mirror for Man*, “want simple answers”—especially Americans.<sup>39</sup> He suggested that as religious faith slowly winnowed in the Western world, physical science brought creature comforts and biological science seemed on the verge of ending diseases of the flesh. Between them, it appeared possible that scientists would eventually find answers to “all the riddles of the universe.”<sup>40</sup> In that deceptive appeal lay the popular origins of pernicious appetites for biologism.<sup>41</sup> In short, these scientists shared a belief that evolution in humans could not be understood as a simple extension of genetic processes described in plants and non-human animals without substantial risk of potentially repeating errors of logic that had already led to so much loss of life and liberty.

Secondly, Dobzhansky and Simpson promoted an ethical and progressive message of hope, by contending that modern human races originated long after humanity itself. In doing so, they constructed humanity as a singular evolutionary unit. Most importantly, they maintained that all human cultures had “evolved” equally within this shared biological lineage. Even if humanity had once been subdivided into smaller communities, interbreeding among these communities had never stopped. In the rapidly globalizing postwar world, people from different races were meeting, falling in love, and building families in ever-greater numbers.<sup>42</sup> Any biological characteristics specific to one particular race were thus quickly being dispersed through the rest of the human population. Whether or not readers of their books agreed about the desirability of this process, most believed it would continue unless checked by social factors. In the future, Dobzhansky and Simpson thus projected, racialized differences would vanish along with cultural inhibitions.

Dobzhansky and Simpson were far from the only scientists who shared these ambitions and perspectives (see Debbie Weinstein, this issue). One solution, advocated by cultural anthropologist Ashley Montagu, was to remove the word “race” from scientific discourse as a meaningless concept, a position he broadcast through the controversial UNESCO Statement on Race that he crafted in 1950.<sup>43</sup> Physical anthropologist Sherwood Washburn, on the other hand, argued that races were real biologically—he called them “an expression of nature” rather than a manifestation of language, religion, nationality, social habits or any other

<sup>38</sup> “\$10,000 Book Award won by Harvard Man,” *New York Times*, March 15, 1947, 11; Bernard Mishkin, “Science on the March,” *New York Times*, January 30, 1949, BR15.

<sup>39</sup> Clyde Kluckhohn, *Mirror for Man: The Relation of Anthropology to Modern Life* (Tucson, AZ: University of Arizona Press, 1985 [1949 McGraw Hill]), 105.

<sup>40</sup> Kluckhohn, *Mirror for Man*, 105.

<sup>41</sup> In his analysis of the situation, Kluckhohn cites Morris Opler, “Fact and Fallacy Concerning the Evolution of Man,” *Philosophy and Phenomenological Research*, June 1947. On organicism in German thought, see Anne Harrington, *Reenchanted Science: Holism in German Culture from Wilhelm II to Hitler* (Princeton: Princeton University Press, 1996), 175–206.

<sup>42</sup> Paul Farber, *Mixing Races: From Scientific Racism to Modern Evolutionary Ideas* (Baltimore: Johns Hopkins University Press, 2010).

<sup>43</sup> Jenny Bangham, “What is Race? UNESCO, Mass Communication and Human Genetics in the early 1950s,” *History of the Human Sciences* 28, no. 5 (2015): 80–107; Michelle Brattain, “Race, Racism, and Antiracism: UNESCO and the Politics of Presenting Science to the Postwar Public,” *American Historical Review* 112, no. 5 (2007): 1386–413; UNESCO, *Four Statements on the Race Question* (Paris: UNESCO, 1969).

cultural trait.<sup>44</sup> Washburn further insisted that the best way to understand race was by using the tools of comparative anatomy and taxonomy to reconstruct historical ancestry.<sup>45</sup> For him, the difficulty lay not in the quest, which could remain noble, but in the proxy measures scientists often used when thinking about race. Just as cranial capacity could never substitute for understanding intelligence, anatomy alone could never solve the complex reality of human ancestry. What physical anthropology revealed, he suggested, was that the modern races were only a few thousand years old. And even if that calculation were wrong in its specificity, Washburn emphasized that the fossils of ancient men recently discovered by paleoanthropologists differed profoundly from “modern man.” Early *Homo sapiens* fossils, he suggested, would be able to pass unremarked in the New York subway whereas Neanderthals and Australopithecines would stick out from the crowd (Figure 2). In response to an imagined question from his readers—“To which of the living races are these ancient fossils particularly closely-related?”—he wrote, “To none.”<sup>46</sup> Washburn sympathized with the political motivation behind Montagu’s desire to get rid of the word “race” but feared that using another, like “ethnicity,” to stand for the same concept would merely obscure the underlying problem and lay misunderstandings of race and humanity would continue as before. He concluded that one instantiation of race had proved particularly problematic and was based on useless categories: “Race: Pure Nordic; Location: Nowhere; Method: Imagination; Result: Nonsense.”<sup>47</sup>

This message carried particular weight given the struggle for Civil Rights across the country. In 1954, for example, the US Supreme Court declared segregated “separate but equal” schools unconstitutional in their landmark *Brown v. Board of Education of Topeka* decision.<sup>48</sup> Chief Justice Earl Warren wrote in the court’s unanimous decision that education served as “a principle instrument in awakening the child to cultural values, in preparing him for later professional training, and in helping him to adjust normally to his environment.” No child could expect to succeed without “the opportunity of an education.” Given the importance of education in society, the court argued that segregated schools denied equal opportunity to students. This held not only in cases where schools for “white” and “colored” children were grossly unequal but also when tangible factors like the quality of the buildings, curricula, and teachers were similar. The act of segregation itself negatively affected the mental development of children excluded from certain schools and therefore violated the Fourteenth Amendment’s guarantee of equal protection under the law for all American citizens. As evidence, Warren cited sociological and psychological research on race, prejudice, and the effects of segregation.<sup>49</sup> The Supreme Court’s decision thus highlighted

both the power of education in individual and national self-realization and the ethical implications of social scientific research on a national stage.

Warren’s logic resonated with anthropologists’ and biologists’ conviction that education provided an important tool for encouraging an anti-racist, progressive view of humanity to gain purchase in American society as a whole. Haldane, Huxley, Simpson, and Dobzhansky each tried to reach a popular audience by publishing books.<sup>50</sup> Perhaps more successful, however, were television programs that held the attention of parents and were deemed appropriate for children, like the *National Geographic Specials*, which started in 1965 with *Miss Goodall and the Wild Chimpanzees*, and later Jacob Bronowski’s thirteen-episode *The Ascent of Man* released with a companion book in 1973.<sup>51</sup> A well-respected mathematician and advocate of scientific humanism, in the 1950s Bronowski became interested in evolutionary theory when asked to use his statistical acumen to help analyze a fossil skull.<sup>52</sup> Two decades later, he devoted the first episode of his television series to the history of humanity preceding the dawn of agriculture and it fit well with the optimistic tones established by evolutionary scientists in the previous decade. Each episode described a “brilliant series of cultural peaks” given physical form in the inventions that enabled humans from age to age to successively remake their environment—a series he dubbed the “ascent of man.”

Evolutionary thinkers agreed with Washburn that sexual selection seemed unlikely to have much selective power in human societies once cultural selection joined natural selection in shaping humanity’s minds and bodies—in other words, once humans became human. Instead, they turned to natural selection to explain the origins of visible racial characteristics, especially the influence of climate, amount of sunshine, and food resources. Washburn reasoned that as strict kinship systems dictated marriage rules and controlled potential courtships, the free choice in mates required for sexual selection to operate was unlikely to be found in early human societies.<sup>53</sup>

All of this added up to a progressive history, for humanity at least. Even though scientists had plenty of examples of evolutionary dead-ends and failures in the fossil record, the overall trend of those species still alive was to greater complexity, greater beauty, and greater mutual regard.<sup>54</sup>

<sup>50</sup> Melinda Gormley, “Pulp Science; Education and Communication in the Paperback Book Revolution,” *Endeavour* 40, no. 1 (2016): 24–37.

<sup>51</sup> Marshall Flaum, dir. *Miss Goodall and the Wild Chimpanzees* (National Geographic Specials, 1965), 60 min; Jacob Bronowski, *The Ascent of Man*, 13-episode television miniseries (BBC, Time-Life Television Productions, 1973)—the first episode “Lower than the Angels” covered all human history before the advent of agriculture. See also, Bronowski, *Ascent of Man* (ref. 4). On the stunning success of postwar educational television shows about nature and science see Gregg Mitman, *Reel Nature: America’s Romance with Wildlife on Film* (Cambridge, MA: Harvard University Press, 1999) and Marcel Chotkowski LaFollette, *Science on American Television* (Chicago: University of Chicago Press, 2013).

<sup>52</sup> Lisa Jardine, “Dad’s Slide Rule Armageddon,” *Sunday Times*, November 28, 2010, 7; Ralph Demarais, “Jacob Bronowski: A Humanist Intellectual for an Atomic Age, 1946–1956,” *British Journal for the History of Science* 45, no. 4 (2012): 573–89.

<sup>53</sup> Washburn, “Thinking About Race”; see also John Hurrell Crook, “Sexual Selection, Dimorphism, and Social Organization in the Primates,” in *Sexual Selection and the Descent of Man*, ed. Bernard Campbell (Heinemann: London, 1972), 231–81, esp. 248.

<sup>54</sup> Loren Eiseley, *The Immense Journey: An Imaginative Naturalist Explores the Mysteries of Man and Nature* (New York: Random House, 1946); J. B. S. Haldane, *The Unity and Diversity of Life* (Delhi: Ministry of Information & Broadcasting, 1958).

<sup>44</sup> Sherwood L. Washburn, “Thinking About Race” *Annual Report Smithsonian Institution* (1945): 363–378.

<sup>45</sup> Sherwood L. Washburn, “The New Physical Anthropology,” *Transactions of the New York Academy of Sciences*, Series II 13/7 (1951): 298–304.

<sup>46</sup> Washburn, “Thinking About Race” (ref. 44), 370.

<sup>47</sup> Washburn, “Thinking About Race” (ref. 44), 377.

<sup>48</sup> 347 U.S. 483 (1954).

<sup>49</sup> John P. Jackson, Jr., *Social Scientists for Social Justice: Making the Case Against Segregation* (New York: New York University Press, 2001). Conservatives also found their scientific experts, see John P. Jackson, Jr., *Science for Segregation: Race, Law, and the Case Against Brown v. Board of Education* (New York: New York University Press, 2005).



**Figure 2.** A family of *Homo neanderthalis*, pictured in front of the Rock of Gibraltar. Maurice Wilson's 1950 watercolors reconstructing the lives of prehistoric humans were reproduced in several publications designed to reach popular audiences, including several versions of Time Life books in the United States in which his images were altered to make them appropriate for young readers.

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Dobzhansky lamented that Darwin titled his second great book “the ‘Descent,’ rather than the ‘Ascent’ of man.” For Dobzhansky, the “long and toilsome ascent from animality to humanity” had taken strength and purpose. To ignore that risked losing sight of humanity’s accomplishments, including the necessity of God.<sup>55</sup> By elucidating humanity’s past, scientists placed themselves at the forefront of interpreting our future. Even anthropologist Kluckhohn wrote that “scientific humanism should be the sturdy creed of the future” and hoped that the “common man or his leaders” would pay more attention to the deeper lessons science had to offer rather than uncritically worshipping its inventions.<sup>56</sup>

By emphasizing the unity of humanity, many evolutionists at the time agreed implicitly with ornithologist Ernst Mayr’s argument that all of the pre-human hominid fossils then known represented a single lineage, whether or not they also agreed that therefore they should all be known by the same taxonomic name. Mayr had initially made a name

for himself studying the taxonomy and biogeography of living birds, publishing *Systematics and the Origin of Species*, in which he defined species as actually or potentially interbreeding populations, reproductively isolated from other related groups.<sup>57</sup> Then, at a conference on “The Origin and Evolution of Man” at Cold Spring Harbor Laboratory in 1950, Mayr accused the assembled audience of taxonomic splitting. The numerous scientific names they had created, he argued, were not warranted—each new fossil was unlikely to represent an entirely new species—as humanity had likely evolved in a series of iterative transformations.<sup>58</sup> Additionally, Mayr dismissed morphology as a reliable basis for diagnosing taxonomic relationships, yet morphological differences between specimens constituted the primary data of paleoanthropologists. According to Mayr’s critics, reproductive isolation worked well for delimiting extant bird species but set an impossible standard by which

<sup>55</sup> Theodosius Dobzhansky, *The Biology of Ultimate Concern* (New York: New American Library, 1967), 3.

<sup>56</sup> Kluckhohn, *Mirror for Man* (ref. 39), 260.

<sup>57</sup> Ernst Mayr, *Systematics and the Origin of Species from the Viewpoint of a Zoologist* (New York: Columbia University Press, 1942).

<sup>58</sup> Ernst Mayr, “Taxonomic Categories in Fossil Hominids,” *Cold Spring Harbor Symposia on Quantitative Biology* 15 (1950): 109–18.

to judge fossils. Yet this unitary vision of human evolution remained dominant until new fossil finds extended the known varieties and ranges of *Australopithecus* and extinct *Homo* species, demonstrating that in the past several pre-human groups had co-existed for extended periods of time. A generation later, paleoanthropologists would criticize mid-century scientists for taking Mayr's advice and contributing to a "saga of a lone hero battling from primitiveness to perfection over the eons, armed with nothing but natural selection and its own wits."<sup>59</sup> (In fact, now our evolutionary tree more closely resembles a bush than a pine.) These criticisms, however, overlooked the persuasive power of this framework in the postwar era because of its resonance with an anti-racist commitment to variation within a singular, progressive human lineage.

For Mayr as for Dobzhansky and Simpson, humanity constituted a coherent interbreeding population—a "family of man"—extended back in evolutionary time (Figure 3).<sup>60</sup> In emphasizing humanity's ascent from this original common nature, evolutionists provided an illimitable potential future for the human species, as long as we did not in the meantime ruin the earth or kill ourselves in an ecological or nuclear holocaust (see Myrna Perez Sheldon, this issue).

### Contingent Futures

Much like biologists before the war, Dobzhansky and Simpson also contended that the present and future of humanity operated according to fundamentally different mechanisms than its deep past, even if they insisted natural selection never stopped working. In humans, unlike other animal species, biological evolution worked together with social/cultural evolution. Present cultural flexibility in turn denoted the plurality of destinies that might await humanity, simultaneously preserving a progressive view of our past and emphasizing the contingency of the future.

Evolutionary biologists' understanding of human culture reflected contemporary anthropological theory. In 1964, anthropologist Clifford Geertz derided the anthropological theories of earlier decades for promoting the idea of a "critical point" in the origin of humanity.<sup>61</sup> Anthropologists had believed, he wrote, that "Man's humanity, like the flare of a struck match, leaped into existence."<sup>62</sup> In this version of paleoanthropological history, an evolutionary leap took place through the tight interaction of several factors—increased brain size, bipedalism, family structure, a new ecology of life on the savannah, hunting and access to meat, and language—all caught in a maelstrom of

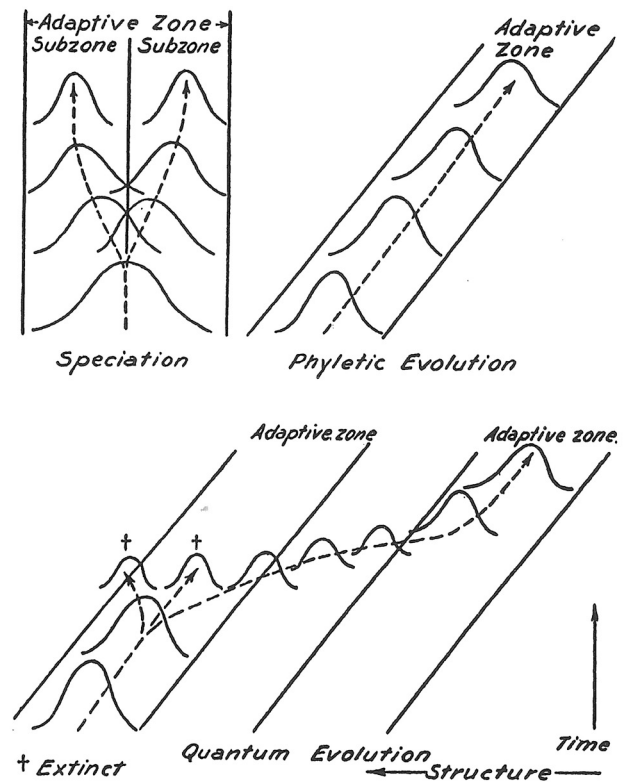


FIG. 31.—Diagrams of characteristic examples of the three major modes of evolution. In this and Figs. 32-33 the broken lines represent phylogeny and the frequency curves represent the populations in successive stages.

Figure 3. Three modes of evolution as depicted in George Gaylord Simpson's *Tempo and Mode in Evolution* (New York: Columbia University Press, 1984, page 198). The first depicts the process of speciation based on ecological separation and local adaptation, the second phyletic evolution of a single population adapting to a slowly changing environment, and the third, quantum evolution, when a subpopulation finds and exploits a new ecological niche. It was the last of these that he thought best characterized the history of our pre-human ancestors moving from the ecological safety of the forest to the unexploited open savannah. © 1944. Reprinted with permission of the publisher and Simpson's estate.

positive feedback that resulted in the origins of human culture. Geertz noted that, in the meantime, new fossil finds revealed that *Australopithecus*, with a brain case about one-third the size of modern humans, appeared to use weapons and exhibited something that resembled proto-culture. New primatological evidence, too, demonstrated that baboon and chimpanzee behavior were more complicated than anthropologists had previously thought possible. Jane Goodall observed chimpanzees strip leaves off a vine and use the stalk to fish for termites, even carry these manufactured tools while searching for more nests.<sup>63</sup> The former bright line between human and animal seemed more like a hazy stripe.

Nevertheless, for evolutionary biologists it still appeared that on each side of this slowly developing dichotomy animal nature differed fundamentally from the full manifestation of culture in humans. And in the grand scheme of the Earth's 4.6-billion-year history, the origins of human culture had taken place rather quickly and quite

<sup>63</sup> On Goodall's research and primatology as a means of reconstructing human nature, see Donna Haraway, *Primate Visions: Gender, Race, and Nation in the World of Modern Science* (New York: Routledge, 1989).

<sup>59</sup> Ian Tattersall, *The Strange Case of the Ricketty Cossack and Other Cautionary Tales from Human Evolution* (New York: Palgrave Macmillan, 2015), 213; see also, Jonathan Marks, *Tales of the Ex-Apes: How We Think about Human Evolution* (Berkeley: University of California Press, 2015).

<sup>60</sup> Edward Steichen, *The Family of Man*, prologue by Carl Sandburg (New York: Simon and Schuster for the Museum of Modern Art, 1955); Fred Turner, *The Democratic Surround: Multimedia and American Liberalism from World War II to the Psychedelic Sixties* (Chicago: University of Chicago Press, 2013), 181-212.

<sup>61</sup> Alfred L. Kroeber articulated the idea without calling it a "critical point" in "The Superorganic," *American Anthropologist* 19 (1917): 163-213; R. L. Lee and M. J. O'Brien, "The Concept of Evolution in Early Twentieth-Century Americanist Archeology," *Archeological Papers of the American Anthropological Association* 7 (1997): 21-48. It seems to be Clifford Geertz who, in retrospect, used the phrase to encapsulate Kroeber's position, e.g., Clifford Geertz, "The Transition to Humanity," in *Horizons of Anthropology*, ed. Sol Tax (Chicago: Aldine, 1964), 38.

<sup>62</sup> Geertz, "Transition to Humanity" (ref. 60), 39.



recently. Dobzhansky posited that “Man... is so much unlike any other biological species that his evolution cannot be adequately understood in terms of only those causative factors which are operating in the biological world outside the human kind.”<sup>64</sup> He emphasized the singularity of the evolutionary process in humans thanks to our capacity for culture—part and parcel of a strategy keeping eugenic theory at bay.<sup>65</sup> Simpson preferred the term “social evolution” and argued that it comprised a kind of inter-thinking, which he contrasted with organic evolution’s dependence on inter-breeding. “The most brilliant of geniuses is an intellectual eunuch if his knowledge is not disseminated as widely as possible,” Simpson wrote.<sup>66</sup> By extension he reasoned it was immoral for any scientist, industry, or nation to keep the knowledge they generated to themselves—especially information about humanity’s place in the universe, which “must guide us if we are to control the future evolution of mankind.” When Dobzhansky described the rare instance of this “radically new kind of biological organization,” he used a concept from Simpson’s *Tempo and Mode of Evolution*.<sup>67</sup> The origins of humanity lay in a quantum evolutionary transition, he wrote—a “pronounced break in the biological continuity”—that ushered in a “third kind of history.”<sup>68</sup> Cosmic history described the physical evolution of the universe and then everything changed when the origins of life created biological evolution. The origins of humanity changed things again. Our “superorganismic culture” provided an enormously powerful means of adapting to the environment, “the most powerful method... ever developed by any species.”<sup>69</sup> Simpson wrote, and Dobzhansky quoted, that “Man has risen, not fallen... Evolution has no purpose; man must supply this for himself.”<sup>70</sup>

Dobzhansky also worried about the popular invocation of Darwin’s name in the same breath as Copernicus and Galileo as three men who secularized the natural world. As a member of the Eastern Orthodox church, his faith became even more important to him after his wife passed away in 1969. Dobzhansky saw evolution and theological belief as more than mutually compatible. For him, the origins of culture allowed humans to be the first and the only of God’s creations to appreciate the majesty of the natural world. With our self-conscious awareness of our place in the universe, he believed, evolution could act as beacon of hope. Even if the cosmic order could never be geocentric, he thought though there might yet be a case for its anthropocentric nature.<sup>71</sup> Dobzhansky saw his belief as resonating deeply with the writings of Jesuit theologian Pierre Teilhard de Chardin. In his most widely read publication, *Phenomenon of Man*, Teilhard had argued that divine guidance played a direct role in the path of human

history. In the future, he postulated a religious transhumanism in which the minds of all people would converge in a shared ecstatic consciousness—the Omega Point, or final stage of progressive cosmological evolution.<sup>72</sup> Simpson and Dobzhansky agreed on much, but when it came to Teilhard de Chardin, they parted ways. When Dobzhansky retired to Davis, California in 1971, he missed his Teilhardian friends from New York greatly. Simpson found Teilhard’s theories inconsistent and mystical.<sup>73</sup> In a letter to a friend, Simpson even called Teilhard a hypocrite who had broken all three of his sacred vows to “chastity, poverty, and obedience.”<sup>74</sup> After reading a draft of Dobzhansky’s *The Biology of Ultimate Concern*, Simpson wrote gently to his friend suggesting that although he enjoyed the book, he disagreed with Dobzhansky’s invocation of Teilhard’s ideas in the final chapter. Simpson suggested that Dobzhansky’s admiration for the theologian led him to read his work too generously and to attribute to Teilhard his own ideas: “things that you think he should have believed when in fact he did not and even in some cases believed the exact opposite.”<sup>75</sup> The biggest sticking point for Simpson was that Teilhard had advanced a form of directed evolution that no advocate of modern evolutionary theory could accept—especially Dobzhansky.

This exchange highlights one of the difficulties facing evolutionary scientists in the postwar era, who crafted a conception of evolution as progressive but not determinist. The open-ended future of humanity provided a key element in their theories by demonstrating the non-teleological nature of evolution as a process. Humans were still evolving, both biologically and culturally. Speculating about the future of our species reinforced the plurality of our possible destinies and simultaneously allowed scientists to circumvent criticisms of teleological thinking.

In the 1960s, the most potent forms of speculation about the future came not from evolutionary scientists but the exploding science fiction industry. From *Star Trek* to Silver Age comics, humans ventured to other planets, explored distant galaxies, and on these journeys encountered endless forms of extra-terrestrial life. As much as Simpson enjoyed reading science fiction, he found frustrating the idea that humanity would someday encounter alien humanoids. To clarify, for readers “not as addicted... to science fiction,” he defined a humanoid as a “natural, living organism with intelligence comparable to man’s in quantity and quality, hence with the possibility of rational communication with us.”<sup>76</sup> As fun as it was to speculate about encountering a humanoid, though, Simpson remained professionally skeptical. “Even slight changes in earlier parts of the history would have profound cumulative effects on all descendent organisms through the succeeding millions of generations,” he wrote. “Thus the

<sup>64</sup> Dobzhansky, *Biological Basis of Human Freedom* (ref. 4), 6.

<sup>65</sup> On the importance of cultural relativism to anthropological theory after the Second World War and the lionization of Franz Boas, see Teslow, *Constructing Race* (ref. 2).

<sup>66</sup> Simpson, *Meaning of Evolution* (ref. 33), 337.

<sup>67</sup> George Gaylord Simpson, *Tempo and Mode of Evolution* (New York: Columbia University Press, 1944).

<sup>68</sup> Dobzhansky, *Biological Basis of Human Freedom* (ref. 4), 107–8.

<sup>69</sup> Dobzhansky, *Biological Basis of Human Freedom*, 121.

<sup>70</sup> Simpson’s *Meaning of Evolution*, 310, quoted in Dobzhansky, *Biological Basis of Human Freedom*, 134.

<sup>71</sup> Dobzhansky, *The Biology of Ultimate Concern*, 7.

<sup>72</sup> Pierre Teilhard de Chardin, *Phenomenon of Man*, introduction by Julian Huxley, trans. Bernard Wall (New York: Harper & Row, 1961).

<sup>73</sup> Letters G. G. Simpson to A. J. Cain, 19 April 1971, and 10 June 1971, George Simpson Papers, Ms. Coll. No. 31, Series #1, Folder: Cain, Arthur J. 1954–1982, American Philosophical Society, Philadelphia, PA [hereafter “Simpson Papers”].

<sup>74</sup> See Simpson Papers, Series #1, Folder: “Hooijer, Dick A.”

<sup>75</sup> Letter Simpson to Dobzhansky, 7 November 1966, Series #1, Folder: Dobzhansky, Theodosius #1, Simpson Papers.

<sup>76</sup> George Gaylord Simpson, “The Nonprevalence of Humanoids,” *Science* 143, no. 3608 (1964): 769–54, on 771.

existence of our present species depends on a very precise sequence of causative events through some two billion years or more. Man cannot be an exception to this rule. If the causal chain had been different, *Homo sapiens* would not exist.”<sup>77</sup> Simpson concluded by confidently stating that no humanoids existed elsewhere in the solar system and that even non-humanoid extraterrestrial life was implausible. Beyond the solar system, he thought life in another form might exist, but because of the contingent past of our evolution and theirs, humans would be unlikely to ever encounter those other forms. If we did, he continued, we would certainly find ourselves incapable of communicating with them.<sup>78</sup> Rather than supporting the expenditure of taxpayer dollars on looking for alien life, he urged readers to consider the benefits of investing a bit more money on a “sober scientific program” exploring the “systematics and evolution of earthly organisms.”<sup>79</sup> In an era where molecular biologists were garnering increasingly financial support, Simpson’s plea illustrates the pragmatic dilemma facing scientists who needed funds for research on whole organisms (whether extant or extinct). It also provides a potential key for understanding why, beyond ideological conviction, organismal biologists benefitted from a science that engaged with members of the general public on a national stage.

Dobzhansky did not read science fiction, but he was equally skeptical of finding intelligent life on other planets and for similar reasons.<sup>80</sup> With the creation of human culture on Earth, he wrote, “biological evolution had transcended itself.” Humanity adapted “to culture” as much as culture became the main means by which humans have shaped the natural world in which we live.<sup>81</sup> No matter how strong natural selection might be, biological evolution still took generations to spread a mutation through an entire species. A new *idea*, though, could spread far more quickly. He contended, like Simpson, that this amazing capacity evolved as a result of a long series of selective moments, both biological and cultural. In each case, the new mutations and gene combinations had spread because they were “beneficial at the times and places when and where they were selected, to our remote ancestors who were in some respects quite different from ourselves.”<sup>82</sup> On another planet, with radically different ecologies and selective pressures, this process could never be repeated.<sup>83</sup> In other words, a series of unusual circumstances had led to a unique combination of biological and cultural evolution that defined our universal human nature. This past evolutionary trajectory, in turn, provided the basis by which humanity’s destiny rested in our future decisions.

In subsequent decades, fossil discoveries would offer an even more intricate evolutionary picture in which brain size, tool use, and ecological adaptation changed according

to different timelines. These new fossils brought into serious question the idea of a mostly linear hominid legacy, but left the future open-ended.<sup>84</sup> With sufficient time, humanity might evolve in different directions, but only if environmental and cultural conditions changed radically—if humans, perhaps, traveled to distant worlds or built space colonies.<sup>85</sup> But even this speculative possibility would vanish if in the meantime we brought about our own demise.

### Dismal Alternatives

Hopeful visions of a universal human nature underpinning a bright future for all came under attack by the mid-1970s from multiple directions that became more powerful in subsequent decades (Figure 4). To begin with, not everyone agreed that human evolution was indeed ongoing. Scientists like psychologist Charles E. Osgood feared that human nature had become fixed at the moment that humans became human and learned to wield spears and knives. (For him, tool use and manufacture, especially of weapons, were important markers of the transition to humanity.) Technology had stopped the progress of physical and mental evolution, which explained our incapacity for rational self-control in the face of nuclear proliferation and our continued destruction of Earth’s fragile ecosystem. A second line of skepticism came from a grass-roots growth of conservative Christianity, both evangelical and Catholic. From this perspective, evolutionary theory throughout the twentieth century had advanced a secular account of humanity’s development divorced from God’s final reckoning (precisely Dobzhansky’s concern a decade earlier). In these alternative constructions of the future awaiting all humanity, our imminent demise loomed large.

In his 1962 treatise, *An Alternative to War and Surrender*, Osgood argued that Americans must let go of our “Neanderthal mentality,” and adopt more cooperative strategies of rational behavior.<sup>86</sup> By initiating small gestures of trust, he reasoned, policy makers could break vicious cycles of escalating mistrust. Osgood called his theory GRIT, for Graduated Reciprocation In Tension-reduction. He suggested that by consciously adopting psychological strategies that fostered trust, individuals and governments alike would be able to escape the raw emotional contests that reduced complex issues to simplistic dualisms. It was long past time, Osgood contended, to transition from a psychology conditioned by our dark evolutionary past into a more hopeful, rational future.

The view that human nature was technologically out of date extended also to students of animal behavior. Take, for example, ethologist Konrad Lorenz and his enduringly popular *On Aggression*, translated into English in 1966.<sup>87</sup>

<sup>84</sup> On the power of visualizations of human history, see Veronika Lipphardt and Marianne Sommer, “Visibility Matters: Diagrammatic Renderings of Human Evolution and Diversity in Physical, Serological and Molecular Anthropology,” *History of the Human Sciences* 28, no. 5 (2015): 3–16.

<sup>85</sup> Hermann J. Muller, “The Guidance of Human Evolution,” in *Evolution After Darwin: II. The Evolution of Man*, ed. Sol Tax (Chicago: University of Chicago Press, 1960), 423–62, on 457.

<sup>86</sup> Charles Egerton Osgood, *An Alternative to War and Surrender* (Urbana, IL: University of Illinois, 1962); see also Paul Erickson, Judy L. Klein, Lorraine Daston, Rebecca Lemov, Thomas Sturm, and Michael D. Gordin, *How Reason Almost Lost its Mind: The Strange Career of Cold War Rationality* (Chicago: University of Chicago Press, 2013), 81–106.

<sup>87</sup> Konrad Lorenz, *On Aggression [Sogenannte Böse]*, trans. Marjorie Kerr Wilson (New York: Harcourt, Brace & World, 1966).

<sup>77</sup> Simpson, “The Nonprevalence of Humanoids,” 773.

<sup>78</sup> Simpson, “The Nonprevalence of Humanoids,” 774–75.

<sup>79</sup> Simpson, “The Nonprevalence of Humanoids,” 885.

<sup>80</sup> Theodosius Dobzhansky, “Darwinian Evolution and the Problem of Extraterrestrial Life,” *Perspectives in Biology and Medicine* 15, no. 2 (1972): 157–75.

<sup>81</sup> Dobzhansky, “Darwinian Evolution and the Problem of Extraterrestrial Life,” 171.

<sup>82</sup> Dobzhansky, “Darwinian Evolution and the Problem of Extraterrestrial Life,” 174.

<sup>83</sup> Dobzhansky was especially keen to dismiss deterministic theories of evolution, including Bernhard Rensch, *Biophilosophy* (New York: Columbia University Press, 1971) and Lev Semenovich Berg’s theory of autogenesis in *Nomogenesis: Evolution Determined by Law* (Cambridge, MA: MIT Press 1969 [1926]).



In it he wrote that humans lacked an evolved capacity for reckoning with our newfound ability to kill at a distance with the aid of missiles and bombs. He reasoned that when antagonists never faced each other they could not signal submission and thus could not trigger evolved mechanisms for de-escalating conflict. Yet again, our technological future worked at odds with our evolutionary past.

When Osgood quipped, “Perhaps Modern Man, with his head stuck in the sky, still has Neanderthal feet that are stuck in the mire,” he feared the fate awaiting humanity was likely to be a post-apocalyptic scramble back to civilization rather than an international collaborative jaunt through the stars. Lorenz feared a similar fate, unless our understanding of human behavior could be used to control our worst behavioral drives. For both Osgood and Lorenz, the biological essence of what it meant to be human had been fixed in the evolutionary past, brought to a grinding halt by the development of culture and early humans’ capacity to remake the environments in which they lived. This paradox of the later Cold War—nature as past, nurture as future—proved quite resilient. At the same moment evolutionary biologists argued that human futures were unbounded, physicists and others (like Osgood) generated specters of scientific end times in a nuclear winter or the bombing of cities. Far from certain, the future needed protecting.

Beyond weapons, environmental “doomwatchers” argued that the fate of humanity was closely linked to the future of Earth’s imperiled ecosystems. Because of this tight connection, scientists like Paul Ehrlich, Barry Commoner, and Garrett Hardin suggested that humans were systematically wrecking the environment on which our species’ survival depended. Policymakers needed to mount a “wholistic, urgent, and radical attack” in defense of the earth’s fragile ecology.<sup>88</sup> Despite this shared broad concern, Ehrlich, Commoner, and Hardin came to loggerheads over how to best prevent the imminent demise of humanity’s environment.<sup>89</sup> Ehrlich’s preferred remedy was to slow population growth (in concert with reducing pollution and consumption), while Commoner instead favored dramatic changes in US economic policy, insisting that any effort to lower the birth rate was a dangerous canard. The battle became personal as well as public, spreading over the pages of *The Bulletin of the Atomic Scientists* in 1972.<sup>90</sup> An editorial in *Science* suggested that perhaps a fundamental difference in argumentative strategy might explain their inability to agree. Whereas Ehrlich had attempted to argue on purely scientific grounds, Commoner considered politics part of the equation, too.<sup>91</sup> Hardin approached their debate from again a different angle, giving a brief nod to the weight of Ehrlich’s scientific acumen, calling Commoner a skilled scientific popularizer, and maintain-

ing that both were necessary contributions to public discussions about environmental ethics (see Jason Oakes, this issue).<sup>92</sup>

The illimitable future of humanity posited by progressive evolutionists sat awkwardly, too, with apocalyptic concerns generated by an increasingly common belief among American evangelicals in the coming Armageddon.<sup>93</sup> Conservatives began attacking evolutionary theory as a leg supporting secular humanism in the late 1960s. A classic example of this strategy was Max Rafferty’s screed against secular humanism in education, *Guidelines for Moral Instruction in California Schools*.<sup>94</sup> Rafferty was the Superintendent of Public Instruction of the State of California and toward the end of this seventy-four-page document, he outlined the worst culprits whose publications advanced secular humanist thought in the United States: advocates of progressive education (John Dewey), sex education (Alfred Kinsey and *Playboy* magazine), behaviorism (B. F. Skinner and the science fiction heroes of the “radical Left”—including J. B. S. Haldane, Aldous Huxley, and George Orwell), the social sciences (Roland Van Zandt), Marxists (communists of all stripes, whether “Russian, Chinese, Cuban, or Yugoslav”), and evolutionists (Charles Darwin and John Dewey once again). Teaching the naturalistic basis to the “origins of man,” he wrote, was tantamount to teaching atheism and could be challenged legally.

Tim LaHaye played a key role in amplifying this perspective in the *Battle for the Mind* in 1980. LaHaye had worked with Henry Morris to found the Institute for Creation Research in San Diego.<sup>95</sup> Rafferty and LaHaye were both bothered by the assumption of gradual progress built into evolutionary theories of humanity. Rafferty and LaHaye also successfully juxtaposed evolutionary theory with a Christian worldview, even though for scientists and theologians like Dobzhansky and Teilhard de Chardin evolution had resonated strongly with spiritual belief, where both provided a progressive basis for the equality of all human cultures. Conservative evangelicals suggested evolutionary biologists had overstepped the bounds of proper science in claiming the right to pronounce on what it meant to be human without reference to God (which many scientists did, including Simpson, but certainly not all).

Secular and religious theories of technological, environmental, or spiritual self-destruction thus worked in concert to call into question whether a boundless future for humanity was attainable. The growing popularity of these theories throughout the 1970s evoked a far more pessimistic outlook on the essential nature of humanity than scientists immediately after the Second World War had hoped to convey.

<sup>88</sup> A. J. Miller, “Doomsday Politics: Prospects for International Co-operation,” *International Journal* 28, no. 1 (Winter 1972/1973): 121–133, on 124.

<sup>89</sup> James Walls, “Ecodoom,” *Family Planning Perspectives* 5, no. 1 (1973): 64.

<sup>90</sup> Paul Ehrlich and John Holdren, “Critique: One Dimensional Ecology,” *Bulletin of the Atomic Scientists* 28, no. 5 (May 1972): 16, 18–27; Barry Commoner, “On ‘The Closing Circle’: Response,” *Bulletin of the Atomic Scientists* 28, no. 5 (May 1972): 17, 42–56; John Holdren and Paul Ehrlich, “One-Dimensional Ecology Revisited: A Rejoinder,” *Bulletin of the Atomic Scientists* 28, no. 6 (June 1972): 42–45; Michael Egan, *Barry Commoner and the Science of Survival: The Remaking of American Environmentalism* (Cambridge, MA: MIT Press, 2007).

<sup>91</sup> Constance Holden, “Ehrlich versus Commoner: An Environmental Fallout,” *Science* 177, no. 4045 (1972): 245–47, on 247.

<sup>92</sup> Garrett Hardin, “Population Skeletons in the Environmental Closet,” *Bulletin of the Atomic Scientists* 28, no. 6 (June 1972): 37–41.

<sup>93</sup> Matthew Sutton, *American Apocalypse: A History of Modern Evangelicalism* (Cambridge: Harvard University Press, 2014).

<sup>94</sup> Max Rafferty, *Guidelines for Moral Instruction in California Schools* (Sacramento, CA: California State Department of Education, 1969).

<sup>95</sup> Christopher P. Toumey, *God’s Own Scientists: Creationists in a Secular World* (New Brunswick, NJ: Rutgers University Press, 1994), 82; Ronald Numbers, *The Creationists: From Scientific Creationism to Intelligent Design* (Cambridge: Harvard University Press, 2006 [1992]).

## Conclusion

The irritable reviewer of the 1962 CIBA Conference on *Man and His Future* called for an immediate moratorium on all conferences and meetings that contemplated the future of mankind. The speculations of scientists, he insisted, required fallible human beings to generalize beyond their areas of expertise. The results ran the gamut from controversial to perplexing. Given the plethora of publications on the topic in subsequent decades, his warning clearly went unheeded. For many of his peers, the ethical stakes of the future were too high to ignore.

As scientists embraced the future, they nevertheless left themselves open to criticisms from their colleagues and a public fearful that the future might not come at all. It would be easy to suggest that the increasingly violent struggle for Civil Rights, numerous high profile assassinations, political insurgencies, and the Vietnam War took their toll on the hopeful import of this postwar progressive ethic as ever more apocalyptic predictions snared the public eye by the end of the 1970s. Yet the hopes of postwar evolutionary theorists, too, had been forged in horror at the death toll of the First World War and the human rights atrocities that accompanied the second. The intellectual commitments of Huxley and Haldane, Dobzhansky and Simpson, even Ehrlich and LeHaye, were thus deeply tied to their changing understandings of the moral connotations of evolutionary theory. Each attempted, with his own emphasis, to correct what he believed were popular misunderstandings about human evolution.

These stakes are especially visible when connecting the past history of humanity's evolution to the possibility of shaping humanity's destiny. Liberal postwar evolutionary scientists sought to counter eugenic theories that implied members of various races of humans differed

constitutionally from each other. In defining a universal human nature that applied to all peoples, these scientists forged new futures based on the rhetoric of biological equality. They saw as apiece their efforts to shape the political implications of their science and the capacity of humanity as a species to uniquely control our future (and by implication the fate of all other species on the planet as well). These scientists reasoned that responsibility for safeguarding humanity and even life itself fell disproportionately on the shoulders of scientists who in turn were morally obligated to share the knowledge they were in the process of generating. Such knowledge, for Dobzhansky and Simpson, "must guide us if we are to control the future evolution of mankind."<sup>96</sup> Education and public engagement embodied the moral importance of actively participating in the creation of that better, future world. Put another way, the writings of these postwar evolutionary scientists demonstrate that although biological theories of human nature can (and have) been used to dehumanize, they have also been used to promote progressive anti-racist conceptions of humanity as a whole.

## Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

## Acknowledgements

Thank you to my co-panelists and commentator for the "Human Nature in the Public Eye" session at HSS for helpful discussion both in the fall of 2015 and as we revised our papers for publication: Jamie Cohen-Cole, Jason Oakes, Myrna Perez Sheldon, and Debbie Weinstein. The paper has also benefited from conversations with Michael Gordin and David Sepkoski, as well as feedback from Joe Martin, Rich Bellon, and two anonymous reviewers.

<sup>96</sup> Simpson, *Meaning of Evolution*, 337.