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2018

OUT OF ASIA: A GLOBAL HISTORY OF THE SCIENTIFIC SEARCH FOR THE ORIGINS OF HUMANKIND, 1800-1965

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Princeton, NJ : Princeton University

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OUT OF ASIA:

A GLOBAL HISTORY OF THE SCIENTIFIC SEARCH FOR THE ORIGINS OF HUMANKIND, 1800-1965

Emily Margaret Kern

A DISSERTATION

PRESENTED TO THE FACULTY

OF PRINCETON UNIVERSITY

IN CANDIDACY FOR THE DEGREE

OF DOCTOR OF PHILOSOPHY

RECOMMENDED FOR ACCEPTANCE

BY THE PROGRAM IN HISTORY OF SCIENCE

Advisors: Erika Lorraine Milam and Michael Gordin

April 2018

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ABSTRACT

From approximately 1800 until 1950, most evolutionists—as well as anatomists, philologists, and other men of science—agreed that the human race began in Asia (with the notable exception of Charles Darwin, who preferred Africa). Since the 1950s, however, essentially all paleoanthropologists have agreed that *Homo sapiens* evolved on the African continent. In my dissertation, I trace the intellectual and cultural genealogies of the 'out of Asia' and 'out of Africa' hypotheses of the geographic origins of humanity, framing both as sites for making knowledge claims about race, identity, human equality, and the history of humankind. In explaining this transition, I track the problem of human origins through diverse contexts, including nineteenth century theories of race and language, early twentieth century expeditions for the "missing link" in Java and Mongolia, interwar geological surveys in Kenya and Tanzania, and UNESCO's postwar quest to define a deracialized, unified, and peaceful humanity.

The history of paleoanthropology has been strongly influenced by studies of material culture, and the methodological turn towards studying the creation of fossils as scientific objects – a methodological choice that renders invisible the theoretical frameworks that underpinned the acquisition and interpretation of the fossils. By elucidating the theoretical frameworks that guided where expeditions went, how research funds were distributed, and how fragmentary evidence was interpreted in a variety of ways, I offer a radically new interpretation of the history of paleoanthropology in the past two centuries.

While grounded in the history of science, my study also intervenes in the study and practice of global history. Scientific efforts to make sense of human diversity and the natural history of the human species have been fundamentally shaped by the process of globalization over the past five hundred years. At the same time, I remain attentive to the reciprocal interactions between global or world history and paleoanthropology, which has been an important, if not always critically deployed, resource for global and world historians since the 1960s.

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INTRODUCTION

HISTORY AND THE ORIGINS OF HUMANITY

In January 1947, a book review appeared in the *Journal of Near Eastern Studies*. The title was "Asiatic Prehistory and the Origins of Man," and the focus was on four recent works (two by the same author) of paleontological and archaeological research from China, Burma, and other parts of mainland and archipelagic southeast Asia.[1] Rather than beginning immediately by dissecting the books at hand, the author, archaeologist Robert Braidwood, paused to review the present state of the field of Asian prehistory, and especially the theory "which claims Asia as the birthplace of mankind and civilization."[2]

Braidwood identified this theory as having two main dimensions. The first originated in the natural sciences, and was rooted in the work of Darwin's contemporaries Ernst Haeckel and Alfred Russel Wallace, who had both argued that the modern human species had emerged in Asia. This facet had been expanded, studied, and championed by paleontologists, physical anthropologists, and zoologists, whose work had borne fruit in the form of "such little direct evidence of an Asiatic center of human origin as does exist," including fragmentary fossilized

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[1] Robert J. Braidwood, "Asiatic Prehistory and the Origin of Man," *Journal of Near Eastern Studies* 6, no. 1 (January 1947), 30-42. Affiliated with the Oriental Institute of the University of Chicago, Robert Braidwood was one of the foremost specialists in the archaeology of western Asia and the prehistoric Agricultural Revolution. With his wife, archaeologist Linda Schreiber Braidwood, he co-led excavations in Iraq, Iran, and Turkey for more than thirty years, beginning in 1948. See Patty Jo Watson, "Robert John Braidwood, 1907-2003," *Biographical Memoirs of the National Academy of Sciences* (Washington DC: National Academy of Sciences, 2006). The books under review were: Hallam L. Movius, Jr., *Early Man and Pleistocene Stratigraphy in Southern and Eastern Asia* (Cambridge, 1944); Hellmut de Terra and Hallam L. Movius Jr., *Research on Early Man in Burma* (Philadelphia, 1943); Franz Weidenreich, *Giant Early Man from Java and South China* (New York, 1945); and Franz Weidenreich, *The Skull of Sinanthropus Pekinensis* (New York, 1943). These books were a little far afield from Braidwood's usual interests, both geographically and temporally, and the tone he takes in the introduction to the review suggests that the same was true for the assumed reading audience of the *Journal of Near Eastern Studies*: "This is a review article, written on the supposition that, while the books under consideration concern the most remote prehistoric ranges of time in the Far East, the readers of this journal may be interested in the present status of the theory which claims Asia as the birthplace of mankind and civilization." (30)

[2] Braidwood, "Asiatic Prehistory," 30.

apes from the Siwalik hills in India, and the mysterious near-human fossils *Pithecanthropus erectus*, or Java Man, found in 1891, and *Sinanthropus pekinensis*, or Peking Man, unearthed outside Beijing between 1927 and 1937.[3] The second dimension of the Asian origins hypothesis, Braidwood wrote, came from the social sciences and humanities, and the general intellectual milieu of the nineteenth and early twentieth centuries. Hegel's 1837 *Philosophie der Geschichte* further popularized the long-standing idea that Asia was the cradle of the human species, and this theory of *ex oriente lux* (a light from the East) appeared in many works of archaeology and art history in the nineteenth century; even philologists and political theorists developed complex theories that followed Hegel's logic, although what was meant by "Asia" could be, as Braidwood described it, "still more or less ambiguously defined."[4]

Beyond this intellectual tradition, Braidwood wrote, the reasons for choosing Asia as the location of humankind's first homeland were geographically obvious:

> The Americas and Australia may be disposed of on paleontological grounds, no early anthropoid or proto-anthropoid forms being available from these continents. Geographically, central Asia does form the approximate center of the great Eurafrasian land mass…[and] many of the more "primitive" living human beings are dispersed at some distance from it.[5]

Lastly, of course, there were the fossils: Peking Man and Java Man, "the most primitive fossil men available," and the large ape *Dryopithecus* from the Siwaliks. No intermediary forms had yet been found, either "in Asia or elsewhere," Braidwood remarked.

> The fact of the matter is that the best actual *evidence* so far offered by the Asiatic monocentrists is little more impressive than that offered in favor of Africa as an original homeland. Moreover, the earliest bona fide *Homo sapiens* fossil men come from Europe (which is, of course, much more intensely explored than either Asia or Africa).[6]

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[3] Braidwood, "Asiatic Prehistory," 30.
[4] Braidwood, "Asiatic Prehistory," 31.
[5] Braidwood, "Asiatic Prehistory," 31. Eurafrasian meaning Europe – Africa – Asia.
[6] Braidwood, "Asiatic Prehistory," 33.

These doubts notwithstanding, multiple generations of scientists and researchers before Braidwood had confidently asserted that Asia was the homeland of the human race—and had, in some cases, spent very large amounts of money to prove that this was the case by attempting to discover the "missing link." In fact, the Asian origins thesis was treated as almost certain long before any fossil evidence was discovered that could be said to "prove" the theory's correctness.

From approximately 1800 until 1950, most evolutionists—as well as anatomists, philologists, and other men of science—believed that the human race began in Asia (with the notable exception of Charles Darwin, who preferred Africa). Since the 1950s, however, essentially all paleoanthropologists have agreed that *Homo sapiens* evolved on the African continent. This dissertation explains how the "out of Asia" hypothesis came into being, and how the development of the "out of Africa" model could take place. In explaining this transition, I track the problem of human origins through diverse contexts, including nineteenth century theories of race and language, early twentieth century expeditions for the "missing link" in Java and Mongolia, interwar geological surveys in Kenya and Tanzania, and UNESCO's post-WWII quest to define a deracialized, unified, and peaceful humanity. Using a combination of published scientific and technical literature and archival material from more than twenty research sites in four countries, my project builds a nuanced portrait of the cultural and intellectual history of the two hypotheses, and examines how these ideas have shaped the story that we tell about the deep history of humankind.

In the case of the Asian origins hypothesis, I argue that linguistic and racial theories shaped the perception of human origins, even before an explicitly evolutionary framework had been elucidated. From the end of the eighteenth century onwards, scholars repeatedly collapsed the distinction between racial and linguistic categories, treating them as proxies for one another

that allowed scholars to trace historical relationships among different human groups. The specific racial-linguistic conflation came under fire in the mid-nineteenth century. The overarching logic of Asian origins, however, remained and was simply imported into newer theories that used additional climatological or zoological theories to buttress their central claim. When researchers in the natural sciences sought funding from institutions, governments, and private donors to hunt the "missing link" in the field, they invoked the enormous mass of theory and cultural scaffolding to support their requests, re-inscribing the scientific stature of the Asian origins hypothesis.

If theory directed where money, personnel, and public attention went, how can we explain the pivot to Africa in the late 1940s? In the same month Braidwood's review essay appeared, another group of researchers had gathered in Nairobi to tackle the same problems of human evolution and prehistory.[7] When early discoveries of provocatively human-like fossilized apes were announced in South Africa in 1925, scientists dismissed the finds as examples of either a primitive throwback or an abnormally robust monkey—either way, the fossils (now *Australopithecus africanus*, the oldest known early hominin from southern Africa) were not widely accepted as legitimate ancestors in the human family tree, in part because they were found in the wrong place. In 1947, however, the researchers who gathered in Kenya to attend the inaugural Pan-African Congress in Prehistory pooled the results of their geological, paleontological, anatomical, and archaeological studies and arrived at a very different conclusion

[7] K.P. Oakley, "First Pan-African Congress on Prehistory (Nairobi, January 1947)," NHM Library and Archives, Mss OAK Notes 8.1. See also L.S.B. Leakey and Sonia Cole, eds. *Proceedings of the Pan-African Congress on Prehistory, 1947* (Oxford: Basil Blackwell, 1952). The Congress was held from January 14-23, 1947, in Nairobi, with excursions out into the countryside to see important fossil sites, all organized by Louis Leakey. The body of over fifty congress participants represented twenty-six different countries and colonies, although the Union of South Africa and British East Africa were especially well-represented.

about the evolutionary origins of humankind. As one participant wrote in a report for his colleagues in London: "Does the available evidence indicate that *Homo sapiens* first appeared in Africa rather than in Asia? … In my personal view, yes."[8]

In the second half of the dissertation, I argue that the process of building the evidentiary base for an African origins hypothesis took approximately twenty years, and that the key transition moment was the First Pan-African Congress in Prehistory, organized by Louis Leakey in Nairobi in January 1947. Creating a plausible case for African origins required scientists to integrate geological, paleontological, and archaeological evidence from field sites in East Africa, Central Africa, and South Africa. Nearly all this evidence was gathered under contingent circumstances, by researchers who had come to Africa for regions unrelated to the study of human origins, and were operating with minimal budgets—a stark contrast to the well-funded and well-organized Asian expeditions. It was not until 1947 that these practitioners could come together to pool their results in one place. Underlying this data-gathering was systematic geological surveying—most of which was economic in nature and driven by the expansion of European colonial power in Africa. The geological surveys, the colonial governments, and the mining industry also provided regional employment for hobbyist prehistorians, who either conducted individual research during off-duty leave or paid close attention to the fossils or stone tools they unearthed while mapping phosphate deposits or surveying terrain for a new rail line. In short, the transition to "out of Africa" was made possible in the 1930s and 1940s by European imperialism and the necessity of developing export-oriented colonial economies.

By elucidating the theoretical justifications that guided where expeditions went, how research funds were distributed, and how fragmentary evidence was interpreted in a variety of

[8] K.P. Oakley, "The Origin of Man," 1. Undated but probably April 1947. Mss OAK Notes 8.1, Natural History Museum (London).

ways, I offer a new interpretation of the history of paleoanthropology in the past two centuries. The history of paleoanthropology has been strongly influenced by studies of the material culture of science, and the methodological turn towards studying the creation of fossils as 'scientific objects.' (It also contains a high proportion of triumphalist works written by practicing paleoanthropologists.) As a result, the historiography of human origins research has been almost entirely oriented towards the history of specific fossil finds, which correspondingly skews the literature towards the two areas of the world where the largest amount of prehistoric fossil research has been performed: in the nineteenth century, Europe, and in the twentieth century, Africa.[9] While these studies have contributed significantly to our understanding of how these fossils were interpreted as scientific objects, for the most part these authors have not addressed the larger intellectual framework in which these objects were interpreted and how evidence from

[9] On European prehistory, some examples include Marianne Sommer, *Bones and Ochre: The Curious Afterlife of the Red Lady of Paviland* (Cambridge: Harvard University Press, 2008); Marianne Sommer, "Mirror, Mirror on the Wall: Neanderthal as Image and Distortion in Early 20th Century French Science and Press," *Social Studies of Science* 36, no. 2 (April 2006), 207-240; and Chris Manias, *Race, Science, and the Nation: Reconstructing the Ancient Past in Britain, France, and Germany* (New York: Routledge, 2013). On African prehistory and paleoanthropology, see Christa Kuljian, *Darwin's Hunch: Science, Race, and the Search for Human Origins* (Johannesburg: Jacana Media, 2016); Martin Meredith, *Born in Africa: The Quest for the Origins of Human Life* (New York: Public Affairs, 2011); Peter Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1986); and Roger Lewin, *Bones of Contention: Controversies in the Search for Human Origins*, 2nd ed., with a new afterword (Chicago: University of Chicago Press, 1997). While not strictly related to the history of paleoanthropology, both Ann Fabian and Samuel Redman have explored the dynamics of collecting skeletons (of variable antiquity) for anthropological and anatomical study in American museums; see Ann Fabian, *The Skull Collectors: Race, Science, and America's Unburied Dead* (Chicago: University of Chicago Press, 2010) and Samuel Redman, *Bone Rooms: From Scientific Racism to Human Prehistory in Museums* (Cambridge: Harvard University Press, 2016). For the history of paleoanthropology in Asia, see Sigrid Schmalzer, *The People's Peking Man: Popular Science and Human Identity in Twentieth-Century China* (Chicago: The University of Chicago Press, 2008); Bert Theunnissen, *Eugène Dubois and the Ape-Man from Java: The History of the First 'Missing Link' and its Discoverer* (Dordrecht: Kluwer Academic Publishers, 1989); and Pat Shipman, *The Man Who Found the Missing Link: Eugène Dubois and His Lifelong Quest to Prove Darwin Right* (New York: Simon and Schuster, 2001). As will be discussed in chapter 1, I want to note here that Dubois may have been interested in proving Darwin "right" in the sense of "human evolution is plausible," but was not interested in establishing Darwin's theory about the location of the original cradle of the human species as correct – Dubois followed a different line of reasoning, but it would be less catchy to subtitle a book "…and his Lifelong Quest to Prove Ernst Haeckel Right."

individual finds was incorporated into a holistic model that sought to explain the long history of the human species on earth.[10] This intellectual framework overwhelmingly located the origins of the human species in Asia, but aside from Java Man—a fossil that was removed from public view by its cantankerous and reclusive discoverer—and Peking Man—a fossil that vanished, apparently destroyed, in World War II—there have been few major fossils from Asia to attract the attention that historians and popular science writers have bestowed on European and especially African finds.[11]

Part of the challenge of the fossil-centric paleoanthropological narrative is that it tends to reify the evidentiary status and to make the evolutionary meaning of fossils appear self-evident.

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[10] A recent and very welcome exception is Marianne Sommer's *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2016), which approaches the field through the lens of scientific biography, using Henry Fairfield Osborn, Julian Huxley, and Luca Cavalli-Sforza as its main focal points.

[11] The preponderance of fossil-centered accounts of paleoanthropology is partly a reflection of the book-writing habits of several major practitioners, including Louis Leakey, Raymond Dart, and Donald Johanson; see L.S.B. Leakey and Vanne Morris Goodall, *Unveiling Man's Origins: Ten Decades of Thought about Human Evolution* (Cambridge, MA: Schenkman Publishing Co., 1969); Raymond Dart with Dennis Craig, *Adventures with the Missing Link* (New York: Harper & Brothers, 1959); Donald Johanson and Maitland Edey, *Lucy: The Beginnings of Humankind* (New York: Simon and Schuster, 1981); Donald Johanson and James Shreeve, *Lucy's Child: The Discovery of a Human Ancestor* (New York: Morrow, 1989); Ian Tattersall, *The Fossil Trail: How We Know What We Think We Know about Human Evolution* (New York: Oxford University Press, 1995); Ian Tattersall, *The Strange Case of the Rickety Cossack and Other Cautionary Tales from Human Evolution* (New York: Palgrave Macmillan, 2015); and Chris Stringer and Robin McKie, *African Exodus: The Origins of Modern Humanity* (New York: Henry Holt & Co., 1996). Science writers and some historians have followed in this vein: see Peter Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1986); Roger Lewin, *Bones of Contention: Controversies in the Search for Human Origins*, 2nd ed., with a new afterword (Chicago: University of Chicago Press, 1997); Lydia Pyne, *Seven Skeletons: The Evolution of the World's Most Famous Human Fossils* (New York: Viking, 2016); Martin Meredith, *Born in Africa: The Quest for the Origins of Human Life* (New York: Public Affairs, 2011); and Pat Shipman, *The Man who Found the Missing Link: Eugène Dubois and His Lifelong Quest to Prove Darwin Right* (New York: Simon and Schuster, 2001). There has been and continues to be exciting work in paleoanthropology taking place in South, East, and southeast Asia, especially in India, the People's Republic of China, and in Indonesia. For whatever reason, though, these fossils do not make a significant appearance in the history of paleoanthropology literature, certainly not the way that the Taungs Baby, Lucy, Zinj, or other famous African fossils of the twentieth century have. Some of this may be a side effect from the influence of charismatic researchers with a good eye for publicity, e.g. Louis Leakey. (Another likely element is limited ability on the part of many Anglophone writers to engage with sources written in Mandarin, for example.)

There is a tendency (especially marked in popular accounts) to treat hominin fossil discoveries as immediate smoking guns that "proved" a certain location was essential to the emergence of the human species. In the case of the Asian origins hypothesis, the concept antedated the discovery of any fossilized hominin material in the region; nineteenth-century scholars did not consider it necessary to have the fossils in hand to begin thinking about questions of human origins and trying to find evidence that would allow those questions to be answered. Furthermore, because some key early fossil finds that were later incorporated into the African origins hypothesis were discovered ten or twenty years before that became the dominant theoretical orientation in paleoanthropology, focusing on these fossils without attending to the larger theoretical framework in which they did not properly fit makes it difficult to explain why their importance went "unrecognized" for so long.[12]

It is not as if fossil specimens whisper their secrets into scientists' ears—these finds must be interpreted by individual researchers, who interpret what they observe according to the prevailing theories describing what is plausible and what is not. The attention paid to hominin fossil finds serves to naturalize their acceptance and status as valid pieces of scientific evidence, and makes their integration and interpretation as a part of the human evolutionary puzzle seem straightforward—rather than the achievement of intense scientific work.

I also make an intervention in the history of race and science, engaging with the long history of conflict between monogenist (single-origin) and polygenist theories of human

[12] Both Peter Bowler and Ian Tattersall have argued that the emergence of the modern evolutionary synthesis led to a reconsideration of the nature of species difference and thus made it possible for *Australopithecus* to be brought into the human ancestral tree. See Peter Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1986) and Ian Tattersall, *The Strange Case of the Rickety Cossack and Other Cautionary Tales from Human Evolution* (New York: Palgrave Macmillan, 2015). While I agree that the synthesis played a role, I argue that it was not sufficient to explain the complete geographical reorientation of human evolutionary origins from Asia to Africa; see discussion in chapter 3.

evolution, which were recapitulated at intervals in the historical record, each time with different political implications.[13] The first half of the dissertation engages with how orientalism and race were intertwined in theories of human origins, while the second section explores how new political and scientific norms around race were established after World War II, albeit with significant historical continuities across the caesura of 1945. De-centering the fossils makes visible the strongly interdisciplinary history of paleoanthropology, which has drawn on expertise from many different scientific specialties and has influenced intellectual developments far beyond the boundaries of the subfield. I draw on the history of philology, linguistics, and archaeology to explore how researchers in human evolution used ideas, evidence, and methods from philology and linguistics, from anthropology and ethnology, and from archaeology and antiquarian studies to work backwards from the known history of humanity to its origin point, rather than moving forward in time from the ape to the human.[14]

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[13] On race and science, see for example Elazar Barkan, *Retreat of Scientific Racism: Changing Concepts of Race in Britain and the United States Between the World Wars* (New York: Cambridge University Press, 1992); George W. Stocking, Jr. *Race, Culture, and Evolution: Essays in the History of Anthropology* (Chicago: University of Chicago Press, 1982); Andrew S. Curran, *The Anatomy of Blackness: Science and Slavery in an Age of Enlightenment* (Baltimore: Johns Hopkins University Press, 2011); Colin Kidd, *The Forging of Races: Race and Scripture in the Protestant Atlantic World, 1600-2000* (New York: Cambridge University Press, 2006); Adrian Desmond and James Moore, *Darwin's Sacred Cause: Race, Slavery, and the Quest for Human Origins* (London: Allen Lane, 2009); Jenny Reardon, *Race to the Finish: Identity and Governance in an Age of Genomics* (Princeton: Princeton University Press, 2005); Tracy Teslow, *Constructing Race: The Science of Bodies and Cultures in American Anthropology* (New York: Cambridge University Press, 2014); Donna Haraway, "Remodeling the Human Way of Life: Sherwood Washburn and the New Physical Anthropology, 1950-1980," in *Primate Visions: Gender, Race and Nature in the World of Modern Science* (New York: Routledge, 1989), 186-230; and Perrin Selcer, "Beyond the Cephalic Index: Negotiating Politics to Produce UNESCO's Scientific Statements on Race," *Current Anthropology* 53, no. S5, The Biological Anthropology of Living Human Populations: World Histories, National Styles, and International Networks (April 2012), S173-S184.

[14] See, for example, Urs App, *The Birth of Orientalism* (Philadelphia: University of Pennsylvania Press, 2009); Suzanne Marchand, *German Orientalism in the Age of Empire: Religion, Race, and Scholarship* (New York: Cambridge University Press, 2007); Léon Poliakov. *The Aryan Myth: A History of Racist and Nationalist Ideas in Europe*, trans. Edmund Howard (New York: Basic Books, 1974); Maurice Olender. *The Languages of Paradise: Race, Religion, and Philology in the Nineteenth Century* (Cambridge: Harvard University Press, 1992); Colin Kidd, *The World of Mr. Casaubon: Britain's Wars of Mythography, 1700-1870* (Cambridge: Cambridge University Press, 2016); James Turner, *Philology: The*

One scientific field that emerged as critical for understanding this history is geology, and this connects the story of the study of the evolution of the human species to new literature in global history, including the history of industrialization and capitalism.[15] Geological surveys were key players in the emergence of the African origins hypothesis, since they provided organizational and financial infrastructure for basic research that uncovered critical data on the geological history of certain regions and brought interested researchers into the field, who could then conduct research on their own time or simply pay attention to potsherds and bones that turned up while exploring a limestone deposit for the expansion of a mine, or studying the course of a waterway that would irrigate colonists' farmland. There was a major increase in geological surveying in the interwar period, in large part because the experience of industrialized conflict in the First World War had made it manifestly obvious to the leading international powers that their ability to successfully fight future conflicts was going to be contingent on their access to key mineral resources, especially oil, petroleum, and coal.[16] While the geological surveys were

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Forgotten Origins of the Modern Humanities (Princeton: Princeton University Press, 2014); and Bruce Trigger, *A History of Archaeological Thought*, 2nd ed. (New York: Cambridge University Press, 2008). On the history of early nineteenth-century anthropology and ethnology (the latter term being more accurate to the period), see: Martin S. Staum, *Labeling People: French Scholars on Society, Race, and Empire 1815-1848* (Montreal: McGill-Queen's University Press, 2003); Andrew Zimmerman, *Anthropology and Antihumanism in Imperial Germany* (Chicago: University of Chicago Press, 2001); Alice Conklin, *In the Museum of Man: Race, Anthropology, and Empire in France, 1850-1950* (Ithaca: Cornell University Press, 2013); Henrika Kuklick, ed., *A New History of Anthropology* (Malden, MA: Blackwell Publishers, 2008); and Sadiah Qureshi, *Peoples on Parade: Exhibitions, Empire, and Anthropology in Nineteenth Century Britain* (Chicago: University of Chicago Press, 2011).

[15] On WWI and the interwar global oil market, see Gregory P. Nowell, *Mercantile States and the World Oil Cartel, 1900-1939* (Ithaca: Cornell University Press, 1994), and Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (New York: Verso Books, 2011). On technology change and WWI, see David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (New York: Oxford University Press, 2007). My thinking has been heavily influenced by the work of Jürgen Osterhammel, *The Transformation of the World: A Global History of the Nineteenth Century* (Princeton: Princeton University Press, 2014) and Sebastian Conrad, *What Is Global History?* (Princeton: Princeton University Press, 2016), as well as by Conrad's *Globalization and the Nation in Imperial Germany*, trans. Sorcha O'Hagan (New York: Cambridge University Press, 2010).

[16] The best books on resource management, globalization and industrialization, and the nation-state that I have encountered are both about China specifically; see Shellen Xiao Wu, *Empires of Coal: Fueling*

particularly important for data gathering in East and South Africa, the Chinese Geological Survey and the Geological Survey of the Netherlands Indies (Indonesia) both participated in hominin fossil research in the interwar period, and key discoveries were made by researchers affiliated with each institution—although, unlike their counterparts in Uganda, Kenya, or Tanzania, the paleoanthropologists in China and Java received special external funding from private foundations to support their hominin excavations.[17] Although this is a dissertation about rare hominins and not about coal, oil, manganese, or limestone, the geology thread of the story adds a new angle to existing literature on global expansion and economic integration (with its many inequalities, discontinuities, and peculiar patterns of flow), and points to a powerful intersection between the literatures in the history of science, the history of capitalism, and global history.

Scientific efforts to make sense of human diversity and the natural history of the human species have been shaped by the process of globalization over the past five hundred years.[18] In

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China's Entry into the Modern World Order, 1860-1920 (Stanford: Stanford University Press, 2015) and Grace Yen Shen, *Unearthing the Nation: Modern Geology and Nationalism in Republican China* (Chicago: University of Chicago Press, 2014).

[17] These were the Rockefeller Foundation in China and the Carnegie Institution of Washington in the Netherlands Indies; see discussion in chapter 2.

[18] In attending to this dynamic, my work has been shaped by other scholars working on global science, including Michael Adas, *Machines as the Measure of Men: Science, Technology, and Ideologies of Western Dominance* (Ithaca: Cornell University Press, 1989); Harold J. Cook, *Matters of Exchange: Commerce, Medicine, and Science in the Dutch Golden Age* (New Haven: Yale University Press, 2007); Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004); Marwa Elshakry, "When Science Became Western: Historiographical Reflections," *Isis* 101, no. 1 (March 2010), 98-109; Sujit Sivasundaram, "Sciences and the Global: On Methods, Questions, and Theory," *Isis* 101, no. 1 (March 2010), 146-158; Gyan Prakash, *Another Reason: Science and the Imagination of Modern India* (Princeton: Princeton University Press, 1999); Michael Gordin, *Scientific Babel: How Science Was Done Before and After Global English* (Chicago: University of Chicago Press, 2015); and Helen Tilley, *Africa as a Living Laboratory: Empire, Development, and the Problem of Scientific Knowledge, 1870-1950* (Chicago: University of Chicago Press, 2011). Lastly, Samuel Moyn and Andrew Sartori, eds. *Global Intellectual History* (New York: Columbia University Press, 2013) has been a useful resource for considering the range of approaches that are possible in global history, and for exploring how human origins as a specific type of intellectual problem has been shaped by global political and cultural dynamics.

practical terms, this dissertation scales up and down from the history of a continent to the history of a single paleontological dig site while engaging with the history of Asia, Africa, Europe, and North America, and covering a temporal range of approximately two centuries. At the same time, I remain attentive to the reciprocal interactions between global or world history and paleoanthropology, which has been an important, if not always critically deployed, resource for global and world historians since the 1960s.[19] In short, my point is that the idea of human origins research as unifying and inherently global itself has a history.

The problem of human origins required researchers to think holistically about all the peoples of the Earth, to understand patterns of selection, migration, competition, and replacement on a world-wide scale, and to conduct research in many disparate locations. At the same time, these researchers almost all hailed from a small handful of countries in Europe and North America. Thus, it is impossible to conceptualize this project without attending to both the global aspirations of my actors and the national contexts in which they conducted their research.

In the first chapter, "The Speaking Ape," I describe how the "out of Asia" conclusion was reached by a dizzying array of Western scholars, from the first century Jewish-Roman historian Josephus to Voltaire, Hegel, and Alfred Russel Wallace. When evolutionists began to think about the thorny problem of human origins in the nineteenth century, they had to assess whether these traditions had relevance for their biological hypotheses, especially given the dearth of non-European hominin fossils. If the acquisition of language was taken as the boundary line

[19] Leften S. Stavrianos, Loretta Kreider Andrews, Goerge I. Blankstein, Roger F. Hackett, Ella C. Leppert, Paul L. Murphy, and Lacey Baldwin Smith, *A Global History of Man* (Boston: Allyn and Bacon, 1962). This practice continues to the present: see chapter one, "Becoming Human" in the most recent edition of *Worlds Together, Worlds Apart*, a hallmark global history textbook published in the United States. See Robert Tignor, Jeremy Adelman, Stephen Aron, Peter Brown, Benjamin Elman, Stephen Kotkin, Xinru Liu, Suzanne Marchand, Holly Pittman, Gyan Prakash, Brent Shaw, and Michael Tsin, *Worlds Together, Worlds Apart: A History of the World from the Beginnings of Humankind to the Present*, new ed. (New York: W.W. Norton, 2014).

between human and non-human, then, scholars reasoned, tracing back the genealogy of language would help identify where the human species began. An additional advantage of this philological-evolutionary thesis was that it offered a compromise between the monophyletic and polyphyletic theories of human races. In this framework, humans had evolved from one common ancestor, but spread out from a center and achieved speech at different subsequent points in time, and therefore language could be used as a historical proxy for racial difference. The "Indo-European," "Indo-German," or "Aryan" peoples were closest to the center of the original human evolution, since the overarching racial logic placed western European peoples at the top of the racial hierarchy, and could thus be assumed to be the most advanced of the modern "races."

In the first chapter, I also address Darwin's hypothesis, advanced in his 1871 work *The Descent of Man*, that humans diverged from the apes in Africa, not Asia, exploring how Darwin reached this conclusion, and why his contemporaries disagreed. Ernst Haeckel, for instance, advanced the hypothesis that proto-human ape-men (*Affenmenschen*) had evolved in South Asia, possibly originating on the lost continent of Lemuria, which Haeckel located in the Indian Ocean. Haeckel's work inspired Dutch physician Eugène Dubois to undertake his own excavations while stationed with the Dutch colonial government on Java, and his discovery of a hominin femur and skull cap, subsequently dubbed "Java Man," swayed observers towards the Asian origins hypothesis.

While several small expeditions hunted fossils in southeast Asia in the first decade of the twentieth century, it was not until the 1920s that the hunt for the ancestors of humankind in Asia began in earnest. In the second chapter, "Extractive Magic," I examine three paleoanthropological expeditions that undertook fieldwork in China and Mongolia during the 1920s and 1930s: the Central Asiatic Expeditions of the American Museum of Natural History

(AMNH), Émil Licent and Pierre Teilhard de Chardin's expeditions to the Ordos and Yellow River valley, and the Chinese Geological Survey's excavations at Zhoukoudian. Despite the similarities in their programmatic goals, these three expeditions functioned very differently in terms of sources and amounts of research funding, organizational structures and institutional relationships, and especially positions in relation to the international political community and the government of republican China. For American Museum of Natural History president Henry Fairfield Osborn, the idea of Asian origins was particularly interesting because he believed it explained the history of the Aryan peoples, his highest exemplar of humanity. In the 1930s, his racial theories found an appreciative audience on both sides of the Atlantic, but especially within the Nazi elite.

When the Chinese Geological Survey group began unearthing hominin remains at Zhoukoutien in 1927, the research investment appeared to be justified, even though the researchers determined that the hominin bones, popularly known as "Peking Man," were proto-human, they were morphologically closer to modern humans than to a proposed ape-human last common ancestor. By mobilizing substantial financial resources and publicity in support of their work, these scientific expeditions solidified the status of the Asian origins hypothesis of human evolution, even though the "missing link" remained elusive.

Fossil-hunting in Asia in the interwar period was justified by over a century of historical and scientific discourse; there was no such justification available to fund paleontological and archaeological research work in Africa. The third chapter, "Our Ancestors, the Australopithecines?" explores the history of paleoanthropology and prehistoric archaeology in East Africa and South Africa in the 1930s and 1940s, including Raymond Dart and Robert Broom's excavations of the Australopithecines in South Africa and Louis Leakey's early

expeditions in Kenya and Tanzania. I argue that the first stage of the emergence of an "out of Africa" hypothesis was based on a combination of geological, paleontological, and archaeological data—not hominin fossil data alone—and that this work was made possible by systematic geological surveying, mostly oriented towards economic goals and driven by the expansion of European colonial power in Africa.

The chapter begins by considering the many kinds of archaeological, geological, and paleontological projects that researchers working in different parts of the continent undertook during the interwar period, focusing on the work of E.J. Wayland, a British geologist and engineer who served as the head of the Geological Survey of Uganda for over twenty years, before discussing the paleoanthropological work of Louis Leakey in Kenya and Tanzania, and of Raymond Dart and Robert Broom in South Africa. By considering Leakey, Dart, and Broom in the company of a relatively unknown figure like Wayland, I make clear how these men were all part of a much larger network of geologists, archaeologists, and paleontologists—some professionals, and some interested amateurs—who were working for colonial governments in Africa. I conclude by looking at the unification of the South African and East African evidence, and the rise of a "pan-African" thesis on human origins, beginning with British anatomist Wilfrid Le Gros Clark and his trip to South Africa to examine the Australopithecines in December 1946. From South Africa, Le Gros Clark traveled next to the Pan-African Congress in January 1947, where after conducting further close study of Leakey's Miocene *Proconsul* specimens, he took the podium to present a compelling case for reconsidering the Australopithecines not merely as a strange prehistoric ape, but as a hominin ancestor. However, as the reflections of Congress attendees make clear, it was not only the *Australopithecus* data that swayed their convictions that

Africa was the site of the putative "Garden of Eden," but rather a combination of geological, paleontological, and archaeological evidence.

The transition from "out of Asia" to "out of Africa" was by no means a smooth or total intellectual shift. In chapter four, "One Species, Under the Bomb," I trace two interlocking stories across the 1950s that illuminate the complicated negotiations that took place in both international and domestic political zones over human origins research and its meaning for understanding human-ness in the postwar era. New developments in radiometric dating technology made it possible to assign absolute (rather than just relative) dates to fossil specimens and archaeological finds, and to compare the absolute age of material evidence found in different parts of the world. Postwar paleoanthropology was shaped by the development of the atomic bomb via the creation of powerful new tools for dating first prehistoric human artifacts with carbon-14, and then volcanic sediments that contained hominin remains, using the potassium-argon dating technique. The development of radiometric dating techniques in the 1950s marked the first time when scientists could assign absolute ages to specimens, rather than relying on relative comparisons. This development strengthened arguments about the immense antiquity of hominin fossils found in Africa, and allowed researchers to begin building a rigorous chronology of prehistoric human settlement, first in Africa and then out into the rest of the world.

While radiocarbon was being used to date the silent artifacts of humanity's worldwide migrations, paleoanthropology was also being mobilized as the starting point for a new kind of history writing, conducted on a very large temporal and geographic scale. In the early 1950s, UNESCO proposed a collectively-written "Scientific and Cultural History of Mankind," from the evolution of the species to the present. When the draft text—which located the cradle of humankind in Africa—was circulated, the Soviet UNESCO delegation protested, because

Marxist theories of human development considered tool-making behavior to be the dividing line between humans and apes, and therefore the cradle of humankind was in Asia, because no African hominins had yet been found with stone or bone tools. By considering these two narratives side-by-side, it becomes clear how the political and technological arrangements of the 1950s made it possible to explore human history in new way, but also how great the gap was between the rhetoric of unity and internationalism, and the reality of research practices and the politics on the ground.

The final chapter considers the question of how the Asian origins hypothesis disappeared from both scientific and public memory. First, in the process of rejecting the Aryan race concept during and immediately after World War II, cultural anthropologists decisively de-coupled race and language. A relative strength of the Asian origins hypothesis had been its grounding in racial, linguistic, and physical (fossil and artifact) evidence; now, at the same moment that the body of African physical evidence had increased, racial and linguistic evidence were rejected as invalid. Second, Dart and Leakey both wrote and spoke extensively about their work in Africa during the 1950s, and consciously shaped popular narratives about paleoanthropology to center their own work, and to attract greater financial and institutional support. The Darwin centennial in 1959 coincided with Leakey's announcement of the discovery of *Zinjanthropus*, an extraordinarily ancient fossil hominin from Olduvai Gorge. Under these circumstances, it was easy to draw a straight line between Darwin's Africa prediction in 1871 and Leakey and Dart's discoveries in the twentieth century. Last of all, once decolonization began in earnest in 1960, studies of Africa as a continent took on a new political importance. Narratives of human origins made it clear that Africa had always had a place in world history; far from being marginal, the

continent's history was critical for understanding the history of the rest of the world. Fundamentally, telling the story of human origins is an act of history-writing.

By 1965, Africa sat at the nexus of research on human origins, institutionally, politically, and scientifically. When an international symposium of scientists gathered at the University of Chicago to discuss "The Origin of Man" in April 1965, the participants described their latest research on hominin paleontology, primate behavior, and human culture and language acquisition, and argued with each other—about where funding for future research would come from, about the dangers of treating theory as "fact," and about the nature of the boundaries that separated modern humans from their ape predecessors.

These practical and philosophical issues about research practice, the nature of evidence, and the central question of what differentiates humans from other animals shaped the development of the Asian origins hypothesis in the nineteenth century. They continue to be relevant for human evolution studies today.

Chapter 1. THE SPEAKING APE

EDEN, LANGUAGE, AND THE LOGIC OF ORIGINS IN THE NINETEENTH CENTURY

Long before Darwin or Haeckel, there was a significant European intellectual and cultural tradition that located the beginnings of culture, urban civilization, history, and language—the origins of humanity—somewhere in Asia. This conclusion was reached by a dizzying array of Western scholars, from the first century Jewish-Roman historian Josephus to Voltaire, Hegel, and Alfred Russel Wallace.[20] When evolutionists began to think about the thorny problem of human origins in the nineteenth century, they had to assess whether these traditions had relevance for their biological hypotheses, especially given the dearth of non-European hominin fossils.

Before the nineteenth century, scholars who operated within the boundaries of sacred history framed by the Old Testament believed the Book of Genesis established the origins of humankind.[21] In the early seventeenth century, Archbishop James Ussher painstakingly reconstructed a complete Biblical chronology, based particularly on the genealogy of the patriarchs, and concluded that the Creation of Adam and Eve had taken place in 4004 BCE, and the Great Flood had wiped the earth of all but Noah, his family, and his menagerie in 2349 BCE.[22] However, as European scholars – especially members of the Jesuit order – began to study ancient texts from China, Japan, and India acquired during religious, diplomatic, and trading missions to Asia, it began to become apparent that the texts described events and civilizations

[20] On the history of European scholarship on the location of Eden, see: Alessandro Scafi, *Mapping Paradise: A History of Heaven on Earth* (Chicago: University of Chicago Press, 2006); David Gange and Michael Ledger-Lomas, eds. *Cities of God: The Bible and Archaeology in Nineteenth Century Britain* (Cambridge: Cambridge University Press, 2013).
[21] The key verses are Genesis 2:8-14 for the location of Eden. On the European tradition of sacred history, covering everything elided between Josephus and Voltaire, see Daniel Lord Smail, *On Deep History and the Brain* (Berkeley: University of California Press, 2007), esp. ch 1.
[22] Urs App, *The Birth of Orientalism* (Philadelphia: University of Pennsylvania Press, 2009), 277.

that predated the Flood and even the Creation, according to Ussher's calendar. The obvious antiquity of Chinese and Japanese chronologies, or of Buddhist or Vedic texts from south Asia, threatened the stability of Biblically-oriented models of human universal history, since these well-attested histories and religious texts seemed to stretch back far beyond the boundaries of Genesis, and included humans who would, technically, pre-date Eve and Adam.

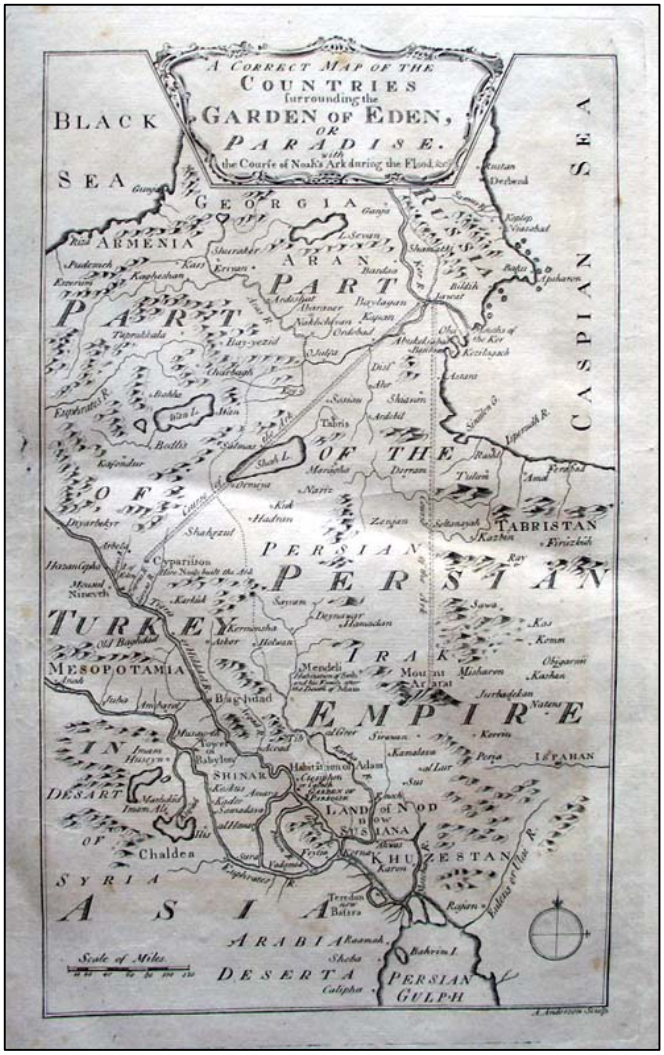


Figure 1 "A Map of the Countries Surrounding Paradise," in Flavius Josephus, *The Whole Genuine and Complete Works of Flavius Josephus, the Learned and Authentic Jewish Historian and Celebrated Warrior* (New York: William Durell, 1792). Princeton University Special Collections.

When men of science of the mid-nineteenth century wrestled with the problem of human evolution, both before and after the publication of Charles Darwin's *On the Origin of Species*, they turned to studies of the origin of language to assess evidence for the emergence of humankind from some extinct ancestor species. The intensive study of Asian languages, cultures, and texts – the field that ultimately became known as orientalism – produced sustained inquiries into the presumed existence of a first, primeval language, one from which all others (or all Eurasian others, at least) descended.[23] Certainly, some eighteenth century scholars – Voltaire and his contemporary Jean Sylvain Bailly, for example – were interested in disproving the authenticity of Biblical texts, while others, like William Jones, a British magistrate better known as the founder of Indo-European studies, wanted to use Asian texts to better prove the validity of the Bible, choosing to do so through the rigorous study of Sanskrit.[24] Jones' Biblical interests did not necessarily hold for his intellectual offspring, but the search for an original human language, accessed through the serious study of Sanskrit texts, persisted and grew in prominence in the early nineteenth century. Even as he disavowed the existence of a perfect, divinely guided *ur*-people, Hegel located the beginnings of history in Asia: "In Asia arose the Light of Spirit, and

[23] What these conceptualizations of 'the Orient' meant for the emerging nexus of power-knowledge and European colonialism has been discussed at length by Edward Said, and significantly nuanced by App, Suzanne Marchand, and Thomas Trautmann, among others. See Edward W. Said, *Orientalism,* 25th Anniversary ed. (1978; repr., New York: Vintage Books, 2003); Urs App, "William Jones' Ancient Theology," *Sino-Platonic Papers* 191 (July 2009), 1-136; App, *The Birth of Orientalism*; Suzanne Marchand, *German Orientalism in the Age of Empire: Religion, Race, and Scholarship* (New York: Cambridge University Press, 2007); Thomas R. Trautmann, *Aryans and British India* (Berkeley: University of California Press, 1997).

[24] On Bailly, see App, *The Birth of Orientalism*, ch 1; App, "William Jones' Ancient Theology," esp. 47-53; and David Allen Harvey, "The Lost Caucasian Civilization: Jean-Sylvain Bailly and the Roots of the Aryan Myth," *Modern Intellectual History* 11, no. 2 (2014), 279-306. On Voltaire, see App, *The Birth of Orientalism,* ch 1, especially 38-40, 74-76. On Jones, see App, "Jones' Ancient Theology"; Michael F. Robinson, *The Lost White Tribe: Explorers, Scientists, and the Theory that Changed a Continent* (New York: Oxford University Press, 2016): ch 6 (although Robinson draws heavily on App); James Turner, *Philology: The Forgotten Origins of the Modern Humanities* (Princeton: Princeton University Press, 2014), 93-99; and Trautmann, 52.

therefore the history of the World."[25] The philological tradition was a major contributor to both the original development and further sustaining of the 'out of Asia' hypothesis of human evolution, through the argument that the development of speech was what differentiated pre-human 'ape-men' (*Affenmenschen*) from modern *Homo sapiens.*[26]

An additional advantage of this philological-evolutionary thesis was that it offered a compromise between the monophyletic and polyphyletic theories of human races. In this framework, humans had evolved from one common ancestor, but spread out from a center and achieved speech at different subsequent points in time. The "Indo-European," "Indo-German," or "Aryan" peoples were closest to the center of the original human evolution, since the overarching racial logic placed western European peoples at the top of the racial hierarchy, and could thus be assumed to be the most advanced of the modern "races." This philological-biological link persisted even when prominent philologists and evolutionists, such as Thomas Henry Huxley and Charles Darwin, attempted publically and repeatedly to untangle the two concepts.

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[25] Georg Wilhelm Friedrich Hegel, *The Philosophy of History*, trans. J. Sibree, revised ed. (New York: Willey Book Co., 1944), 99. The reason I am using a mid-20th century translation of Hegel is because I first came across this reference ("In Asia arose the Light of Spirit," etc.) in a 1947 article by archaeologist Robert Braidwood reviewing the status of the out of Asia hypothesis of human origins (in the context of reviewing four recent works on Asian paleontology, paleoanthropology, and prehistory). Right on the cusp of the moment when the out of Africa hypothesis begins to really gather steam, here is Braidwood summing up more than two centuries of intellectual work in a book review, and directly quoting Hegel: "While paleontology yielded the main portion of such little direct evidence of an Asiatic center of human origin as does exist, the development of the theories held by the paleontologists must be seen in the general nineteenth- to early twentieth-century milieu. The theory of an Asiatic cradle was present in Hegel's *Philosophie der Geschichte* (1837); Asia contained the first of three main phases into which Hegel divided history." Robert J. Braidwood, "Asiatic Prehistory and the Origin of Man," *Journal of Near Eastern Studies* 6, no. 1 (Jan. 1947), 30-31.

[26] For an excellent history of the animal origins of language and the relationship between language studies and evolution, see Gregory Radick, *The Simian Tongue: The Long Debate About Animal Language*, (Chicago: University of Chicago Press, 2007), especially ch 1 and 2.

While the Asian origins of humanity may have been manifestly obvious to nineteenth century scientific observers, the power and scope of the hypothesis has not been as easy to discern for twentieth and twenty-first century historians of paleoanthropology. Part of the challenge in rendering the long history of the Asian hypothesis visible is that Charles Darwin, the charismatic megafauna of nineteenth century history of evolution scholarship, was one of the only major intellectual figures who did *not* champion an idea of Asian origins. If Darwin and his immediate circle of friends and supporters like Charles Lyell and Thomas Henry Huxley are taken as representative, the advocates of the Asian origins hypothesis begin to appear like a part of the intellectual and cultural fringe. When hominin fossil hunters like Eugène Dubois declared themselves defenders of Darwinian ideas, they were defending the concepts of natural selection and descent with modification – not Darwin's diffident claims about the possible African birthplace of the human species. Darwin's staunchest contemporary allies were still prepared to admit the great man might have gotten a few details wrong.

A second challenge comes from the polysemy of "language" in the historiography of evolution. Gregory Radick, for example, has written about the history of research into animal language, including Darwin's early attempts to establish that language capacity could stretch across the animal-human boundary.[27] Working from a different angle, Gillian Beer has added new depths to the understanding of Victorian scientific and literary culture through her work on the role of language, plot, and metaphor in Darwin's writings. [28] Beer's work offers a powerful vantage point on the metaphorical work of language and linguistic metaphors in Darwin, but it

[27] Radick, *Simian Tongue*.
[28] Gillian Beer, *Darwin's Plots: Evolutionary Narrative in Darwin, George Eliot, and Nineteenth Century Fiction* (Boston: Routledge & Kegan Paul, 1983); Gillian Beer, "Darwin and the Growth of Language Theory," reprinted in *Open Fields: Science in Cultural Encounter* (Oxford: Clarendon Press, 1996), 95-114.

does so while standing in the footprints of another group of historical actors, occluding how philologists were concerned with language as not only as a metaphor, but also as actual historical data for understanding human evolution.

To these two different approaches to "language" and Darwin, I add a third, by analyzing the uses of language as evidence itself in evolutionary theory, and the specific ways that philological evidence was used to trace the genealogy of the species, and accordingly to make claims about human evolutionary history and racial hierarchies – although virtually all this work was conducted by people other than Charles Darwin. As I show, philologists and ethnologists at the start of the nineteenth century believed in the value of using language to define groups and trace their histories and relationships.[29] In this model, a language was rooted in the bodies of the people who spoke it. After the publication of *On the Origin of Species* in 1859, philologists became interested in the metaphorical possibilities of Darwin's ideas, but they continued to consider how language could also be used literally to track evolutionary history since the emergence of the human species. Once again, this was a prominent intellectual problem, but not one that Darwin was particularly intrigued by.[30]

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[29] On race, language, and philology see: Léon Poliakov. *The Aryan Myth: A History of Racist and Nationalist Ideas in Europe*, trans. Edmund Howard (New York: Basic Books, 1974); Maurice Olender. *The Languages of Paradise: Race, Religion, and Philology in the Nineteenth Century* (Cambridge: Harvard University Press, 1992); Colin Kidd, *The World of Mr. Casaubon: Britain's Wars of Mythography, 1700-1870* (Cambridge: Cambridge University Press, 2016); and J.W. Burrow, "The Uses of Philology in Victorian England," in Robert Robson, ed. *Ideas and Institutions of Victorian Britain* (New York: Barnes and Noble, Inc., 1967), 180-204. On the history of early nineteenth-century anthropology and ethnology (the latter term being more accurate to the period), see: Martin S. Staum, *Labeling People: French Scholars on Society, Race, and Empire 1815-1848* (Montreal: McGill-Queen's University Press, 2003); Andrew Zimmerman, *Anthropology and Antihumanism in Imperial Germany* (Chicago: University of Chicago Press, 2001); Alice Conklin, *In the Museum of Man: Race, Anthropology, and Empire in France, 1850-1950* (Ithaca: Cornell University Press, 2013); Henrika Kuklick, ed., *A New History of Anthropology* (Malden, MA: Blackwell Publishers, 2008).

[30] C.f. Stephen G. Alter, *Darwinism and the Linguistic Image: Language, Race, and Natural Theology in the Nineteenth Century* (Baltimore: Johns Hopkins University Press, 1999), which takes the ideas in Beer and tries to analyze the work that linguistic metaphors and analogies do in Darwin's work, which is minimal (Darwin prefers a lot of other sorts of metaphoric language), and in other evolutionists' writings,

Most of the conclusions about evolution and the location of cradle of humankind that scientists drew in lectures and in print were speculative – but they were also spectacularly popular. Even as individual pieces of the Asian origins hypothesis were questioned, disproved, reconsidered or reframed, the central idea of Asian origins was sustained by the attention paid to the origins of the Indo-European language. The apparent stability of the overall hypothesis shaped the way that scientific investigations into the fossil evidence for human evolutionary origins were framed and undertaken. In the late nineteenth century, scientists proposed increasingly sophisticated theories to explain how changes in climate, or even the rise or subsidence of land masses, could have contributed to the divergent development of the human species, but these different theories again all presupposed an Asian origin. Before any evidence of the purported "missing link" between humans and apes was uncovered, the idea of Asian origins had become a scientific and popular shibboleth. In short: the "where" of human origins was antecedent to the "how."

Tracing Race and Language in the Early Nineteenth Century

At the end of the eighteenth century, the British administrator and orientalist William Jones arrived in India, ready to serve as a magistrate in the Bengal Supreme Court. Possessed of a voracious curiosity—on his journey out from Britain he composed a list of sixteen topics he wanted to learn more about, including Hindu and Muslim law, traditions concerning the Biblical Flood, the "History of the Ancient World," and "Best Mode of governing Bengal"—Jones also set out to learn Sanskrit. His goal was twofold: he believed Sanskrit would help him understand some of the existing legal traditions of the Indian subcontinent, but also that learning the

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which is sometimes substantial. The chief problem for Alter's argument is that in other evolutionists' works, discussions of language are not always metaphorical.

language would allow him to come closer to understanding "the lost language of Noah and Adam."[31] Jones' research into language spawned the field of Indo-European studies and comparative philology, and the search for the relationship between existing languages and some now-lost proto-language informed the way that European researchers conceived of the long history of humanity.[32] These linguistic re-tracings co-existed with other forms of ethnological analysis that classified human groups according to newly-created racial typologies. Specialists in anthropometry and craniology, as well as philology, attempted to quantify human difference and place different peoples on a hierarchical scale of development. This was a process that took on new political dimensions at the beginning of the nineteenth century, in the context of both imperial expansion and active debate around slavery and the trans-Atlantic slave trade.[33]

After arriving in India and undertaking extensive study in Sanskrit manuscripts, Jones presented his conclusions in a series of lectures – the Anniversary Discourses – delivered to the Asiatick Society of Bengal between 1786 and 1792.[34] He argued that there was "an immemorial affinity" between the Hindus, the Celts, the Greeks, the Japanese, and the Peruvians that Jones

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[31] Trautmann, 52. For the list of Jones' interests, see App, "Jones' Ancient Theology," 2-3.

[32] The term 'Indo-European' was used alongside 'Indo-German' and 'Aryan,' sometimes interchangeably, by one author, within the same paragraph; see Olender, 11. Indo-European is probably the most generally used term; the term Indo-German was mostly reserved to writers in the German principalities (or, after unification, the German empire) and 'Aryan' seems to have come into vogue in the mid-nineteenth century, although it has obviously had a much longer and darker subsequent history than the other two terms.

[33] See discussion in Andrew S. Curran, *The Anatomy of Blackness: Science and Slavery in an Age of Enlightenment* (Baltimore: Johns Hopkins University Press, 2011); Colin Kidd, *The Forging of Races: Race and Scripture in the Protestant Atlantic World, 1600-2000* (New York: Cambridge University Press, 2006); Adrian Desmond and James Moore, *Darwin's Sacred Cause: Race, Slavery, and the Quest for Human Origins* (London: Allen Lane, 2009); Conklin, *In the Museum of Man*; and Staum, *Labeling People.*

[34] See, for instance: William Jones, "Discourse on the Hindus (Third Anniversary Discourse, delivered February 2, 1786)," *Asiatick Researches* 1 (London reprint, 1801), 415-431; "Discourse on the Persians (Sixth Anniversary Discourse, delivered February 19, 1789)," *Asiatick Researches* 2 (London reprint, 1801), 43-66; and "Discourse on the Origin and Families of Nations (Discourse the Ninth, delivered February 23, 1792)," *Asiatick Researches* 3 (London reprint, 1796): 418-435. These texts are all reproduced in an appendix to Urs App, "Jones' Ancient Theology."

believed could only be explained if those cultures were all the descendants of some previous, unified culture.[35] "We may fairly conclude," wrote Jones, "that they all proceeded from some *central* country, to investigate which will be the object of my future Discourses…"[36] True to his word, in his Sixth Discourse, presented in 1789, Jones wrote that he had identified the site of the primeval history of the human race.[37] Thanks to insights from Mir Muhammed Husain, a Muslim Indian scholar of Jones' acquaintance, he had concluded that the ancestral home of the human species must have been Iran. Its central position in Eurasia made it much more likely that ancient Persia – Jones used the term interchangeably with Iran – could have "sent forth its colonies to all the kingdoms of Asia."[38] Underlying these assumptions was an even more fundamental claim, which Jones introduced in his Ninth Discourse, from 1792: that the "first race" of Persians and Indians "originally spoke the same language and professed the same popular faith."[39]

At the start of the nineteenth century, Indo-European studies found a congenial home in the intellectual capitals of Europe, especially in the conglomeration of the German principalities.[40] Jones' work, as well as the rich collection of Sanskrit manuscripts held in India House in London, caught the attention of the young German poet Friedrich Schlegel during a visit in 1801-02, and his 1808 *Essay on the Language and Wisdom of the Indians* helped launch a new discipline.[41] For German Romantics who had imbibed the ideas of Johann Gottfried Herder,

[35]App, "Jones' Ancient Theology," 89.
[36] App, "Jones' Ancient Theology," 89.
[37] Jones, "Discourse on the Persians (Sixth Anniversary Discourse, delivered February 19, 1789)," in App, "Jones' Ancient Theology," 93.
[38] App, "Jones' Ancient Theology," 105-106.
[39] William Jones, "Discourse on the Origin and Families of Nations (Discourse the Ninth, delivered February 23, 1792)," in App, "Jones' Ancient Theology," 107.
[40] See discussion in Marchand; Poliakov, 191-195; and Burrow, esp. 181-186.
[41] F. Max Müller, "Lecture IV. The Classificatory Stage," in *Lectures on the science of language: Delivered at the Royal Institution of Great Britain in April, May, and June 1861* (London: Longman, Green, Longman, and Roberts, 1861), 157; Olender, 7.

who argued that languages mapped onto nations or peoples – not just practically, but in a way that language represented some deeper spiritual linkage among members of a population – the story of a linkage between speakers of ancient Vedic languages and the modern German peoples was revolutionary.[42] Hegel likened the discovery of Indo-European to the discovery of a lost continent, establishing connections across time between distant places and peoples long independent of one another.[43] As the German Romantics – most notably Schlegel, as well as Franz Bopp, Jacob Grimm, and Wilhelm von Humboldt – took up the mantle of unearthing the lost Indo-European language, and resurrecting the prehistoric Indo-European tribes, they began to treat language as another marker of racial identity. Their ideas quickly spread throughout Europe.[44]

One prominent enthusiastic adherent was the French naturalist and zoologist Georges Cuvier. The chair of animal anatomy at the Muséum nationale d'histoire naturelle in Paris, Cuvier wanted to develop a rational system of natural classification for animals, organized according to major functional groups.[45] In his 1817 four-volume anatomical study, *La règne animal distribué d'après son organisation*, Cuvier described three chief races of the human species – the Caucasian, the Mongolian, and the Ethiopian – according to variations in physical form, including head shape, skin color, and aesthetic beauty.[46] The Ethiopian, or *la race nègre*,

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[42] Turner, 127-134. Johann Gottfried Herder is also a fascinating linchpin for the intersecting senses of 'language maketh the man' and 'language maketh the people/nation/race' – see discussion of Herder in Turner, 127-128, and in Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, rev. ed. (New York: Verso, 2006), 67-68.
[43] Poliakov, 195.
[44] Poliakov, 199.
[45] On Cuvier, see Toby Appel, *The Cuvier-Geoffroy Debate: French Biology in the Decades Before Darwin* (New York: Oxford University Press, 1987).
[46] Georges Cuvier, *La règne animal distribué d'après son organisation : pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée* (Paris : Chez Déterville, 1817), 94-99. "… la blanche, ou *caucasique*; le jaune, ou *mongolique*; la nègre, ou *éthiopique*." All translations EMK. Humans were by no means Cuvier's exclusive focus: human comparative anatomy took up nineteen out

was quickly dismissed. Cuvier concluded his one-sentence analysis by writing: "The tribes who compose this race have all remained in a state of barbarism."[47] No cultural, historical, or linguistic traits were ascribed to the Ethiopians, unlike the other two branches Cuvier described. Only the previous year, he had presided over the post-mortem dissection of Sara Baartman, a Khoisan woman from the Cape Colony brought to Europe to be exhibited as the "Hottentot Venus."[48] Although Cuvier described *la race nègre* as one of the three branches of humankind, this branch was presented as far less human than the others.

He spent the far more time on a thorough description of the Caucasian race, using linguistic arguments to distinguish between the principal branches of the race.[49] The Aramaic or Syriac branch, "always inclined to mysticism," had produced the Assyrians, the Chaldeans, the Phoenicians, the Jews, and the Arabs, while the Indo-Germanic-Pelasgian branch could lay claim to the honor of being both the oldest and the most heavily studied of the ancestral subdivisions of the Caucasian race.[50] The Mongolian race, too, was broken down into linguistic subdivisions. Both Tibetan and the languages spoken in the northern end of the Indian subcontinent, Cuvier wrote, were like Chinese, and "the peoples who speak them are not without resemblance to the other Mongolians in terms of their features."[51] The peoples of the Americas were difficult to characterize: their "red" skin color, black hair, and general lack of facial hair made Cuvier inclined to class them as a distant offshoot of the Mongolian race, but since the languages of the

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of five hundred pages in the first volume. Wading birds in the first volume alone got forty-five pages, as a point of comparison.

[47] Cuvier, 95.

[48] See Sadiah Qureshi, "Displaying Sara Baartman, the 'Hottentot Venus'," *History of Science* 42, no. 2 (June 2004), 233-257; and Christa Kuljian, *Darwin's Hunch: Science, Race, and the Search for Human Origins* (Johannesburg: Jacana Media, 2017), 81-82, 104.

[49] Cuvier, 95. "On peut distinguer les principales branches de cette race **par l'analogie des langues**." My emphasis.

[50] Cuvier, 95. "Pelasgians" refers broadly to the ancient, prehistoric, or pre-Classical indigenes of Greece.

[51] Cuvier, 98.

Americas were as "innumerable as the number of tribes," and bore no apparent relationship to either each other or to any of the languages of the Old World, Cuvier was unable to make any more definitive pronouncements.[52] Language similarities could fill in gaps where physical racial analysis failed, while linguistic similarities connected peoples, like the Hindustanis and the Germans, who would have otherwise been divided in a racial classification system based purely on either skin and hair color or geography. Apparently, similar syllable structure made similar facial structures more obvious, even to the trained anatomist's eye.

In London, British ethnologist James Cowles Prichard identified the races and nations of the world's peoples through a combination of physical characteristics like skin color and hair type, but used language as an additional marker that could show fine-grained distinctions between sub-groups, as well as establish their historical relationships to one another.[53] In his 1813 *Researches into the Physical History of Man*, Prichard also used language relationships, or the lack thereof, to explain how the indigenous populations of Australia, southern Africa, and the southern tip of South America, could be physically and culturally different from Europeans, while still being a part of the same species. The region bounded by the Nile in the west, the Ganges in the east, the Caspian Sea to the north, and the Indian Ocean to the south was most likely "the primitive abode of our species, in which alone therefore it can properly be considered as indigenous," since it was also the region in which "mankind first advanced to civilization."[54] Before this advance to civilization had taken place, certain tribes of fish-eating nomads had roamed away from the homeland, "into the distant parts of the earth," settling at the

[52] Cuvier, 99-100.
[53] James Cowles Prichard, *Researches into the Physical History of Man* (London: W. Phillips, 1813).
[54] Prichard, 554-555. Based on geographical clues, Prichard is describing basically the same region as William Jones did when he spoke about ancient Persia as the seat of the human race, although by setting the eastern boundary at the Ganges instead of, say, the Indus, Prichard also included Vedic India, which Jones had more or less excluded as the *original* homeland.

southernmost ends of the African and American continents and remaining, to the present day, in "nearly in their original unimproved condition…" These groups of people shared no similarities with European or Asian peoples in their "languages, manners, or superstitions," because, Prichard argued, "they went forth when language was as yet imperfectly formed, before manners had acquired any peculiar character, and previous to the age of idolatry."[55] African, Australian, and American languages were autochthonous, because the peoples in those regions emigrated early and then remained in their primitive state.

Prichard rejected the creeping influence of the biological race concept in ethnology. Instead, he treated the term 'race' as a baggy category for describing a group of people, synonymous with 'nation,' 'tribe,' and 'stock,' but still used language as a group identity marker in a similar manner as his more race-enthused colleagues.[56] His goal in writing his *Physical Researches* was to prove definitively that humans were all of the same species, and shared a single point of origin – which also let Prichard use his ethnological expertise to affirm the literal truth of the Biblical Genesis account. Prichard was one of the most prominent Anglophone advocates for the monogenesis of the human species in the early nineteenth century, along with the American naturalist, pastor, and slave-owner John Bachman.[57] Belief in the monogenetic origins of humankind did not mean that an individual also necessarily supported the abolition of

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[55] Prichard, 556.

[56] H.F. Augstein, "Aspects of Philology and Racial Theory in Nineteenth-Century Celticism: The Case of James Cowles Prichard," *Journal of European Studies* 28, no. 4 (December 1998), 355-371.

[57] Like Prichard, Bachman also believed the ancestors of modern humans had emerged in Central Asia, "between the 20th and 40th degree of North latitude, and the 90th and 110th East longitude." This country was "usually regarded as the land from which the progenitors of all the races of men first commenced their migrations." It was the same region where many species of plants and animals used by humans for food, clothing, transportation, and shelter could be found, and which Bachman claimed had been carried outwards by the early migrations of humanity, explaining their presence and use in many different parts of the world. The area described by latitude 20.0-40.0 N and longitude 90.0-110.0 E falls in the center two-thirds of the modern People's Republic of China. See John Bachman, *The Doctrine of the Unity of the Human Race Examined on the Principles of Science* (Charleston, SC: C. Canning, 1850), 171. Reprinted in Robert Bernasconi, ed. *American Theories of Polygenesis* (Bristol: Thoemmes, 2002), vol. 5.

slavery, or believed in the equality and humanity of all people – a point that would become increasingly important in the second half of the nineteenth century. For monogenists like Prichard, Bachman, and even Cuvier, the existing human races had diverged from one another over time; the races had a historical relationship. For other contemporary ethnologists, explaining the myriad forms of human diversity required polygenesis – the separate creation for the different racial types of humankind.

Polygenists believed the existing human races were separately created, and should be considered separate species, arranged in a hierarchy with the white or 'Caucasian' races placed at the top. By definition, polygenists were not interested in establishing a single point of origin for the emergence of modern humanity, although the use of the term "Caucasian" shows that the Asian origins hypothesis was present in the polygenist explanatory framework too, dating back to the work of German race theorist Johann Friedrich Blumenbach, who located the emergence of the 'white races' in the Caucasus mountains. Blumenbach's most famous work, *De generis humani varietate nativa* (*On the Natural Varieties of Mankind*), published in 1775, was written in defense of Biblically-backed monogenism, but his framing of race as a state of quantifiable physical difference served the polygenist cause as well, since later authors could easily drop the underlying monogenesis claim and focus on deploying the classifications Blumenbach had proposed.[58] In any event, even a polygenist could still claim to trace the origin of white Europeans back to Asia.

Samuel Morton was the most prominent American polygenist of his generation, with a significant readership in the Anglophone world on both sides of the Atlantic. In the introduction to his 1839 work *Crania Americana*, he distinguished between the two chief systems of

[58] Curran, 169-173.

classifying the human species: the first, the physical, grouped humankind "in great divisions characterized by similarity of exterior conformation," while the second, the ethnographic system, arranged groups on "analogies of language."[59] His own research interests lay with classification based on the physical, skull-measuring system, but he acknowledged that both physical and ethnographic analysis were functional proxies for differences that were difficult to measure, and that the combination of both systems would provide the most "natural and comprehensive" classificatory method. After Morton's death in 1851, his fellow polygenists Josiah Nott and George Gliddon produced their 1854 *Types of Mankind, or Ethnological Researches* as a commemorative volume, and then followed its success with another work, *Indigenous Races of the Earth*, in 1857, which collected essays by notable scholars in both Europe and the United States.[60] French philologist Alfred Maury contributed the first essay in the book: "On the Distribution and Classification of Tongues."

"Does not speech, in fact, reflect the intelligence better," asked Maury, "is not language more competent to give [intelligence's] measurement, than can be gathered from the dimensions of the facial angle, and the amplitude of the cranium?"[61] In addition to his philological and

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[59] Samuel G. Morton, *Crania Americana; or, A Comparative View of the Skulls of Various Aboriginal Nations of North and South America: To Which is Prefixed an Essay on the Varieties of the Human Species* (Philadelphia: J. Dobson, 1839), 4. Reprinted in Bernasconi, ed. *American Theories of Polygenesis* (Bristol: Thoemmes, 2002), vol. 1. On Morton, also see Stephen Jay Gould, *The Mismeasure of Man* (New York: Norton, 1981).

[60] J.C. Nott and George R. Gliddon, *Types of Mankind: or, Ethnological Researches, Based Upon the Ancient Monuments, Paintings, Sculptures, and Crania of Races, and upon their Natural, Geographical, Philological, and Biblical History* (Philadelphia: Lippincott, Grambo, & Co., 1854); and J.C. Nott and George G. Gliddon, *Indigenous Races of the Earth; or, New Chapters of Ethnological Enquiry; Including Monographs on Special Departments of Philology, Iconography, Cranioscopy, Palaeontology, Pathology, Archaeology, Comparative Geography, and Natural History* (Philadelphia: J.B. Lippincott & Co., 1857), in Bernasconi, ed. *American Theories of Polygenesis*. (Bristol: Thoemmes, 2002), vol. 3 and 4.

[61] Alfred Maury, "On the Distribution and Classification of Tongues, -- Their Relation to the Geographical Distribution of Races; and on the Inductions Which May Be Drawn from These Relations," in Nott and Gliddon, *Indigenous Races of the Earth,* 36.

ethnological work, Maury also served as both the Librarian of the French Imperial Institute and the Secretary-General of the Société de Géographie de Paris. His rhetorical question was actually a loose paraphrase of another scholar, German philologist M.A.F. Pott of the University of Halle. Maury was not entirely convinced by Pott's reasoning – he felt that physiological analysis was a better tool for hierarchical orderings, since some advanced civilizations had "a language very imperfect in its forms," while simultaneously people from a "savage tribe" might speak a language "possessing a certain grammatical richness."[62] What Maury did not contest, however, was that language could be sorted into families based on genealogical similarities, and that these similarities could be used to reconstruct the long history of the human species.

Changes in body type, skin color, stature, or skull size were difficult to track historically. The physical method of classification described by Morton, for example, was practicable synchronically, but not diachronically, at least not without access to enormous stockpiles of crania and skeletal material. A written language could be tracked historically, with permutations and derivations preserved in literary, historical, and legal traditions, but could not always be assigned to historical races, especially in the case of extinct languages.[63] (Cultures without written languages were also rendered completely invisible in this scholarly canon.) One persistent topic of debate among ethnologists in the early nineteenth century was the racial identity of the ancient Egyptians. This dispute was largely rooted in a bid to claim ancient Egyptians and their sophisticated architectural and artistic traditions as Caucasian, while denying that heritage to the contemporary Egyptian population. But it was also that the language

[62] Maury, "On the Distribution and Classification of Tongues," in Nott and Gliddon, *Indigenous Races of the Earth,* 36.
[63] In some cases, researchers suggested that the keen racial classifier turn towards cultural material, like ancient murals or sculptures, to analyze the racial identity of long-lost civilizations and cultures.

transcribed in hieroglyphics was not the same as the dialect of Arabic that current people living in Egypt used – ergo, the ancient Egyptians must have been of a different race.[64]

Analyzing philological linkages could be dry work, and studies of the similarities between roots in obscure dialects of Gothic and Turanian, or of the persistence of fish gods in six different Eurasian mythological systems, did not necessarily capture public attention. George Eliot's *Middlemarch*, although written a generation later, preserves the stereotypical philologist and mythologist in the character of Mr. Casaubon – a dry, obscure man, unable to communicate the relevance of his work to his wife, Dorothea, who suspects his project is ultimately pointless.[65] Nevertheless, philological and ethnographic analysis leaked into the public sphere. In 1844, the anonymously-authored book *Vestiges of the Natural History of Creation* appeared for sale in London book markets. *Vestiges* was a vibrant hybrid, combining genre norms from fiction, science, and philosophy, and a spectacular publishing success, selling more than ten thousand copies in its first five years in print.[66] The mystery of the identity of the author only added to the furor; it was not until the 1880s that *Vestiges* was confirmed to be the work of Scottish publisher Robert Chambers.[67] In *Vestiges*, Chambers described a cosmological narrative that began with the creation of the planets, moons, and stars in a gaseous 'Fire-mist' and concluded with the

[64] Or a different sub-branch of the Caucasian race, since in some racial classification systems (e.g. Prichard's and Cuvier's), the Arabs were a subcategory of Caucasian, usually in Syro-Aramaic branch, and some ethnologists would have preferred the term "stock" or "tribe" instead of "race" here. Also, if the ancient Egyptians were a different people from modern Egyptians, it was unproblematic to export lots of antiquities to France and Britain. On this last point, see Donald Malcolm Reid, *Whose Pharaohs? Archaeology, Museums, and Egyptian National Identity from Napoleon to World War I* (Berkeley: University of California Press, 2002).
[65] Kidd, *The World of Mr. Casaubon,*199-200.
[66] James Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2000), 526.
[67] Secord, 497.

"Early History of Mankind." It was in this last section that Chambers made the most use of the philological and ethnological work of the past half-century.

As Chambers presented the case to his readers, languages mapped onto nations, tribes, or races. If it was assumed the human species had a common starting point – Chambers believed in monogenesis –and that humans gained the ability to speak before they began to migrate, then it should be possible for scholars to trace the commonalities between languages back and find the cradle of the human species. Chambers located this cradle in northern India:

> Standing on that point, it is easy to see how the human family, originating there, might spread out in different directions, passing into varieties of aspect and of language as they spread, the Malay variety proceeding towards the Oceanic region, the Mongolians to the east and north, and sending off the red men as a sub-variety, the European population going off to the north-westward, and the Syrian, Arabian and Egyptian, towards the countries which they are known to have so long occupied.[68]

The emergence of speech, Chambers argued, had to have occurred before human groups began to migrate, because spoken language was the chief novelty in development that marked the advent of the human race.[69] Hence, tracing the origin of Indo-European, which Chambers believed to be the parent language of all subsequent dialects, would also indicate where the human species had begun.

Philologists "have thrown the earth's language into a kind of classification," Chambers wrote, and grouped languages together based on their resemblances and geographical proximity

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[68] Anonymous [Robert Chambers], *Vestiges of the Natural History of Creation*, 3rd ed. (New York: Wiley and Putnam, 1845), 205-207. The invocation of "standing on that point" is only rhetorical – Chambers never traveled to India.

[69] Chambers, 216-217. "The inferior animals possess some of those means of communicating ideas, and they have likewise a silent and unobservable mode of their own, the nature of which is a complete mystery to us, though we are assured of its reality by its effects. Now, as the inferior animals were all in being before man, there was language upon earth long ere the history of our race commenced. The only additional fact in the history of language, which was produced by our creation, was the rise of a new mode of expression – namely, that by *sound-signs* produced by the vocal organs. In other words, speech was the only novelty in this respect attending the creation of the human race."

into six overarching families. The first was the Indo-European family, which "nearly coincides in geographical limits with these which have been assigned to that variety of mankind which generally shows a fair complexion, called the Caucasian variety."[70] This family occupied the territory from India through Persia to Europe, with the exception of Hungary, Finland, and the Basque provinces of Spain, since those regions possessed languages that were clearly not Indo-European. The second family was the Syro-Phoenician, which included Hebrew, Arabic, 'Syro-Chaldaic' (Aramaic), and Ge'ez; the third, 'Africa,' with no further detail given. The remaining families were the Polynesian family, which included languages from around south and southeast Asia, as well as Australia; the Chinese family, which grouped Chinese with the languages of most of "Central and Northern Asia"; and, sixth, the indigenous languages of the Americas.[71] Still, though, Chambers believed Indo-European was the ancient parent language of all the other families, even the ones that had diverged so far as to be apparently unrelated; its history was treated as a reasonable proxy for that of the human race as a whole.

He admitted one possible exception to this overarching schema, where physical differences appeared to be so marked that it was difficult for him to understand how this group of people might be related to the other groups he had just described:

> The negro alone is here unaccounted for; and of that race it may fairly be said, that it is the one most likely to have had an independent origin, seeing that it is a type so peculiar in an inveterate black color, and so humble in development.[72]

Variations in "external form and color" were at least partly the product of the environment in which people lived: he cited cases where Arab and Jewish families settling in North Africa had become "as black as the other inhabitants," as well as facts that seemed to suggest that a skin

[70] Chambers, 197-198.
[71] Chambers, 200-202.
[72] Chambers, 205-207.

color transition could happen the other way, from darker to lighter over time.[73] But then there was the problem of identifying the history of African languages. Unless some compelling philological evidence proved that the languages of sub-Saharan African peoples were in fact obviously descended from Indo-European, Chambers was prepared to abandon his belief in the single origin of the human species and allow that people in Africa, alone of all the continents, could have come from "at least one other line or source of origination…which resulted in the production of a being identical in species, although variously marked."[74] According to what Chambers termed the development hypothesis, the "original seat of the human race" should be in a place where the quadrumana, or 'four-handed' primates, i.e. the great apes, were also found. He noted that these apes were most abundant, in terms of both population and number of species, in southeast Asia. However, the recent researches of Richard Owen on chimpanzees in West Africa suggested that instead it was the chimpanzee that "approaches nearer to man than any known species of Indian simiae." Chambers suggested that perhaps this meant chimpanzees provided plausible support for a thesis of separate African origins, while the rest of the world was settled by humans who first emerged in Asia and might be more closely related to the orangutan and gibbon.

Like many topics discussed in *Vestiges*, Chambers' claims about the origins and history of language were immediate spurs to controversy. At the 1847 meeting of the British Association for the Advancement of Science, there were no fewer than five papers about philology and

[73] Chambers, 194-95.
[74] Chambers, 207. African languages, their "primitiveness," and their relationship with other regional and world languages was a subject of fascination (and frustration) for European colonial officials, merchants, and missionaries in different parts of the African continent from the seventeenth century onwards. For a useful overview, focused on colonial language study in South Africa, see Rachael Gilmour, *Grammars of Colonialism: Representing Languages in Colonial South Africa* (New York: Palgrave Macmillan, 2006).

ethnology, responding to – and contesting – different elements of *Vestiges*.[75] Most, if not all, of these papers were reacting to very specific elements of the philological and ethnographic theory put forward in the book, particularly the sections that dealt with the emergence of language.[76] This topic would remain the third rail of linguistics and evolution for decades. The reaction to the discussion of language in *Vestiges* was heightened by the work's anonymous authorship and notoriety, but otherwise Chambers was treading fairly uncontroversial ground.

Following this history from Jones to Chambers, we can see how the concepts of language and race became interwoven with one another. Terms like "tribe," "family," and "stock" moved fluidly between philological and ethnological circles, their way eased by the fact that it was possible for one person or one set of scholars to write in both fields simultaneously, and to cross the porous boundaries of nascent disciplines without much friction – although, as the case of Chambers shows, by the 1840s this disciplinary fluidity was beginning to decline. Certainly, also, there were variations in different national communities. The political ramifications of defining identity through language and race rather than nationality were felt much more strongly by scholars like Bopp, Schlegel, and Wilhelm von Humboldt in the German principalities than by their colleagues in France, Britain, or the United States. American scholars of race and inequality were never able to escape the immediate applicability of their work to the question of slave ownership and African American humanity. British philology initially benefitted from having the easiest access to Sanskrit texts in southeast Asia, but was swamped by more 'scientific' insights from German philology and religious studies beginning in the 1830s. In France, beginning in the 1850s ethnography turned strongly towards physical analysis under the

[75] Hans Aarsleff, *The Study of Language in England, 1780-1860* (Princeton: Princeton University Press, 1967), 224-229.
[76] Aarsleff, 226.

leadership of Paul Broca. Nevertheless, the idea remained that race and language could be used together to approximate the history of different human groups. It would be left to the next generation's scholars to begin to untangle the two concepts.

The Origins of Species, Races, and Tongues:

In 1859, after more than two decades of intellectual gestation, Charles Darwin published *On the Origin of Species, Or the Preservation of Favoured Races in the Struggle for Life*. Concerned with getting his main ideas of natural selection and descent with modification into circulation, and recognizing that his arguments against the independent creation of species were already controversial enough, he strategically left human evolution out of the argument of the text. In the third-to-last paragraph of the conclusion of *Origin*, right before the famous and beautiful "entangled bank" image, Darwin wrote simply that "open fields for far more important researches" might appear in the "distant future."[77] Among these open fields, implicitly, was the application of his evolutionary theory to the problem of the emergence of humans. While Darwin was inclined to play coy with the issue of the evolution of humankind, many of his readers made the obvious connection, and, further, began to apply his conclusions in their own works.

One of the first thinkers to take Darwin's ideas in a new direction was the philologist Friedrich Max Müller. The foremost Sanskritist of his generation, Müller was a German expatriate who had come to Britain to work on translations of the *Rig Veda*, using Sanskrit documents held by the British East India Company. Although he had been appointed to a deputy professorship of modern languages at Oxford in 1850, ten years later Müller's career was temporarily at low ebb, after he had lost out against a rival candidate for the Boden Professorship

[77] Charles Darwin, *On the Origin of Species, Or the Preservation of Favoured Races in the Struggle for Life* (London: John Murray, 1859), 488.

in Sanskrit in 1860. Nonetheless, in the summer of 1861 Müller launched a celebrated series of lectures at the Royal Institution, which took up the topic of the history and origins of human language, and approached these topics from the standpoint of human evolution.[78]

In the nine-part series "Lectures on the Science of Language," given in April, May, and June 1861, Müller traced the history of his own discipline, comparative philology, for five of the nine lectures, and then explored some of its latest intellectual maneuvers, including studies of comparative grammar and speculations on the natural origins of speech.[79] He was in no way blind to the political elements of his material:

> In modern times the science of language has been called in to settle some of the most perplexing political and social questions. "Nations and languages against dynasties and treaties," this is what has remodeled, and will remodel still more, the map of Europe; and in America comparative philologists have been encouraged to prove the impossibility of a common origin of languages and races, in order to justify, by scientific arguments, the unhallowed theory of slavery.[80]

In both the American and the European examples he chose, Müller reinforced the connections between language and race; each was a distinct phenomenon, but clearly interlinked. In a later lecture, reviewing the history of the discipline, Müller explained the major tenets of the Indo-European hypothesis, although he preferred 'Aryan hypothesis', slipping easily between talking about the history of a given dialect or language group, and talking about the people who spoke those languages in the same breath:

> As sure as the six Romance dialects point to an original home of Italian shepherds on the seven hills at Rome, the Aryan languages together point to an earlier period of language,

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[78] Müller makes frequent appearances in the literature on Victorian philology: see, for example, Olender, *Languages of Paradise*; Poliakov, *Aryan Myth*; and Burrow, "The Uses of Philology in Victorian England." On Müller's exchanges with Darwinism, see Janet Browne, *Charles Darwin: The Power of Place* (Princeton: Princeton University Press, 2002), 190; and Radick, *Simian Tongue*.
[79] F. Max Müller, *Lectures on the Science of Language, Delivered at the Royal Institution of Great Britain in April, May, and June 1861* (London: Longman, Green, Longman, and Roberts, 1861).
[80] "Lecture I. The Science of Language One of the Physical Sciences," in Müller, *Lectures on the Science of Language,* 12.

> when the first ancestors of the Indians, the Persians, the Greeks, the Romans, the Slavs, the Celts, and the Germans were living together within the same enclosures, nay under the same roof.[81]

Without explicitly claiming that languages and races were one and the same, Müller's lectures habitually elided 'people who speak Greek' and 'the Greeks,' and reinforced the idea that there was once an 'Aryan race' to whom modern speakers of Indo-European tongues could trace their ancestry.

Müller's remarks on the Aryan languages-Aryan races dyad were one important contribution to mid-century ideas about human origins; the other was his remarks on the origin of human speech. Speech, claimed Müller, channeling the thought of philologist Wilhelm von Humboldt, was the ultimate dividing line between beasts and humankind.[82] Two popular proposals on the origin of language were the imitative thesis (where humans imitated natural sounds in their environment) and the instinctual exclamation thesis, where shouts or alarm cries slowly came to carry further meaning.[83] Müller, however, dismissed both:

> Language is our Rubicon, and no brute will dare to cross it. This is our matter of fact answer to those who speak of development, who think they discover the rudiments at least of all human faculties in apes, and who would fain keep open the possibility that man is only a more favored beast, the triumphant conqueror in the primeval struggle for life. Language is something more palpable than a fold of the brain, or an angle of the skull. It admits of no caviling, and no process of natural selection will ever distill significant words out of the notes of birds or the cries of beasts.[84]

Müller's lecture series occurred a few months after Paul Du Chaillu's arrival in London with several stuffed gorillas in early 1861, whereupon the very man-like apes had become a

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[81] "Lecture V. The Genealogical Classification of Languages," in Müller, *Lectures on the Science of Language,* 198.
[82] "Lecture IX. The Theoretical Stage, and the Origin of Language," in Müller, *Lectures on the Science of Language,* 331.
[83] Müller, 344-346.
[84] Müller, 340.

public spectacle. In the intervening time, there had also been a vituperative public spat between Richard Owen and Thomas Henry Huxley about the structure of human and gorilla brains, especially the structures that were believed to correspond with language. Müller and his audience would have been very aware of this conversation, and of the stakes of the question of whether human speech had animal origins, especially in light of Darwinian theory.[85] Even if speech was solely reserved to humans, and had its origins in some mysterious internally-produced or divinely-induced spiritual impulse (as Müller appeared to suggest in his final lecture), tracing the history of language back to its origin point would give scholars a means to pinpoint the formation of the human species, and, perhaps, its splintering into distinct races.

However, the casual slippage between language and race which characterized Müller's by all accounts extraordinarily popular lecture series was increasingly under pressure. In December 1862, a British ethnologist John Crawfurd read aloud a paper at a meeting of the London Ethnological Society, "On Language as a Test of the Races of Man."[86] Born in Scotland in 1783, Crawfurd trained as a physician in Edinburgh before taking a posting with the East India Company in 1806.[87] He rose rapidly within the imperial networks of southeast Asia, becoming the British Resident of Yogyakarta from 1811 until the British withdrawal from Java in 1816, and then served a second term of diplomatic service as the Resident of Singapore from 1823 to 1826. In between postings, he wrote extensive linguistic and historical surveys, including a three volume "History of the Indian Archipelago," published in 1820. Before returning to Britain

[85] Radick, 15-16.
[86] John Crawfurd, "On Language as a Test of the Races of Man," *Transactions of the Ethnological Society of London* 3 (1865), 1-9.
[87] Crawfurd's path prefigures that of both Charles Darwin, who studied for, but did not complete, a degree in medicine at Edinburgh some twenty years later, and Eugène Dubois, who took a medical position in the Netherlands East Indies in the 1880s when independent research funding for his proposed paleontological work in Sumatra and Java was not forthcoming.

permanently in the 1830s, Crawfurd amassed a significant collection of Malay manuscripts, which provided the basis for his magisterial dictionary and grammar of the Malay language, completed in 1852.[88] After several failed attempts to run for parliament, Crawfurd turned full time to his philological and ethnographic pursuits, and took over the presidency of the London Ethnological Society in 1861, at the age of seventy-eight. Crawfurd's liberal and abolitionist politics were largely in line with those of the organization, although he was also a famously staunch polygenist.[89]

> In his 1862 paper, Crawfurd clearly laid out his central thesis:
>
> I do not hesitate at once to affirm that language, although yielding valuable evidence of the history and migrations of man, affords no sure test of the Race he belongs to. The proofs of this are, in my opinion, abundant, and I select a few of them in illustration.[90]

The majority of inhabitants of the British Isles, who were not, by Crawfurd's account, representatives of a Germanic race, spoke a language derived from German; the handful of lingering languages that were indigenous to the islands, Celtic languages like Welsh and Cornish, were on the verge of being wiped out, "without doubt, doomed in a few generations to extinction as living languages."[91] The enslaved African populations of North and South America

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[88] Annabel Teh Gallop, "John Crawfurd and Malay Studies," *Asian and African Studies Blog*, 27 May 2014. http://blogs.bl.uk/asian-and-african/2014/05/john-crawfurd-and-malay-studies.html Accessed online May 9, 2017; see also Annabel Teh Gallop, "Reading Malay manuscripts with children," *Asian and African Studies Blog*, 12 December 2013, http://britishlibrary.typepad.co.uk/asian-and-african/2013/12/reading-malay-manuscripts-with-children.html for further information on Crawfurd's reading habits.

[89] See George W. Stocking, Jr., *Victorian Anthropology* (New York: The Free Press, 1987), 250-252.

[90] Crawfurd, "On Language as a Test," 1.

[91] Crawfurd, "On Language as a Test," 1. Crawfurd's examples from Britain bear closer examination. By the time he was writing, Cornish was already a dead language, the last native speaker having died in 1777. Welsh, however, continues to thrive in the twenty-first century. On recent attempts to revive Cornish as a written and spoken language, see Dave Sayers, "Standardizing Cornish: The Politics of a New Minority Language," *Language Problems and Language Planning* 36, no. 2 (2012), 99-119. The idea of "indigeneity" here is pretty vacuous, since the Celts must have also migrated into the islands at one point.

no longer communicated in their own languages, but instead spoke Germanic and Romance languages. Even though the philological evidence linking Sanskrit and European languages together was compelling, Crawfurd argued there was no evidence whatsoever that either light-skinned, fair-haired European-looking peoples had ever been spotted in India (historically – obviously, numbers had somewhat gone up following successive British colonial invasions), nor could people with dark hair or brown skin common to the subcontinent be attested to in the long history of Europe, and since, as Crawfurd explained, "neither time, climate nor locality will produce any material alteration of race," the purported synonymy between race and language was nothing more than an "ethnological figment."[92]

Furthermore, Crawfurd hit on a central problem with the extended Indo-European hypothesis: it was compelling as an origin story for all human languages provided one only paid attention to the Indian and European languages. Where did major, and unrelated, Asian languages like Chinese and Japanese come from? How could the Indo-Europeanists explain the New World languages? What about Malay-derived languages in southeast Asia, which were clearly all related to each other, and spoken by people who could not always plausibly be grouped in one race?

The next year, in 1863, both Charles Lyell and Thomas Henry Huxley authored works defending Darwinism and explicitly engaging with human evolution. The first was Charles Lyell's *The Geological Evidences of the Antiquity of Man with Remarks on Theories of the Origin of Species by Variation.*[93] Lyell reviewed recent discoveries in prehistoric archaeology. For the previous few decades, Europeans had been finding human bones or what appeared to be

[92] Crawfurd, "On Language as a Test of the Races of Man," 2.
[93] Charles Lyell, *The Geological Evidences of the Antiquity of Man with Remarks on Theories of the Origin of Species by Variation* (London: John Murray, 1863).

worked tools in caves, embedded in breccia or stalactites, or in conjunction with the bones of obviously extinct animals. Excavations of Danish peat bogs had yielded stone, iron, and bronze implements, as well as piles of discarded oyster shells in what appeared to be a prehistoric kitchen midden – it could not be recent, since modern oysters were not found anywhere in the region. After nineteen chapters on prehistoric monuments, cave excavations, Neanderthal skulls, and patterns of glaciation, Lyell finally turned to the topic "Theories of Progression and Transmutation." With the expanded timescale made possible by the enumerated evidence of human antiquity, Lyell felt the objections raised by the polygenists fell away; there was more than ample time for racial differentiation to take place:

> So long as physiologists continued to believe that man had not existed on the earth above six thousand years, they might, with good reason, withhold their assent from the doctrine of a unity of origin of so any distinct races…but the difficulty becomes less and less, exactly in proportion as we enlarge our ideas of the lapse of time during which different communities may have spread slowly, and become isolated, each exposed for ages to a peculiar set of conditions, whether or temperature, or food, or danger, or ways of living.[94]

Following two further chapters where Lyell engaged in a rather equivocal defense of Darwin's theories (at least to Darwin's mind), he turned to the question of language.[95]

Drawing liberally on Müller's lecture series, as well as on Crawfurd's article of 1862 objecting to some of the claims in the same, Lyell described how the study of language could cast light on the origins and prehistory of humans. There was, certainly, the possibility that the Aryan language could be traced back to some primordial home, and Lyell tried to finesse some of Crawfurd's objections by positing that the Aryan invaders could have conquered other populations, imposing their language and in the meantime intermarrying with their subjects, resulting in a swamping of distinct Aryan racial characteristics, whatever they may have been,

[94] Lyell, 386.
[95] On Darwin's reaction to Lyell's book, see Browne, *Power of Place,* 219.

but preserving aspects of the language.[96] He also turned towards a more metaphorical comparison between the evolution of languages and the evolution of species. Slight alterations of accent, orthography, or idiomatic expression could be observed within one person's lifetime; perhaps it could be assumed that some sort of disinterested 'selection' practice was in effect.[97] Like species, "If all known languages are derivative and not primordial creations, they must each of them have been slowly elaborated in a single geographical area. No one of them can have had two birthplaces."[98] Similarly, languages could be vulnerable to either slow or swift extinctions. Still, when he came close to positing a homeland for the first emergence of the human species, Lyell stayed away from the language thesis altogether. The lack of evidence of a transitional form between apes and humankind was easy to explain, "since we have not yet searched those pages of the great book of nature, in which alone we have any right to expect to find records of the missing links alluded to."[99] The key was to go to the countries which were the present day homes of the anthropomorphous apes: "the tropical regions of Africa, and the islands of Borneo and Sumatra, lands which may be said to be quite unknown in reference to their Pliocene and post-Pliocene mammalia."[100]

Lyell was writing about the earliest days of the human species, and so concerned himself with matters of cultural production, stone artifacts, and languages. Huxley, on the other hand, looked at human evolutionary relations running backwards in time and down the *scala naturae*. In his *Evidence as to Man's Place in Nature*, Huxley covered the natural history of the "man-like apes," and compared the physical organization of humans to the other ape species, noting

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[96] Lyell, 455-456.
[97] Lyell, 462. A relevant modern example of Lyell's principle at work can be seen in the movie *Mean Girls*: "Gretchen, stop trying to make 'fetch' happen!"
[98] Lyell, 465.
[99] Lyell, 498. This is the first recorded instance of the phrase 'missing link.'
[100] Lyell, 498.

structural similarities in skulls, teeth, hands and feet, and also brains between the two groups.[101] *Man's Place in Nature* was also the first instance of the now famous "ascent of Man" sketch, showing five skeletons (gibbon, orangutan, chimpanzee, gorilla, human), with humans at the end of the line and standing upright.[102] Despite all the prehistoric discoveries that his friend Lyell had discussed at length in his own book, Huxley noted that modern research did not seem to be getting appreciably closer to discovering evidence of a transitional form that did not appear to already be more or less human. "Where, then," he wrote, "must we look for primaeval Man? Was the oldest *Homo sapiens* Pliocene or Miocene, or yet more ancient? In still older strata do the fossilized bones of an Ape more anthropoid, or a Man more pithecoid, than any yet known await the researches of some unborn palaeontologist?" Huxley made no geographical pronouncements, only saying: "Time will show."[103]

Both Lyell and Huxley's books were reviewed by Crawfurd in the *Transactions of the Ethnological Society of London*, and the review essay itself read at a meeting of the Society on April 14, 1863.[104] In general, Crawfurd found himself in agreement with Huxley, although he admitted that primate physiology and comparative anatomy was not one of his special areas of expertise. He objected to Huxley's emphasis on the physical similarity between ape and human brains, given that there were such obvious differences between the qualities that said brains apparently had. "The sheep and goat have brains not distinguishable," wrote Crawfurd, by way

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[101] Thomas Henry Huxley, *Evidence as to Man's Place in Nature* (London: William and Norgate, 1863). Like Müller's 1861 book, Huxley's essays had originally seen light as a series of "six Lectures to Working Men" in 1860, and a further two, "to the members of the Philosophical Institution of Edinburgh" in 1862. For further discussion, see ch 17, "Man's Place," in Adrian Desmond, *Huxley: From Devil's Discipline to Evolution's High Priest*, 1st US ed. (Reading, MA: Addison-Wesley, 1997).
[102] Browne, *Power of Place*, 221.
[103] Huxley, 159.
[104] John Crawfurd, "On Sir Charles Lyell's 'Antiquity of Man', and on Professor Huxley's 'Evidence as to Man's Place in Nature,'" *Transactions of the Ethnological Society of London* 3 (1865), 58-70.

of illustration, "yet the goat is a very clever animal, and the sheep a very stupid one."[105] However, he took Lyell to task, particularly for his invocation of Müller's Aryan hypothesis:

> According to the theory, the human skeletons found in the caverns near Liège must have belonged to the nomadic wanderers from Central Asia, or their descendants; and so the era of the imaginary migration carries us back to a time when man was a contemporary of the extinct mammoth, the cave lion, and rhinoceros.[106]

He had further difficulties bending his head around Lyell's metaphor that species, races, and languages could be said to evolve according to the same mechanisms, just at different rates of change, since Crawfurd was a staunch believer in the immutability of races. But this was less important, apparently, than convincing Lyell that the Aryan hypothesis, in the way that it linked together language and race, was intellectually bankrupt.

Huxley probably agreed with Crawfurd, his friendship with Lyell notwithstanding. In 1864, he was working on another series of lectures for working men on the subject 'The Races of Mankind.'[107] The first five dealt with different racial groups, while the last lecture was simply titled "Problems." In Huxley's scribbled notes, the final heading of the "Problems" lecture began "Consider language evidence," and a further line below questioned "value without physical characters." Another lecture, published in 1865 in *The Fortnightly Review*, was titled "On the Methods and Results of Ethnology," and marked Huxley's strongest riposte against the conflation of language and race.[108] "Without the least desire to depreciate the value of philology as an adjuvant to ethnology," began Huxley:

> …it seems obvious to me that, though…unity of languages may afford a certain presumption in favor of the unity of stock of the peoples speaking those languages, it

[105] Crawfurd, "On Lyell's 'Antiquity of Man,'" 67.
[106] Crawfurd, "On Lyell's 'Antiquity of Man,'" 62.
[107] Huxley papers, vol. 102. Ethnology Notebook, p. 13. Imperial College Archives, London.
[108] Essay republished in Thomas H. Huxley, *Man's Place in Nature, and Other Anthropological Essays* (New York: D. Appleton and Company, 1898), 209-252. The original lecture notes are preserved in Huxley's papers, Vol. 103 Ethnology Notebook, Imperial College Archives.

> cannot be held to prove that unity of stock, unless philologers are prepared to demonstrate, that no nation can lose its language and acquire that of a distinct nation, without a change of blood corresponding with the change of language.[109]

Huxley's other aim in this lecture was to cut through the static that continued to build in the continuing monogenist-polygenist dispute. The answer to the problem, he wrote, was Darwinism: this discredited both the radical polygenists, on the one hand, and, on the other, the "Adamites," who believed in the recent special creation of humankind, and the "Rational Monogenists," who believed, firstly, "that the present condition of the earth has existed for untold ages; secondly, that, at a remote period, beyond the ken of Archbishop Usher, man was created, somewhere between the Caucasus and the Hindookoosh."[110] The first point was unproblematic; as to the second, Huxley wrote: "…even if special creation [of mankind] may be granted, there is not a shadow of a reason why he should have been created in Asia rather than anywhere else."[111] Absence of evidence was not the same as evidence in favor of another view; but Huxley was inclined to be skeptical of enthusiastic but poorly-sourced Asian hypotheses of human origins. Identifying the locus of origin of (some) languages did not necessarily mean that the locus of human evolution had been identified.

In 1863, the German philologist August Schleicher published *Die Darwinsche Theorie und die Sprachwissenschaft*, an open letter to his friend Ernst Haeckel thanking the latter for gifting him a German translation of *Origin of Species*.[112] Schleicher had assumed Haeckel had

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[109] Huxley, *Man's Place in Nature* (1898), 215.
[110] Huxley, *Man's Place in Nature* (1898), 242-244.
[111] Huxley, *Man's Place in Nature* (1898), 244.
[112] August Schleicher, *Die Darwinsche Theorie und die Sprachwissenschaft. Offenes Sendschreiben an Herrn Dr. Ernst Häckel, o. Professor der Zoologie und Director des zoologischen Museums an der Universität Jena* (Weimar: Hermann Böhlau, 1863). A second German edition was published, also in Weimar, in 1873. The first English translation appeared in 1869, and was published in London as August Schleicher*, Darwinism Tested by the Science of Language*, trans. Alex V.W. Bikkers (London: John Camden Hotten, 1869). While I've consulted both the English and German editions, all English citations are to the 1869 translation by Bikkers.

given him Darwin's book because Schleicher had a hobbyist interest in both botany and gardening. Instead, though, he found that his imagination was caught by the many ways that evolutionary ideas were useful for conceptualizing genealogical relationships among languages over time, and for understanding how these linguistic shifts might happen. Where the biologist would identify genera, species, and 'race,' in descending order of specificity, Schleicher noted these categories mapped smoothly onto ones useful to a scientist of language: genus became 'language family,' species were equivalent to languages, and dialects could be thought of as linguistic 'races'.[113] "Darwin's views and theory struck me in a much higher degree," wrote Schleicher to Haeckel, "when I applied them to the science of language."[114] In fact, Schleicher argued, it was much easier to see Darwinian processes like descent with modification and natural selection in the study of language: the invention of writing made the historical development of languages visible and tractable. It was impossible that the imperfect, incomplete fossil record of biological evolution could be read in the same way. In fact, Schleicher came away more convinced of the rightness of Darwin's ideas because he could see how the concepts were generally applicable in the study of language.

In 1869, Schleicher's *Die Darwinsche Theorie und die Sprachwissenschaft* was translated into English by Alex V.W. Bikkers, and published in Britain, where it was promptly reviewed in *Nature* by Max Müller.[115] Müller couldn't resist pointing out that the modified English title, *Darwinism Tested By the Science of Language*, was a little inappropriate—a more direct translation of the German title would be "Darwinian Theory and the Science of Language," which, admittedly, is much less catchy—and commented, "Professor Schleicher could hardly

[113] Schleicher, *Darwinism Tested by the Science of Language*, 32-33.
[114] Schleicher, *Darwinism Tested by the Science of Language*, 15.
[115] F. Max Müller, "The Science of Language," *Nature* 1, no. 10 (January 6, 1870), 256-259.

have thought that the truth or falsehood of Mr. Darwin's theories depended on any test that can be applied to them by the Science of Language."[116] In Bikkers' translation, this "scientist of language" is technically referred to as a "glossologist," which Bikkers admitted was a "Jena-ism" brought into English for the first time.[117] In the German edition, Schleicher made a distinction between "die Glottik, die Wissenschaft der Sprache," as a natural science like biology that should use the same methods, and "die Philologie, einer historischen Disciplin."[118] Bikkers deployed "glossology" to make it clear that he was speaking about a field of study distinct from both linguistics and philology.

In his 1870 review of the English translation of Schleicher, Müller made it clear that the question of whether the 'science of language' should be considered a 'natural science' was, first, a live topic of debate in language-science circles, second, becoming deeply boring to him, and, third, that many researchers on the pro "philology-as-natural-science" side were taking the applicability of Darwinian ideas to language to be evidence that languages were 'natural organisms,' and should be studied accordingly (probably with a commensurate increase in prestige or access to different funding and promotion lines within the German university system). This adds another category to the nuancing of Darwin's post-*Origin*, pre-*Descent* philological fan club: language scholars who wanted to be taken seriously as a part of the natural sciences, who tried using the idea that biological concepts were pertinent to their studies to bolster their claims.[119]

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[116] Müller, "Science of Language," 257.
[117] Schleicher*, Darwinism Tested by the Science of Language*, 18, footnote.
[118] Schleicher, *Die Darwinsche Theorie,* 7.
[119] On Germany philology and disciplinarity, see chapter by Constanze Güthenke, "'Enthusiasm Dwells Only in Specialization': Classical Philology and Disciplinarity in Nineteenth-Century Germany," in Sheldon Pollock, Benjamin A. Elman, and Ku-ming Kevin Chang, eds., *World Philology* (Cambridge: Harvard University Press, 2015), 264-284.

There were striking similarities between the historical processes of species evolution and the insights that philologists like Müller and Schleicher had gained from studying the genealogy of the Indo-European languages. Müller personally felt the analogy of natural selection was more powerful when it was applied to explaining intra-language 'competition' phenomena – like the persistence and transformation of words and grammatical forms – than in the case of inter-language competition, such as the subsuming of regional dialects into standardized national tongues. But, none the less, both descent with modification and natural selection offered powerful analytic tools for philologists who wanted to think about the mechanisms of language change. However, this was only one of three ways that Darwinism intersected with the study of language. The question of both the natural origins of language and the relationship between languages and races had long been subjects of scholarly inquiry; the introduction of Darwinian evolution changed how these problems were formulated. *Origin* offered a persuasive new way to understand the origin of humanity, along with the origins of every other species on earth, but this understanding was still an act of interpretation, and scholars like Müller, Lyell, Huxley, and Schleicher drew on the concepts of race, language, and origins that were already at hand. Darwinian evolution was a turning point for thinking about human origins, but this turn took place in an already crowded conceptual environment.

Humankind from **Origins** ***to*** **Descent:**

In the introduction to the first edition of his 'Man-book,' published in 1871, Charles Darwin began by admitting:

> During many years I collected notes on the origin or descent of man, without any intention of publishing on the subject, but rather with the determination not to publish, as I thought that I should thus only add to the prejudices against my views.[120]

As he wrote in 1871, at the time it had seemed sufficient to indicate that, eventually, "Light will be thrown on the origin of man and his history," given that the general conclusions of *Origin* made it clear that human beings should also be "included with other organic beings in any general conclusion respecting [humankind's] manner of appearance on this earth."[121]

The Descent of Man and Selection in Relation to Sex was written in two years, although it was obviously the outcome of Darwin's lifetime of work, not just on natural selection, but also on domestication and species variation, the expression of emotion, and the varieties of animal and human behavior, including reproduction and sexual selection.[122] *Descent* was about explaining and establishing naturally occurring animal origins for characteristics that were usually treated as evidence of an impenetrable barrier between animals and humans. These included higher reason, creative or aesthetic sense, moral or religious feeling, and spoken language. "The sole object of this work," Darwin wrote in the first edition's introduction, "is to consider, firstly, whether man, like every other species, is descended from some pre-existing form; secondly, the manner of his development; and thirdly, the value of the differences between the so-called races of man."[123]

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[120] Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, vol. 1 (London: John Murray, 1871), 1. [Biodiversity Heritage Library – Naturalis Biodiversity Center copy.] Unless otherwise stated, all references are from volume 1. On the description of *Descent* as the "Man-book," see Browne, *The Power of Place*, 307.
[121] Darwin, *Descent*, 1.
[122] Browne, *Power of Place*, 325. On mate choice and sexual selection in *Descent*, see Erika Lorraine Milam, *Looking for a Few Good Males: Female Choice in Evolutionary Biology* (Baltimore: Johns Hopkins University Press, 2010), ch 1; and Evelleen Richards, *Darwin and the Making of Sexual Selection* (Chicago: University of Chicago Press, 2017).
[123] Darwin, *Descent*, 2-3.

In a book that ran to almost 900 pages of printed text, published in two volumes, the topic "On the Birthplace and Antiquity of Man" ran to barely three pages.[124] As a point of comparison, sexual selection in fish, covered in the first chapter of volume two, took twenty-nine pages of discussion and examples. But when it came to making a definitive claim on the origins and evolution of humans, Darwin appears to have had little to say.[125] From a study of bone structure and especially patterns of dentition, it was clear that humans belonged to the Old World and not the New World primates.[126] As a site for the cradle of the species, the Americas were clearly not plausible. Neither was Australia, "nor any oceanic island, as we may infer from the laws of geographical distribution."[127] The remaining candidates, then, were Europe, Asia, and Africa:

> In each great region of the world the living mammals are closely related to the extinct species of the same region. It is therefore probable that Africa was formerly inhabited by extinct apes closely allied to the gorilla and chimpanzee; and as these two species are now man's nearest allies, it is somewhat more probable that our early progenitors lived on the African continent than elsewhere.[128]

However, Darwin continued, "it is useless to speculate on this subject," since in 1856 an almost human-sized fossil ape had been discovered in southern France by paleontologist Edouard Lartet, who named the creature Dryopithecus. The find suggested that not only had anthropoid apes existed in Europe, at least during the Miocene period, but also that the tropical climate zones probably stretched into higher latitudes. Changing global climates and the vast spans of geologic time meant that it was easy for Darwin to imagine "migration on the largest scale" shifting around the geographical distribution of modern humans and modern apes, as well as their ancient shared ancestors, and sending the modern species far from their ancestral homes.

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[124] Specifically, pages 199 through 201 in volume 1.
[125] Browne, *Power of Place*, 343.
[126] Darwin, *Descent*, 196.
[127] Darwin, *Descent*, 199.
[128] Darwin, *Descent*, 199.

Even in the 'Man-book,' human evolution was neither Darwin's forte nor his chief interest. For the second edition, published in 1882, he asked his friend Huxley to contribute a supplemental essay on human evolution, appended to the end of volume one, which discussed the differences between the brains of humans and the brains of the great apes. Although the second edition was described as "revised and expanded," the discussion of the cradle of the human race was virtually the same, with only minor tweaks to the phrasing.[129]

Darwin's perspective reflects in part his intellectual alignment, as well as his unique position within nineteenth century English society. He was always more interested in issues of zoology and anatomy than ethnology, and he approached the problem of human origins accordingly. Appropriately enough, given the work's title, *Descent* was concerned with the genealogical relationship between the last common ape-human ancestor, and not with the ethnological "ascent" of humanity out of a man-ape proto-human state into a progressive fully-human future. His points of contact with Indo-European studies, comparative mythology, or even the study of Classical antiquity were limited – Darwin was the son of wealthy English country gentry, whose first professional direction had been to study (unsuccessfully) for medicine rather than the ministry.[130] He was famously lazy about studying classics as a boy, strongly preferring natural history collecting to learning Virgil or Homer by heart.[131] As an adult, his interest in matters philological seemed to consist mostly of occasional conversations with his cousin

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[129] Charles Darwin, *The Descent of Man and Selection in Relation to Sex*, 2nd edition, revised and expanded, vol. 1 (London: John Murray, 1882), 155-156.
[130] See Janet Browne, *Charles Darwin: Voyaging* (Princeton: Princeton University Press, 1996).
[131] Charles Darwin, *The Autobiography of Charles Darwin, 1809-1882*, Nora Barlow, ed. (New York: Harcourt, Brace, and Company, 1959), 27-28. To put the mismatch between Darwin's interests and the expectations of his education in context, compare his self-avowed laziness to the description of early nineteenth-century English education for upper-class boys in Anthony Grafton, "Humanist Philologies: Texts, Antiquities, and Their Scholarly Transformations in the Early Modern West," in Pollock, Elman, and Chang, *World Philology*, 154-155.

Hensleigh Wedgwood. Certainly, Darwin never attacked the science of language with the degree of verve and relentless enthusiasm that he brought to his intensive study of other topics, like barnacles or how to breed fancy varieties of pigeons.

When language was discussed in *Descent*, Darwin was concerned with the problem of the animal origins of language, and whether it was possible for speech to cross the animal-human boundary.[132] Only humans were capable of conveying a broader range of distinctive phonemes and connecting those phonemes to abstract ideas, but Darwin "could not doubt that language owes its origin to the imitation and modification, aided by signs and gestures, of various natural sounds, the voices of other animals, and man's own instinctive cries."[133] Evidence from Darwin's library shows that he owned a copy of the 1869 English translation of Schleicher's *Darwinism Tested by the Science of Language*, but he only annotated one page: on page fifty-four, Darwin underscored Schleicher's argument for the origins of human language in sound imitation and gesticulation. On the book's flyleaf he scribbled a reminder to himself "Languages primevally invented difficulty, p. 54."[134]

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[132] On Darwin and the animal origins of language, see Radick, *Simian Tongue*.

[133] Darwin, *Descent*, 56.

[134] Schleicher, *Darwinism Tested by the Science of Language*. Charles Darwin's Library digital collection, Biodiversity Heritage Library. From the bibliography of the 1480 books in the surviving collection, it appears that Darwin did not own a copy of Schleicher's original German pamphlet from 1863. Darwin *could* read German, although apparently not with any ease or pleasure; Ernst Haeckel's work proved to be a particular challenge. (See Browne, *Power of Place*, 270). This is also not to say that Darwin was completely unaware of the metaphorical applications of his theories: in *Descent*, he cited Schleicher and Müller, as well as a short article responding to Müller's review of Schleicher written by F.W. Farrar and a section from Lyell's 1863 defense of Darwinism that also remarked on the parallels between language change and species change. (See Darwin, *Descent*, 56, footnotes on pages 59 and 60). But when addressing language in *Descent*, Darwin's focus was much more on the proofs for the origin of speech in the natural world, and the imitative and cognitive processes that could make animal language, and thus eventual human language, possible. This was a different argument from the one that had been running between Schleicher and Müller, and their contemporaries on whether philology could be considered a natural science, and was also separate from the additional philologists' dispute on how to best apply Darwinian analogies to observed changes in language over time.

For Darwin, spoken language was only one of several critical developments that he needed to demonstrate had their roots in the behavior of non-human animals. Language was not the *sine qua non* of human-ness for Darwin the way that it became for Haeckel, who conceptualized the "speechless ape-man" as the key precursor stage to the evolution of humans. When writing about the processes that could produce racial variation—something he ascribed to mate choice—Darwin dismissed the conclusions of some philologists that the diversity of grammatical forms between existing modern languages meant that humans must have diffused into separate groups before attaining speech, which, if one took the position that to speak was *to be* human, amounted to a sort of soft polygenism that irritated Darwin as much as the stronger varieties. "In a series of forms graduating insensibly from some ape-like creature to man as he now exists, it would be impossible to fix on any definite point when the term 'man' ought to be used," wrote Darwin, concluding: "But this is a matter of very little importance."[135]

Even when pleading ill health from Down House, Darwin was connected to the major currents of the scientific world through his extensive network of friends and correspondents.[136] A corollary of this networked model is that it gave Darwin a certain amount of control over what he chose to engage with. His closest friends and mentors, men like Charles Lyell and Thomas Henry Huxley, were also less likely to be interested in Indo-European studies; Huxley didn't need to also be informed about the latest disputes in Biblical archaeology or orientalist scholarship to pick fights with prominent members of the Anglican clergy. Alfred Russel Wallace, lower on the social ladder and chronically in need of research and salary money, had

[135] Darwin, *Descent*, 234-235. On Darwin's disdain for polygenism, see the following line from the same page: "Finally, we may conclude that when the principles of evolution are generally accepted, as they surely will be before long, the dispute between the monogenists and the polygenists will die a silent and unobserved death."
[136] See both Browne, *Voyaging*, and Browne, *Power of Place*.

less luxury of choice in terms of his engagement with other threads of Victorian scientific society, both at home and abroad. Given his intellectual interests, social background, and positioning within the international scientific community, we can see how Darwin, who, again, appears not to have been particularly interested in the question of the exact origins of the human race in the first place, was in a position where he could arrive at a very different conclusion from many of his peers—even a peer like Ernst Haeckel, whose book Darwin praised in the introduction to *Descent*, saying that he would have almost certainly never completed *On the Origin of Species* if Haeckel's *Natürliche Schöpfungsgeschichte*, published in 1868, had appeared first.[137]

Further supporting his statement that speculation was useless, Darwin did not waste any words repudiating the Asia-centric hypothesis. In this regard, he was also breaking with the norms of many other authors asking the same question, because many Asia-centric explanations also contained implicit or explicit justifications for why Europe and Africa were *not* plausible locations. The most common argument against Europe was that it was too cold. Both the current climate and the evidence of glaciers that had formerly covered much of the continent supported this conclusion; as Charles Lyell wrote in 1863, evidence of glaciers was the key to understanding human chronology, since they seemed to "interpose an abrupt barrier to all attempts to trace farther back into the past the signs of the existence of man upon the earth" in the northern hemisphere.[138] Nonetheless, glacial activity was not consistent across the entire European continent, and there was no reason to assume that areas of Eurasia, especially parts of the landmass that were especially warm or dry in the present, despite their high latitudes, had

[137] Darwin, *Descent*, 3-4. This was probably a courteous gesture on Darwin's part, since he had been working on sexual selection as early as *Origin*. See discussion in Richards, *Darwin and the Making of Sexual Selection*, 355-363, 518-519.
[138] Lyell, *Geological Evidences of the Antiquity of Man,* 2-3.

also been covered by glaciers during key periods in the likely emergence of the human species from the anthropoid apes.

Dismissals of Africa were both implicit and explicit; it was taken for granted by many authors across the nineteenth century (and well into the twentieth) that the modern human populations of Africa had entered the continent from the north, and that, likewise, any developments in language or monumental architecture or other forms of culture had been imported from outside the continent itself.[139] In many nineteenth-century writings on the possible cradle of the human species, there is reference (explicit or not) to the long tradition of European thought on the Hamitic hypothesis, justifying the enslavement of black Africans, and to other theories of the 'torrid zone,' inhabited by strange peoples whose humanity was neither guaranteed or assured.[140] By the mid- to late-nineteenth century, the Hamitic hypothesis was undergoing a strange metamorphosis from being about the cursing of Ham and justifications for the enslavement of black Africans to being the story of a lost white tribe hidden somewhere in the mountains of East Africa.[141] Darwin, who came from not one but two families of famous proponents of the abolition of the slave trade, seems to have again approached the problem of

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[139] In 1929, Gertrude Caton Thompson presented a controversial paper at the British Association meeting on her excavations at the Great Zimbabwe site, arguing that the builders were probably the ancestors of the modern Bantu peoples, given similarities in building practices and vernacular architectural styles. The dominant theory at that time, advanced by German ethnologist and archaeologist Leo Frobenius, postulated that the Great Zimbabwe could not be an autochthonous cultural product of an advanced sub-Saharan African civilization, but instead had to have come from the north, originating in a *Kulturkreis* centered on the Middle East, Egypt, and Greece. See Gertrude Caton Thompson, *Mixed Memoirs* (Gateshead: The Paradigm Press, 1983), 130-36.

[140] On the Hamitic hypothesis, see David M. Goldenberg, *The Curse of Ham: Race and Slavery in Early Judaism, Christianity, and Islam* (Princeton: Princeton University Press, 2003), especially ch 12. See also Kidd, *Forging of Races.* On theories of the torrid zone, see discussion in Nicolás Wey Gómez, *The Tropics of Empire: Why Columbus Sailed South to the Indies* (Cambridge: The MIT Press, 2008). Lastly, on European conceptions of the origin of blackness and judgments on the humanity of African peoples during the Enlightenment, see Curran, *Anatomy of Blackness*.

[141] This extremely strange swap, which moved the Hamitic hypothesis from the realm of the book of Genesis into that of the adventure stories of H. Rider Haggard, is described with verve in Robinson, *Lost White Tribe.*

Africa versus Asia from a different perspective than many of his scientific peers, even his mentor and colleague Charles Lyell.[142]

Darwin was ultimately one of the only naturalists who conceptualized Africa as a valid alternative to Asia. His intellectual and social background explains in part why he could entertain an alternative view, but he was also asking a fundamentally new question when he sought to understand human origins. Evolutionists generally agreed that human evolution had followed the path from "Apes" to "Man-Apes" to "Man." The philologists, and many naturalists, focused on the transition from Man-Apes to Man. They approached the question by observing the many physical varieties and cultural practices of modern humans, and extrapolating backwards in time to arrive at the characteristics of the pre-racial ur-humans, with language capacity designated as the dividing line between Man and their predecessor Man-Apes. Darwin, however, came at human evolution focusing on the relationship between Apes and Man-Apes. He used anatomical knowledge of modern apes to extrapolate the physical features of the transitional ancestral Man-Ape, reading the chimpanzee and gorilla back in evolutionary time. Darwin was considering evolutionary relationships and anatomy in much the same way he had considered evolutionary relationships and language. When he turned to "the birthplace of Man," he was trying to bridge the animal-human boundary, not explain what had happened next. In fact, the emergence of racial variation that appeared to make up the core of "what happened next" in human evolutionary history was explained by the other major idea Darwin advanced in the same book – sexual selection.[143]

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[142] Adrian Desmond and James Moore in fact argue that Darwin's anti-slavery and pro-brotherhood of humankind attitudes form the moral anchor for all his future work, especially *Origin*. See Desmond and Moore, *Darwin's Sacred Cause*.

[143] You can even see this division of the problem in the title: *The Descent of Man* [from a common ancestor of both modern men and modern apes] *and* [racial variation in humans, post-emergence of the species, via] *Selection in Relation to Sex*.

Sexual selection should be understood as the final piece of the "Darwin and Africa" puzzle. One major strength, or at least source of intellectual longevity, of the Asian origins hypothesis was that it fit so neatly with received concepts of racial divergence. Enormous work was put into making the Asian origins hypothesis explain the existence of the human races. But for Darwin, sexual selection would do all the conceptual heavy lifting on the vexed problem of the emergence of racial types.[144] Darwin's placement of the birthplace of man could rest solely on the evidence of anatomical similarities with other species; he was freed of the burden of geographically determining the origin of races and explaining the entire course of human history.

If extinct species had occupied the same region as their living descendants, then Africa was the best candidate continent, because it contained both modern humans and their most anatomically similar modern ape relatives. However, as Darwin noted, given what was known about prehistoric variations in the global climate, and in lieu of actual fossil finds, his African hypothesis in *Descent* could be "only slightly more probable" than competing claims.

***Applied Darwinism*:**

Describing the critical and scholarly reception of Darwin's *Descent of Man*, Janet Browne wrote: "Few among these [reviewers] countenanced descent from animals. Yet the authors were exceedingly polite about Darwin himself."[145] Even readers who *did* countenance the possibility of descent with modification did not necessarily accept Darwin's argument for where to find the ancestral homeland of the human species – even readers who agreed that similarities in anatomy and biomechanics made the great apes the proper focal point for thinking about human evolution.

[144] See Milam, 17, and Richards, *Darwin and the Making of Sexual Selection*, 332-338.
[145] Browne, *Power of Place*, 351.

Several years after his erstwhile rival's death, Alfred Russel Wallace published *Darwinism: An Exposition of the Theory of Natural Selection*.[146] In the final chapter, "Darwinism Applied to Man," Wallace considered the problem of the relationship between humans and other apes. He argued that while Darwin (and others) had claimed humans had to originate in the tropics, where mild climates and abundant natural food sources would supposedly ease the transition from ape to human, one of the distinguishing characteristics of humans was their "special adaptation to terrestrial locomotion," – an unlikely adaptation for a species to develop in a heavily forested tropical jungle.[147] It seemed much more likely that humans *qua* humans had evolved on the open plains or high plateaus, in a temperate or at most sub-tropical zone, "where the seeds of indigenous cereals and numerous herbivora, rodents, and game-birds, with fishes and molluscs in the lakes, rivers, and seas supplied him with an abundance of varied food."[148]

The location of this food-rich temperate plain could be logically derived. The anthropoid apes were exclusively found in the eastern hemisphere, which excluded the Americas and Australia from consideration. Africa, Wallace wrote, was "known to have been separated from the northern continent in early tertiary times," only to reconnect with the Eurasian landmass at a much later period, when humans could be assumed to have already evolved. Africa, therefore, was a cul-de-sac continent, isolated and odd, and only a stage for the human story once the first act had already finished. This left only Eurasia, "and its enormous plateaus, extending from Persia right across Tibet and Siberia to Manchuria, afford an area, some part or other of which probably offered suitable conditions, in the late Miocene or early Pliocene times, for the

[146] Alfred Russel Wallace, *Darwinism: An Exposition of the Theory of Natural Selection, With Some of its Applications* (London: Macmillan and Co., 1889).
[147] Wallace, 458.
[148] Wallace, 458.

development of ancestral man."[149] Central Asia was varied enough in geography and weather conditions that the landscape would provide sufficient challenge to push humans to evolve both physically and mentally. At the same time, the topography would also keep the relatively small population contained to one region, which Wallace argued allowed the human species to establish a suite of common characteristics before migrating out of the region and diversifying.

Wallace's reasoning was also confirmed, he felt, by the skin tone of the modern peoples of the Central Asian plateau-lands. The 'Mongolian' race, as he described them, "retains a color of the skin midway between the black or brown-black of the negro, and the ruddy or olive-white of the Caucasian types, a color which still prevails over all Northern Asia, over the American continents, and over much of Polynesia."[150] Migration and the influence of different climates modified human physiology, and subsequent migration, conquest, and population mixing "led ultimately to that puzzling gradation of types which the ethnologist in vain seeks to unravel."[151]

Language did not come directly into Wallace's arguments in 1889, even though it had played an important role in some of his earlier work on the origins and development of the human species. When Wallace had tried to broker agreement between the monogenist and polygenist camps in the London Anthropological Society in the 1860s, he had offered language as the defining element of the animal-human boundary in evolutionary history.[152] But at the same time, the evolutionary acquisition of language had been a gradual process, and Wallace attempted to reach a compromise between the monogenists and polygenists by arguing that while

[149] Wallace, 460-461.
[150] Wallace, 460-461.
[151] Wallace, 460-461.
[152] Alfred Russell Wallace, "The Origin of Human Races and the Antiquity of Man deduced from the theory of 'Natural Selection,' *Journal of the Anthropological Society of London* 2 (1864), 158-187. While the polygenists are usually remembered (accurately) as apologists for both slavery and white supremacy, this article demonstrates that monogenists were also able to justify violently racist positions from within their scientific framework.

'early man' had consisted of a single homogeneous population, racial differentiation had taken place before humans had fully acquired either language or fully developed intelligence – a position that would technically permit equating separate races with separate species while still supporting a Darwinian position of common descent. By the 1880s, the monogenesis-polygenesis conversation was not as lively as it had been twenty years earlier, in part because committed polygenists had refocused their attention on simply asserting that present day human races were fundamentally unequal and that racial difference was permanent.[153] Likewise, Wallace's intellectual circles put him close to the epicenter of the anthropological and ethnological push against reading language as a meaningful indicator of race. He had completed his masterwork, *The Geographical Distribution of Animals*, in 1876, and biogeography and the influence of climate on species change increasingly played a larger role in his scientific work.[154] By the 1880s, he had diverged from evolutionism as Darwin had presented it, instead arguing that some supernatural force or spiritual impulse was required to explain the ultimate ascent of humankind to its culture- and morality-possessed state.[155]

Even for a book that was explicitly *about* 'Darwinism,' and that examined the relationship between Darwinian theories and the origins of humankind, Wallace's text did not take Darwin's arguments for the African origins of humankind as something worth

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[153] Robert Bernasconi gives a useful overview in his introduction in Robert Bernasconi, ed. *American Theories of Polygenesis*, 7 volumes. (Bristol: Thoemmes, 2002), 1: v-xiii. See also Peter J. Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: The Johns Hopkins Press, 1986); and Ann Fabian, *The Skull Collectors: Race, Science, and America's Unburied Dead*. (Chicago: University of Chicago Press, 2010).

[154] Alfred Russel Wallace, *The Geographical Distribution of Animals: with a Study of the Relations of Living and Extinct Faunas as Elucidating the Past Changes of the Earth's Surface*, 2 vols. (London: Macmillan and Co., 1876).

[155] Wallace had begun to suggest that natural selection could not fully account for the mental development of modern humans in an article published in the *Quarterly Review* in April 1869, much to Darwin's irritation. See Browne, *Power of Place*, 317; Malcolm Jay Kottler, "Alfred Russel Wallace, the Origin of Man, and Spiritualism," *Isis* 65, no. 2 (June 1974), 144-192; and Peter Raby, *Alfred Russel Wallace: A Life* (Princeton: Princeton University Press, 2002).

mentioning.[156] Wallace's biogeographically-informed argument differed very little from John Bachman's 1850 thesis of human geographic origins, which derived from analysis of Biblical texts. With so much general agreement of result, if little agreement in method, Darwin's diffidently offered African origins hypothesis easily retreated into the background noise of late Victorian science, before being even more eclipsed in the early 1890s by the possible discovery of the long-sought "missing link."

Ernst Haeckel's Speechless Ape:

In 1868, the German evolutionist and Darwin popularizer Ernst Haeckel published the first edition of his *Natürliche Schöpfungsgeschichte*, translated in English as *Natural History of Creation*.[157] The purpose of the book, which was a reprise of ideas that Haeckel had developed for a series of popular lectures on Darwinism, was to introduce the Germanophone public to the ideas of natural selection and descent with modification, and especially to consider how these ideas might be applied to the evolution of humankind, which Darwin had deliberately not addressed in *Origin*. *Natürliche Schöpfungsgeschichte* went through twelve German editions

[156] What was actually meant by "Darwinism," like "evolutionism," was highly variable, depending on the author and the point he (almost always 'he') was trying to make.

[157] Ernst Haeckel, *Natürliche Schöpfungsgeschichte: Gemeinverständliche wissenschaftliche Vorträge über die Entwickelungslehre im Allgemeinen und diejenige von Darwin, Goethe, und Lamarck im Besonderen, über die Anwendung derselben auf den Ursprung des Menschen und andere damit zusammenhängende Grundfragen der Naturwissenschaft* (Berlin: Verlag von Georg Reimer, 1868). The first English edition was published in 1876, translated by E. Ray Lancaster: Ernst Haeckel, *The Natural History of Creation: Or the Development of the Earth and Its Inhabitants by the Action of Natural Causes. A Popular Exposition of the Doctrine of Evolution in General and of that of Darwin, Goethe, and Lamarck in Particular*, trans. E. Ray Lancaster, 2 vol. (London: Henry S. King & Co., 1876). The similarity between Haeckel's title and *Vestiges of the Natural History of Creation* was deliberate; see discussion in Robert J. Richards, *The Tragic Sense of Life: Ernst Haeckel and the Struggle Over Evolutionary Thought* (Chicago: University of Chicago Press, 2008), 223-224.

between 1868 and 1920, as well as multiple editions in translation. Observers have argued that it was one of the most successful popular science books of the nineteenth century.[158]

Born in 1834 in Potsdam, Ernst Haeckel had been raised on a mixed diet of German Romanticism, especially Goethe, and of scientific exploration narratives, including Alexander von Humboldt's writings on South America or Charles Darwin's tales of his time on the *Beagle*. Like Darwin, Haeckel was also reluctantly educated in medicine by dint of paternal suasion, although, unlike Darwin, Haeckel finished his course, receiving his degree in 1857. He specialized in comparative anatomy before becoming entranced by marine biology, and gave lectures on evolution to packed lecture halls after he attained a permanent post at the university in Jena in the early 1860s. Where Darwin was rooted in natural history and the genteel life of the English countryside, Haeckel was steeped in the intellectual ferment of German Romanticism and the lively philological traditions of both Berlin and Jena.[159] Philological inquiry was a live subject, and even as the world of the German university tacked towards increased professionalization and specialization, Haeckel remained in contact with many of the latest developments in the historical study of language, both through intellectual proximity and his friendship with many distinguished German academics, including his close friend, the philologist August Schleicher.[160]

From the first edition of *Natürliche Schöpfungsgeschichte*, Haeckel was not reticent about human evolution, although he carefully traced a lengthy and impeccable lineage of distinguished men of science and letters, ranging from Immanuel Kant to Karl Ernst von Baer, to

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[158] Richards, *Tragic Sense of Life*, 223. Richards adds: "At the beginning of the twentieth century, the geneticist and historian of biology Erik Nordenskiöld judged the *Natural History of Creation* 'the chief source of the world's knowledge of Darwinism.'" (Richards, 223. Quote from Nordenskiöld, *The History of Biology: A Survey (1920-1924)*, trans. Leonard Eyre, 2nd ed. (New York: Tudor, 1936), 515.)
[159] Richards, *Tragic Sense of Life*, 37.
[160] On professionalization and the intellectual development of philology, see Turner.

show how other, specifically German, thinkers had anticipated Darwin's work.[161] Evolution was normalized against the larger sweep of eighteenth and nineteenth century German intellectual production. There was no need for any supernatural force or divine intervention to direct the creation of the human species. Instead, to explain the "origin and pedigree of Man," Haeckel turned to comparative anatomy, and emphasized the important similarities between humans and the other great apes. Orangutans were most like humans in terms of the structure and development of the brain, although chimpanzees had the most similar skulls. Gorillas were the most similar "with regard to the development of the feet and hands," and gibbons in terms of the development of the chest structure.[162] All these species had more in common, anatomically, with humans than with the lower primate species, although Haeckel emphasized that, in his view, none of these characters were more essential than the others. It was difficult to claim that humans were most closely related to one particular species of great ape.[163] After all, humans were not descended from any one of the living ape species, but shared a long-dead common ancestor from which the modern higher primates all derived.[164]

In examining the long process by which evolution had produced humanity, Haeckel walked his readers through twenty-two stages, from monera (stage 1) to single-celled organisms

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[161] Richards, *Tragic Sense of Life*, 227.
[162] Haeckel, *Natürliche Schöpfungsgeschichte* (1868), 498.
[163] The Biodiversity Heritage Library has scanned Darwin's copy of the first German edition of *Natürliche Schöpfungsgeschichte*, complete with his annotations. In this section, Darwin underlined the entire sentence: "…dass nämlich jeder von den vier Menschenaffen dem Menschen in einer oder einigen Beziehungen näher steht, als die übrigen, dass aber seiner als der absolut in jeder Beziehung menschenähnlichste bezeichnet werden kann." (498) All translations from German (except when marked as quotations from the 1876 English edition) are my own, although I've cross-compared important passages with Lancaster's 1876 translation.
[164] Haeckel, *Natürliche Schöpfungsgeschichte* (1868), 499. "Die affenartigen Stammeltern des Menschengeschlechts sind längst ausgestorben." Translating this section in 1876, Lancaster's text adds a line that does not appear in the first German edition, immediately following this line: "We may possibly still find their fossil bones in the tertiary rocks of southern Asia or Africa." See Lancaster, trans. *Natural History of Creation* vol. 1 (1876), 277.

(2) to sack-worms (8 – end invertebrate stage) to mud-fish (12) to 'semi-apes' (18) to 'man-like apes' (20) to 'ape-like Men (pithecanthropi)' at stage 21, and then full humans at stage 22. The penultimate stage consisted of the "*Affenmenschen"* (*Pithecanthropi*, or Ape-men) or "sprachlose Menschen" (*Alali,* speechless) who had become completely adapted to bipedal movement, with a resulting structural differentiation between hands and feet.[165] Still, by dint of being speechless, this hypothetical 'missing link' between the anthropoid apes and modern humans could not be considered representative of full humankind. For Haeckel, the emergence of humanity was a two-stage development, where the first stage was the development of bipedalism and the second was the development of language, which allowed for the development of abstract thought and higher consciousness. This development was glossed neatly in E. Ray Lancaster's 1876 English edition:

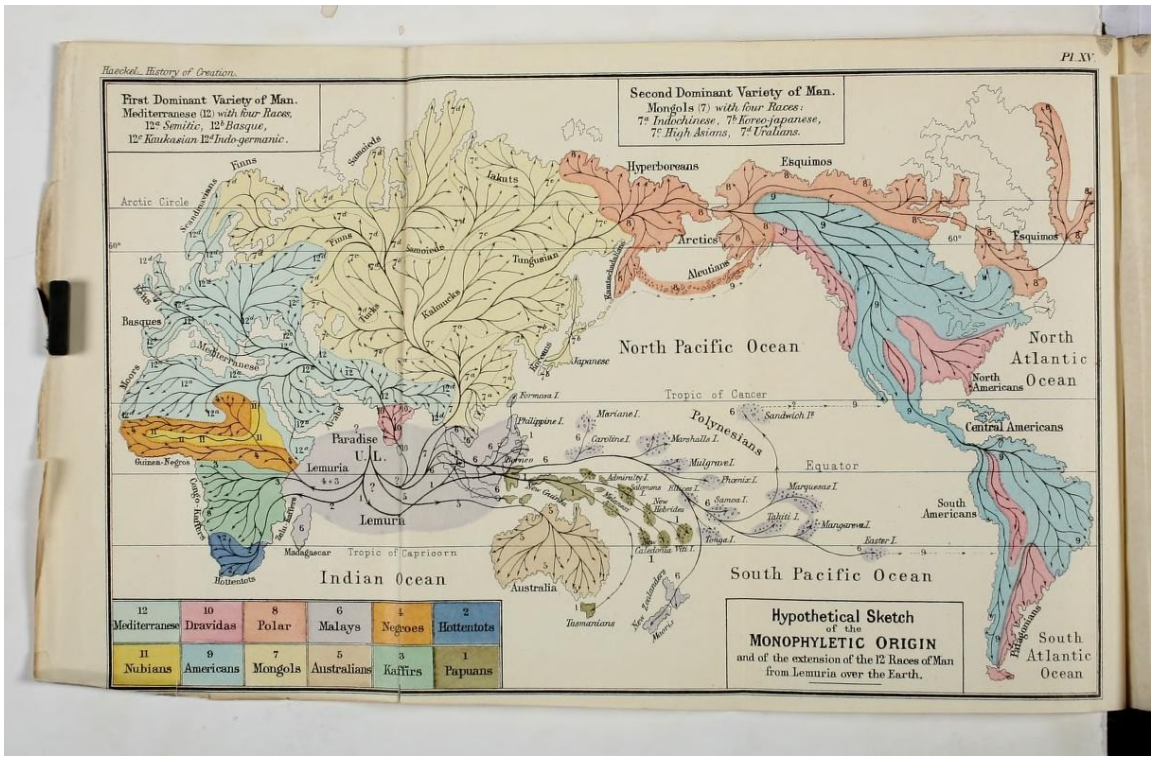
> The *certain proof* that such Primeval Men without the power of speech, or Ape-like Men, must have preceded men possessing speech, is the result arrived at by an inquiring mind from comparative philology (from the "comparative anatomy" of language), and especially from the history of the development of language in every child ("glottal ontogenesis") as well as in every nation ("glottal phylogenesis").[166]

The origin point for the development of the primordial ape-human ancestor was "likely in southern Asia or eastern Africa" in the 1868 edition. By the time of the second edition, in 1870, Haeckel suggested a lost continent of "Lemuria," formerly located in the Indian Ocean, as the most likely candidate for humanity's "Paradise" or first homeland.[167] In general, though, he preferred an Asian theory of origins, and the maps and other illustrations in subsequent editions of *Natural History of Creation* showed vectors of proto-human migration that moved up through

[165] Haeckel (1868), 507.
[166] Lancaster, trans. *Natural History of Creation* vol. 1 (1876), 293-294.
[167] Haeckel, *Natürliche Schöpfungsgeschichte* (Berlin: Verlag von Georg Reimer, 1870), 678.

the Indian subcontinent and then out through the rest of Eurasia, further cementing the impression of Asian origins in the minds of Haeckel's readers.[168]

The evolutionary origins of language, and the applicability of the biogenetic law to language development and acquisition were both acrimonious topics of discussion in European scholarly circles at the time Haeckel was working on the early editions of his book.[169] For example, on its founding in 1865, the Société de linguistique de Paris adopted a constitution that specifically prohibited any communications speculating on the problem of the origin of language.[170]



[168] See "Taf. XV (am Ende des Buches)," in Haeckel, *Natürliche Schöpfungsgeschichte* (1870), 677-678. Richards notes that the human dispersal map was replicated through all subsequent editions of the book, through the 12th edition in 1920, although Haeckel emphasized that lack of actual fossil evidence made the map strictly hypothetical. See Richards, *Tragic Sense of Life,* 252.

[169] See Radick, *Simian Tongue*.

[170] James H. Stam, *Inquiries into the Origin of Language: The Fate of a Question* (New York: Harper & Row, Publishers, 1976), 255. The constitution also specifically banned communications on constructed languages.

Figure 2 Plate XV (foldout map), "Hypothetical Sketch of the Monophyletic Origin and of the extension of the 12 Races of Man from Lemuria over the Earth," in Ernst Haeckel, *The Natural History of Creation: Or the Development of the Earth and Its Inhabitants by the Action of Natural Causes. A Popular Exposition of the Doctrine of Evolution in General and of that of Darwin, Goethe, and Lamarck in Particular,* trans. E. Ray Lancaster, 2 vol. (London: Henry S. King & Co., 1876). Biodiversity Heritage Library.

However, Haeckel did not have to rely on arguments derived from linguistics alone. The logics of comparative anatomy as well as comparative philology seemed to support Haeckel when he argued that ape-like men could have emerged in a lost continent under the Indian Ocean, spreading out with their fellow primates into the eastern coast of Africa, the Indian subcontinent, and especially the Indonesian archipelago. Haeckel was prepared to entertain the idea that a separate group of proto-humans had moved from Lemuria to the eastern coast of Africa, diverging from their Asia-bound brethren and developing their own language there, but this possibility was largely irrelevant, both an evolutionary and an intellectual dead end.[171]

While believing firmly in the monogenetic unity of the human species—since, Haeckel wrote, humans from different groups were demonstrably capable of interbreeding—he was not entirely convinced that human language was also of a single origin. In fact, it would rather nicely explain the hierarchy of human races that Haeckel had proposed if human language was not from a common source, and if the acquisition and then development of more elaborate forms of language had reciprocally shaped the development of the human brain.[172] The most highly developed of the races, in Haeckel's hierarchy, were the Indo-Germans—conveniently enough, both Haeckel's own racial type and that of his target audience. The Indo-Germans were also the inheritors of a language that could be traced back to a great antiquity in Central Asia—a distinguished lineage indeed, and Haeckel had no problems combining linguistic and racial

[171] Richards, *Tragic Sense of Life*, 252.
[172] Richards, *Tragic Sense of Life*, 244-255.

inheritance to suit his purposes. If this transition from *sprachlose Mensch* to speaking Man (ur-*sprechende Mensch*, perhaps) had taken place in Asia, then it followed that the fossil evidence of one of these transitional *Affenmensch* forms might also be found in that region.

Eugène Dubois Gets His Man(Ape):

"At the close of the nineteenth century we look with just pride on the mighty and incomparable advances which human science and culture have made during its course – the natural sciences excelling all others," Haeckel proclaimed to an audience of his peers at the Fourth International Congress of Zoologists in 1898.[173] It was Charles Darwin, Haeckel argued, who deserved the most credit for this effervescence of biological knowledge, and the most important deduction derived from Darwinian theory was the understanding of the biological origin of humankind. It was clear from comparative anatomical studies that humans were primates who shared a familial descent with the other great apes. It was even clear, to Haeckel at least, that facility with language was no barrier to human-ape kinship, with the "various sounds by which apes express their sensations and their wishes" being clearly analogous to the sounds that human infants and children make when learning to speak.[174] The next question was whether paleontological proof – "the true 'footprints of the Creator," joked Haeckel, a non-believer – could be discovered that would provide physical evidence of the last common human-ape ancestor. Could fossil evidence really "confirm the much-disputed 'descent of man from apes'?"

[173] Ernst Haeckel, "On Our Present Knowledge of the Origin of Man," Discourse delivered at the Fourth International Congress of Zoologists, Cambridge, UK, August 26, 1898. Translated and reprinted in *Annual Report of the Board of Regents of the Smithsonian Institution* (Washington DC: US Government Printing Office, 1898), 461-480.
[174] Haeckel, "On Our Present Knowledge," 466.

asked Haeckel. "According to our view, this question must be undoubtedly answered in the affirmative."[175]

Where would this fossil evidence be found? In 1891, Dutch physician Eugène Dubois excavated an unusual fossilized skullcap, tooth, and femur from the banks of the Solo River, in Trinil, Java. Originally trained in medicine, Dubois became a keen student of evolution during his university years in Amsterdam, where he coped with his deepening boredom with medicine by working hard at his morphology and comparative anatomy and reading voraciously about evolutionary theory. He was finally able to bring his salaried profession and his extracurricular interests into closer alignment when he accepted a position with the Netherlands Indies colonial medical service, sailing for Sumatra in 1887, with plans to use his available spare time to hunt for fossils of early humans in the Pleistocene deposits in the Sumatran jungle.[176] Dutch colonial rule in southeast Asia was critical for Dubois to be able to undertake his work; he had initially tried to secure independent research funding for excavations and found that no one in the Netherlands, at least, was willing to put down money on a likely wild goose chase.[177]

Until the 1890s, every mysterious proto-human fossil, like the bones of the Red Lady of Paviland, found in 1823, or the original Neanderthal skeleton found in 1856, had been discovered by accident, during casual explorations of cave deposits.[178] Dubois, though, had put

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[175] Haeckel, "On Our Present Knowledge," 469.
[176] Bert Theunissen, *Eugène Dubois and the Ape-Man from Java: The History of the First 'Missing Link' and its Discoverer* (Dordrecht: Kluwer Academic Publishers, 1989). See also Mary Bouquet, "Strangers in paradise: An encounter with fossil man at the Dutch Museum of Natural History," in Sharon Macdonald, ed. *The Politics of Display: Museums, Science, Culture* (London: Routledge, 1998), 159-172.
[177] Theunissen also makes the point that in 1885, when Dubois was attempting to shop his research proposal to the Dutch government, the Netherlands was at the nadir of a multi-year economic depression, and scientific research (especially with zero economic applicability) was not a financial priority. See Theunissen, 32.
[178] On the original discovery and changing interpretations of the Red Lady of Paviland, see Marianne Sommer, *Bones and Ochre: The Curious Afterlife of the Red Lady of Paviland* (Cambridge: Harvard University Press, 2008).

together a series of theoretical arguments that he used to argue for southeast Asia as a critical site for human evolutionary development, and then set out for the field to test his hypothesis through intensive excavation. Accidental discovery, after all, was cheap – but Dubois could not undertake a thorough, deliberate search for rare hominin fossils in southeast Asia without external financial support to purchase tools, hire guides and fieldworkers, and prepare any fossils for analysis and transportation back to Europe. The key challenge, for Dubois, was to make a convincing enough case for southeast Asia that someone would be willing to bankroll his expedition.

His first major article, which doubled effectively as a grant application to the Dutch government, was published in 1888 and dealt with the advisability of research into the Pleistocene fauna of the Netherlands Indies, with special focus on Sumatra.[179] Dubois' central argument was that the islands of the Netherlands East Indies, well-known as a biological treasure-house of living plant and animal species, were under-researched from the paleontological standpoint – a missed opportunity on many fronts, but especially because what little work had been done suggested that the Netherlands Indies might hold key clues to the history of the human race.[180]

Rather than deploying claims about the origins of human culture and language, Dubois, like Darwin, approached the problem from the ape side, thinking through what the last common ancestor of both modern humans and modern apes might have looked like, and especially where this species would have lived, drawing heavily on existing work in paleontology in India and other parts of Asia, and making good use of biogeographical studies that linked the Netherlands Indies archipelago to the Indian mainland. He acknowledged that Darwin suspected Africa was

[179] Eugène Dubois, "Over de wenschelijkheid van een onderzoek naar de diluviale fauna van Nederlandsch-Indië, in het bijzonder van Sumatra," *Natuurkundig tijdschrift voor Nederlandsch Indië* 48 (April 1888), 148-165.
[180] Dubois, "Over de wenschelijkheid," 148. All translations from Dutch by EMK.

the last ancestral home of the anthropoid apes, with the last common ancestor being in many ways more human-like than its presently living ape descendants.[181] Dubois described Wallace and Lyell as equivocal as to whether Africa or Asia was the "fatherland of the ancestors of the Anthropoids and of men."[182] "But," wrote Dubois, "none of these three great Englishmen knew yet of the Siwalik-chimpanzee," which made India the most probable last location of the ancient Anthropoid ancestors of modern apes and humans.[183] Since the Netherlands Indies shared flora and fauna, it was likely that further fossil apes could be found there, and that the balance of probability favored an Asian origin. Since Dubois was, above all else, asking for research money, he concluded on a note that tried to draw attention to the international dimensions of the problem: "The time cannot be too far off when foreign scholars will also train their eyes on the Netherlands Indies."[184]

The key items of interest in Dubois' 1888 article are two-fold. One, Dubois had read Darwin and was entirely aware of the latter's Africa hypothesis; he just found it unconvincing, especially in light of newly discovered fossil evidence. Secondly, the article shows Dubois had multiple strategies at his disposal to make the case for the paleontological significance of the Netherlands Indies in general, and Sumatra in particular. He could draw on data from

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[181] Dubois, "Over de wenschelijkheid," 161. Dubois quoted Darwin's argument from *Descent of Man* in German translation (*Die Abstammung des Menschen*), citing an 1886 omnibus German translation edition of Darwin's works. As other citations make clear, Dubois read English competently, but for whatever reason preferred to use this version of Darwin to make his point.

[182] Dubois, "Over de wenschelijkheid," 161. Dubois cited Wallace's noncommittal lines about whether chimpanzees, gorillas, or orangutans are most relevant for tracing human evolutionary history from his 1886 book *The Malay Archipelago*. As discussed earlier in this chapter, by 1889 Wallace felt the balance of probability lay in the direction of an Asian origins, although since his article was published in 1888, Dubois obviously couldn't cite the latest incarnation of Wallace's thoughts on the subject.

[183] Dubois, "Over de wenschelijkheid," 162. "Maar geen dezer drie groote engelschen [sic] kende nog den Siwalik-Chimpanzee, die voor ons Indië als laatste woonplaats der voorwereldlijke Anthropoïden waarschijnlijker maakt." On the discovery of the Siwalik fossil apes, and the broader history of paleoanthropology in South Asia, see Kenneth A.R. Kennedy, *God Apes and Fossil Men: Paleoanthropology in South Asia* (Ann Arbor: University of Michigan Press, 2000), especially ch 5.

[184] Dubois, "Over de wenschelijkheid," 164-165.

biogeography and the evidence from both extinct and living species that suggested the Malay archipelago had once been connected in some way to the mainland. He could argue from studies of glaciation and climatology that when the glaciers had advanced on the northern portion of the Indian subcontinent, the ancient ape ancestors could have moved down from the Siwalik Hills and taken to the islands in the sea, where they differentiated into the lines of descent that produced modern orangutans and modern humans. All these options could be weighed and placed on the balance on the side of Asia, even though Dubois acknowledged that Africa – tropical, equatorial, and possessing two ape species – was not entirely out of the question.

The remains Dubois found in 1891 seemed to fit Haeckel's prescription for a likely human-ape precursor species: the skull was small, and seemed morphologically intermediate between that of a chimpanzee and a modern human, while the femur suggested that the original owner had been capable of standing upright and walking on two feet. Dubois gave his find the Latin scientific name *Pithecanthropus erectus*, or "upright ape-man," calling back to Haeckel's *Pithecanthropus alalus*, "speechless ape-man," although in drafts of his article announcing the find, Dubois wavered between "man-ape" and "ape-man" before crossing the former option out and definitively settling on "ape-man."[185] The scientific name coexisted with the term preferred by the press, who dubbed the specimens "Java Man." In 1895, Dubois wrote to Ernst Haeckel, personally thanking him for his scientific inspiration and especially for his work in the *Natürliche Schöpfungsgeschichte*, which had directly inspired Dubois' excavations, as well as influencing the name that Dubois bestowed on his specimen.[186] Haeckel saw Dubois' discovery

[185] Personal communication, Dr. Natasja den Ouden (Naturalis Biodiversity Centre, Leiden), August 29, 2016.

[186] Richards, *Tragic Sense of Life*, 253. According to Richards, Dubois wrote to Haeckel on December 24, 1895. Haeckel had also advised Anton Dohrn, who briefly taught Dubois in the Netherlands. Dohrn was famously nasty and condescending towards other scientists, particularly later in life when he would have encountered Dubois. He was probably not the best introduction to Haeckel's work, but nonetheless was

as the clearest proof yet of the rightness of Darwinian evolutionary theory as applied to human evolution, but neither he nor Dubois were surprised to discover the "missing link" in Asia.

Since the fossils had been found in silt at the edge of the Solo River, isolated from any other proto-human remains, and in geological strata that suggested that flooding and volcanic activity had removed Java Man from his or her habitat, there was nothing that could help establish a relative chronology for *Pithecanthropus*, or establish the fossil's evolutionary context. Frustrated by a lack of further finds, as well as by the controversy attendant on the announcement of the discovery of the putative missing link between ape and human, Dubois resigned his commission and returned home to the Netherlands, where he entered a state of semi-reclusion and refused to show *Pithecanthropus erectus* to other investigators.[187] Java Man, though, remained very much at the forefront of the public imagination, both internationally and in the Netherlands, which embraced the find as a point of national scientific pride. A full-size sculpture of Java Man, standing upright and looking thoughtfully at a bone tool held in his right hand, was the showcase hit of the Dutch East Indies Pavilion at the Paris Exposition universelle in 1900.[188]

Conclusion

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another pathway by which Dubois encountered Haeckel's theories, especially about Lemuria and the Asian origins of humanity. On Dohrn and Haeckel's relationship, see Richards, 116-117.

[187] Dubois actually had a sign made for his laboratory after his return to the Netherlands, which read "Verzameling van Indische fossielen (collectie Dubois). Niet toegankelijk voor het publiek." In English: "Collection of Indies fossils (Dubois collection). Not open to the public." The sign now lives in the storeroom at the Naturalis that holds his massive collection of prehistoric fossilized fauna excavated in Sumatra and Java in the 1890s, although the original *Pithecanthropus* skullcap and femur (the most closely guarded of Dubois' fossils while he was alive) are on display in the main part of the museum.

[188] This statue, which is approximately six feet tall, is also held in the Dubois fossil collection at the Naturalis.

In the last quarter of the nineteenth century, several influential European philologists, ethnologists, and archaeologists began to doubt that the Aryan hypothesis was at all plausible. Neolithic remains in western Europe were unearthed in digging projects, or discovered by amateur archaeologists, their work inspired in part by books like Charles Lyell's *The Geological Evidences of the Antiquity of Man*. In fact, it was geological evidence that suggested that these "primitive men" of prehistoric Europe had fished, hunted, and made simple stone tools for a period much greater than the span of time that could be reconstructed using philological analysis.[189] One subset of scholars, including the French translator of Darwin, Clémence Royer, continued to advance the idea of some special Aryan racial-linguistic inheritance, but reversed the direction of historical migration, placing the ancient Aryan homeland in Lithuania, or even farther north in Scandinavia.[190]

Max Müller, once one of the foremost proponents of the Aryan hypothesis in the Anglophone world, tried to pick apart the threads of race and language that he had twined

[189] See Burrow, "The Uses of Philology in Victorian England," 202-203.

[190] Royer presented a paper on the subject at the International Anthropological Congress held in Brussels in 1872, and based her argument largely on patterns of hair color; many other arguments were made by other people, which cannot be discussed here. For thorough (negative) contemporary analysis of the many competing Aryan hypotheses of the late nineteenth century, see Salomon Reinach, *Origine des Aryens: Histoire d'un Controverse* (Paris: Ernest Leroux, 1892). (On Royer specifically, see Reinach, 50.) For a more dyspeptic English analysis of the same controversy, see Isaac Taylor, *The Origin of the Aryans: An Account of the Prehistoric Ethnology and Civilisation of Europe* (New York: Scribner and Welford, 1890). Taylor noted that the first scholarship in this arena was all German, and suggested as starting points Johann Gustav Cuno, *Forschungen im Gebiete der alten Völkerkunde*; Theodor Pösche, *Die Arier*; Karl Penka, *Origines Ariacæ* and *Die Herkunft der Arier*; and Otto Schrader, *Sprachvergleichung und Urgeschichte*. Even Thomas Henry Huxley weighed in, with an essay "The Aryan Question and Prehistoric Man" in 1890. See Thomas H. Huxley, *Man's Place in Nature* (1898), 272-280. Much more recently, Léon Poliakov has described French anthropologist Armand de Quatrefages proposing that some "savage" precursor race had lived in Scandinavia and northern Germany before being displaced by the Aryans, as this was the only way Quatrefages could make sense of the violence of the German bombardment of Paris during the Franco-Prussian War—their conduct was out of place for civilized people of the same Aryan heritage, and thus the Germans must have found their violent traits somewhere else deep in their ancestral past. See Poliakov, 261. The 'Aryan Controversy' of the 1890s seems to be the starting point for the slippage between "Nordic" and "Aryan" and the idea that the Aryans were blond and blue-eyed.

together two decades earlier. In 1888 he wrote that "Aryan" was a term designating a class of languages that shared a common ancestor, and nothing else:

> There is no Aryan race in blood, but whoever, through the imposition of hands, whether of his parents or his foreign masters, has received the Aryan blessing, belongs to that unbroken spiritual succession which began with the first apostles of that noble speech, and continues to the present day in every part of the globe. **Aryan, in scientific language, is utterly inapplicable to race**. It means language and nothing but language; and if we speak of Aryan race at all, we should know that it means no more than *x* + Aryan speech.[191]

Only a page later, Müller tangled the threads again. "But the old question returns," he wrote. "Can we not discover the cradle of our race? I say, decidedly we cannot."[192] There was no way to establish, with "mathematical certainty," the succession of movements of historical peoples across the Eurasian continent – even though this formulation reinforced the exact conflation of "people who speak Aryan" with "Aryan peoples" that he had renounced only a few pages earlier. If one were to ask where the "Aryan center" should be placed, geographically, Müller believed the answer would "vary considerably." Nonetheless, he wrote:

> "Somewhere in Asia" used to be the recognized answer, and I do not mean to say that it was far wrong; only we must not expect, in a subject like this, our much-vaunted mathematical certainty.[193]

Despite all, the idea of Asian origins still seemed to Müller to be the most reasonable and likely option, even as he railed against the conflation of language and race that underpinned that assertion. Several pages later, Müller wrote: "To me an ethnologist who speaks of Aryan race,

[191] F. Max Müller, *Biographies of Words and the Home of the Aryas* (London: Longmans, Green, & Co., 1888), 88-90. My emphasis.
[192] Müller, *Biographies of Words*, 91.
[193] Müller, *Biographies of Words*, 92-93.

Aryan blood, Aryan eyes and hair, is as great a sinner as a linguist who speaks of a dolichocephalic [long-skulled] dictionary or a brachycephalic [short-skulled] grammar."[194]

The "Aryan Controversy" of the 1890s may have been vicious in philological circles, but it was also increasingly irrelevant for studies of the origins of humankind.[195] While the philological and ethnological traditions had conditioned how Ernst Haeckel, for example, and many naturalists of his generation saw the world, the evidence the philologists and ethnologists had relied on was no longer paramount. Instead, anthropology and paleontology, alongside partner sciences like geology and climatology, were the most promising paths towards a "missing link." When Eugène Dubois unearthed his Java Man in 1891, he believed he had found evidence in favor of the Asian origins hypothesis, if by a different path of reasoning than Jones, Schlegel, Hegel, Bopp, von Humboldt, or even Müller had ever pursued.

One small fossilized skullcap and a peculiar femur, found by a cranky physician in a river bank far from the centers of scientific power could not be enough to convince the world that the out of Asia hypothesis was indisputably correct. Dubois' discovery, though, was a physical instantiation of the modern interpretation of one of Europe's oldest stories, that humanity began somewhere to the east. It was a physical piece of evidence that supported the conjectures of two of the most widely-read texts of popular evolutionist writing of the century, namely Haeckel's *Natürliche Schöpfungsgeschichte* and Chambers' *Vestiges of the Natural History of Creation*, which continued to out-sell Darwin's *Origin of Species* until the 1890s.[196] And behind these

[194] Müller, *Biographies of Words*, 120. Interpolated glosses in brackets are my own – the quip is meaningless to modern audiences unfamiliar with skull-measurement terminology. This line is often misattributed to Thomas Henry Huxley, because it was quoted in an address given by Julian Huxley, THH's grandson, in 1936. See Julian S. Huxley, "Eugenics and Society," The Galton Lecture, delivered before the *Eugenics Society* on February 17, 1936. Published in *The Eugenics Review* 28, no. 1, 18.
[195] On the late nineteenth century decline of philology, see Turner, *Philology*.
[196] See Secord, *Victorian Sensation,* epilogue.

nineteenth-century developments was a massive intellectual and religious tradition that established world human history as being based in and driven by populations in the northern half of the globe, moving back and forth across the continental mass of Eurasia, and that explicitly removed Africa from any active role in the history of humankind.

Chapter 2. EXTRACTIVE MAGIC

HUNTING 'DAWN MAN' IN INTERWAR ASIA

"Your good letter of last November has only just reached me, having gone the long journey round by the Ports instead of via Siberia," wrote Canadian physician and paleoanthropologist Davidson Black to a friend, British paleontologist David Meredith Seares Watson. "We have this week received the welcome word by cable from New York that the appropriation for the Chou Kou Tien work has been approved…as you say, the words 'primitive man' have the money-extracting 'majic' somehow worked into them."[197]

Black wrote from Beijing, where he was a professor at the Peking Union Medical College, and had received his cable from the home offices of the Rockefeller Foundation in New York, which in 1927 committed to funding an extensive program of excavations at Zhoukoudian (Chou Kou Tien). Members of the Chinese Geological Survey and faculty from the Peking Union Medical College had discovered a small number of human-like molar teeth in a quarry near this village, southwest of Beijing. While both the Chinese Geological Survey and the Rockefeller Foundation had been conducting and funding, respectively, extensive scientific fieldwork in China for more than a decade by the time of the Zhoukoudian discoveries, they were not the only participants in the ongoing hunt for the fossil remains of ancient hominins in China. Since 1921, the American Museum of Natural History had also been conducting expeditions in China and southern Mongolia, raising more than half a million dollars to finance a ten-year hunt for the ancestors of modern man. In France, the Muséum nationale d'Histoire naturelle, the Académie des Sciences, and the Ministère de l'Instruction publique sponsored a

[197] Davidson Black to DMS Watson, January 6, 1927. NCUACS 42.4.93/B.22 China, D.M.S. Watson papers, UCL Special Collections.

two-year mission to look for Paleolithic tools and human remains in the Yellow River and Ordos regions in northern China.

If the latter half of the nineteenth century was the period when the theoretical boundaries of the hypothesis on the Asian origins of humanity were being worked out, then it was the interwar period when these theoretical constructions were, for the first time, thoroughly investigated. In 1889, Alfred Russel Wallace glumly noted the lack of ancient human or proto-human ancestor fossil material, especially the absent "missing link," in all parts of the world other than Europe—which, for many reasons, Wallace was unwilling to accept as evidence that Europe was actually the human species' origin point. As discussed in chapter one, Wallace firmly believed that the first emergence of the human species had come in Asia, and while the lack of empirical evidence to support this claim bothered him, it was also quite easy to understand. "No part of the world is so entirely unexplored by the geologist" as the interior of Asia, declared Wallace.[198]

By the second decade of the twentieth century, geologists and paleontologists – not to mention surveyors, generals, physicians, priests, and professional adventurers – were exploring the regions that had been geological and historical blanks to Wallace, and attempting to prove new theories about the historical evolution of humankind. In the intervening decades, controversial new fossil discoveries at Trinil in Java and at Piltdown in Britain had raised new

[198] Alfred Russel Wallace, *Darwinism: An Exposition of the Theory of Natural Selection, With Some of its Applications* (London: Macmillan and Co., 1889), 458-461. While some exploration was taking place in the regions between the boundaries of the Russian and British empires as part of the 'Great Game' of imperial confrontation, large portions of the region were still unmapped, and formal geological analysis would only occur as part of industrialization projects in the twentieth century. See, for example, Kapil Raj, "When Human Travelers Become Instruments: The Indo-British Exploration of Central Asia in the Nineteenth Century," in Kapil Raj, ed. *Relocating Modern Science: Circulation and the Construction of Knowledge in South Asia and Europe, 1650-1900* (New York: Palgrave Macmillan, 2007), 181-222. For a triumphalist account of British spy-craft and surveying, see Peter Hopkirk, *The Great Game: On Secret Service in High Asia* (London: Murray, 1990).

questions about the processes of human evolution and differentiation away from the other anthropoid apes, helping to maintain human origins fossil research as a live topic of scientific interest.[199] In Europe, World War I had significantly limited the scope of domestic archaeological excavations, at least in France and Belgium. After the end of the war, international scientific attention turned towards investigating new regions for evidence of human origins, especially in remote inland regions in the newly declared Republic of China.

"For a long time, Asia, distant and mysterious, has seduced the imagination of thinkers, poets, and savants, who have invoked it as the solution for the most obscure problems," wrote French paleontologist Marcellin Boule in 1928.[200] As a result of these traditions, the continent had come to play a central role in ideas about the origins and dispersion of peoples, and, as Boule wrote, "This idea, that Asia is the cradle of humanity, probably has its source in very ancient traditions." Within this large continent, the border between China and Mongolia quickly came to stand in for all of "Central Asia" in paleoanthropological investigations because of the region's relative accessibility and political stability, compared to other areas in the heart of the Eurasian plateau.[201] When his junior colleague Pierre Teilhard de Chardin wanted to do fieldwork to investigate evidence of human evolution, Boule sent him to Beijing.

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[199] For an overview of the discovery of Java Man, see Bert Theunissen, *Eugène Dubois and the Ape-Man from Java: The History of the First Missing Link and Its Discoverer* (Dordrecht: Kluwer Academic Publishers, 1989); and Pat Shipman, *The Man Who Found the Missing Link: Eugène Dubois and His Lifelong Quest to Prove Darwin Right* (New York: Simon and Schuster, 2001). On Piltdown, see Frank Spencer, *Piltdown: A Scientific Forgery* (London: Oxford University Press, 1990); and Isabelle De Groote et al., "New genetic and morphological evidence suggests a single hoaxer created 'Piltdown Man,'" *Royal Society Open Science* 3, no. 160328 (10 August 2016). DOI: 10.1098/rsos.160328

[200] Marcellin Boule, "Introduction," in M. Boule, H. Breuil, E. Licent, et P. Teilhard, *Le Paléolithique de la Chine*, Archives de L'Institut de Paléontologie Humaine, Mémoire 4 (Paris: Masson et Cie, 1928), i.

[201] The dry climate in the areas around the Gobi Desert was an additional draw, since environmental conditions were excellent for fossil preservation. Little was known about the age or geological characteristics of the rocks in the region before systematic surveying began in the 1920s.

Three paleoanthropological expeditions undertook fieldwork in China and Mongolia during the 1920s and 1930s, and all of them sought fossil evidence of the origins of humankind: the Central Asiatic Expeditions of the American Museum of Natural History; Émil Licent and Pierre Teilhard de Chardin's expeditions to the Ordos plateau and Yellow River valley; and the Chinese Geological Survey's excavations at Zhoukoudian. Influenced by biological and cultural traditions, and working from inductive hypotheses of mammalian dispersion, these expeditions were able to mobilize substantial financial resources and publicity in support of their work, and in so doing solidified the status of the Asian origins hypothesis of human evolution, even as the "missing link" remained elusive.

Despite the similarities in their programmatic goals, these three expeditions worked in very different ways. These differences were most notable in terms of their sources and amounts of research funding, organizational structures and institutional relationships, and especially positions in relation to the international political community and the government of republican China. Many foreigners worked for the Chinese Geological Survey, and personnel from the French and American expeditions joined each other's digs and enjoyed personal and professional contact with Chinese geologists and other foreign colleagues. But there was also a marked international competition for scientific specimens that continued until the late 1920s, when the Chinese government moved to halt what it viewed as an exploitative removal of the country's natural resources and cultural patrimony.

It was not also always clear whether international researchers in China were there as representatives of their home governments. European scientific advisors had been present in China since at least the Ming dynasty, and late Qing modernizers partnered with Protestant missionaries to develop arsenals, shipyards, technical schools, and translation bureaus:

institutions that outlived the Qing dynasty and fed the growth of republican-era projects like the Chinese Geological Survey.[202] Americans researchers in particular were willing to switch quickly between presenting themselves as part of an apolitical international scientific brotherhood, and leveraging their connections to American business and diplomatic power to get their way. Scientists' machinations for field access, political influence, and control over the export or ownership of specimens reveal both the international competitive marketplace for scientific status and the comparative limitations and advantages of different political relationships and styles of organizing and funding scientific expeditions.

Lastly, this chapter makes an important historiographic intervention. In the narratives of twentieth century paleoanthropology, authors like Roger Lewin, Peter Bowler, and Martin Meredith have focused on the 1920s as a key decade in the history of human evolution research because of Raymond Dart's 1925 discovery of the 'Taungs Child' (*Australopithecus afarensis*) in South Africa.[203] As a result, their analyses of this period focus on understanding why Dart's claim to have found the "missing link" was not taken seriously by other members of the international scientific community, and why *Australopithecus* was not recognized as a key early member of the human family tree until the 1950s. While Dart's discoveries are certainly important in the history of twentieth century paleoanthropology, the historiographic emphasis on his work ends up making South Africa appear to be the most important site in paleoanthropology

[202] See, for example, Florence C. Hsia, *Sojourners in a Strange Land: Jesuits and Their Scientific Missions in Late Imperial China* (Chicago: University of Chicago Press, 2009); Benjamin Elman, *A Cultural History of Modern Science in China* (Cambridge: Harvard University Press, 2009); Fa-ti Fan, *British Naturalists in Qing China: Science, Empire, and Cultural Encounter* (Cambridge: Harvard University Press, 2004); and Ruth Rogaski, *Hygienic Modernity: Meanings of Health and Disease in Treaty-Port China* (Berkeley: University of California Press, 2004).

[203] See Peter Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1986); Roger Lewin, *Bones of Contention: Controversies in the Search for Human Origins*, 2nd ed., with a new afterword (Chicago: University of Chicago Press, 1997); and Martin Meredith, *Born in Africa: The Quest for the Origins of Human Life* (New York: Public Affairs, 2011).

in the 1920s. This chapter suggests that at least part of the reason why Dart was not taken seriously was because the world's newspapers – not to mention the world scientific community – were trumpeting the search for 'primitive man' in Asia. Sigrid Schmalzer has shown how vibrant the paleontological community in China was in the 1920s, and centers her analysis on the meaning of 'Peking Man' as a distinctly Chinese scientific discovery, and as a touchstone for the concept of 'Man the Maker' (*Homo faber*) in the People's Republic of China after 1949.[204] I look instead at how the idea of China-as-cradle-of-humanity and, ultimately, the fossil finds known as Peking Man were interpreted as part of the solution to a global problem of human evolution, the question of the location of the original ancestor of the entire human race, and to how discoveries and publicity about the quest for the cradle of mankind in China shaped international scientific opinion on the status of the Asian origins hypothesis. Schmalzer has written compellingly about the status that this hypothesis continues to hold with some members of the Chinese paleontological community, and in this chapter, I return to a time when that was the dominant scientific belief held in the international community as well.

This Business of Exploring

In May 1921, Roy Chapman Andrews began his first article on the Third Asiatic Expedition: "I find that I am not alone in wishing to discover what the newspapers term the 'missing link.' Considerably more than 2,500 other persons, 'male, female and young,' have signified in applications to join the Third Asiatic Expedition that their lives will be blighted

[204] Sigrid Schmalzer, *The People's Peking Man: Popular Science and Human Identity in Twentieth Century China* (Chicago: University of Chicago Press, 2008). On the interwar Chinese paleoanthropological community, see also Hsiao-pei Yen, "Constructing the Chinese: Paleoanthropology and Anthropology in the Chinese Frontier, 1920-1950," (PhD dissertation, Harvard 2012).

forever if they too are not allowed to participate in the search."[205] Between 1920 and 1931, the American Museum of Natural History spent over half a million dollars to explore the Gobi Desert and surrounding countryside in Mongolia and northern China and hunt for evidence of the origins of mammalian life and fossil evidence of human evolution. Although other researchers and expeditions were conducting paleontological research in China and other parts of inland Asia at the same time, the public profile and financial balance sheet of the AMNH expeditions put their work in a category of its own.

The AMNH Central Asiatic Expedition leadership reformulated the problem of the "missing link" as not a question of evolutionary hypotheses, but as one of good expedition management. They framed their intervention as methodological not theoretical. For Andrews and long-time museum president Henry Fairfield Osborn, who took an abiding personal interest in the expeditions, the validity of the Asian origins hypothesis was not in question—the only question was who (person, institution, nation) would get the credit when the so-called "Dawn Man" was found.

But where should they start looking? In an article published in 1900, Osborn had proposed an idea of a center of radiating evolutionary dispersion, located somewhere in Eurasia, as a way to explain the similarities between both living and fossil creatures found in comparable strata in Europe and North America. [206] At the time, similar fossil rhinoceroses had recently been unearthed in both southern France and Colorado, suggesting that there was some kind of similar ancestor between the two descendants. Osborn proposed to locate that last common ancestor by triangulating backwards and splitting the distance geographically, assuming the existence of land

[205] Roy Chapman Andrews, "Digging for the Roots of Our Family Tree," *Asia* 21, no. 5 (May 1921), 439.
[206] Henry Fairfield Osborn, "The Geological and Faunal Relations of Europe and America During the Tertiary Period and the Theory of the Successive Invasions of an African Fauna." *Science* 11, no. 276 (April 13, 1900), 561-574.

bridges linking North America and Asia at the Bering Strait. These ideas were not particularly unusual at the time—the running controversy over the concept of continental drift had come to prefer an explanation based on rising and falling sea levels and disappearing land bridges linking Asia and North America, or an Antarctic supercontinent to South America, the southern tip of Africa, and Australia and New Zealand.[207] Osborn imagined the existence of a few different centers of radiating evolution. In the southern hemisphere, the disappearance of the land bridges happened much earlier, making Africa "a great center of independent evolution" for certain distinct families of animals.[208] But other species had "an exclusively Eurasiatic history, so far as we know," and Osborn imagined a Eurasian center of dispersion, located somewhere closer to the Asian side of the landmass, for better access to North and South America. He imagined that most of the world's mammals had probably originated at this evolutionary center point, including lemurs, the anthropoid apes, and (later) humans.[209]

[207] See Naomi Oreskes, *The Rejection of Continental Drift: Theory and Method in American Earth Science* (New York: Oxford University Press, 1999).
[208] Osborn, "Geological and Faunal Relations," 569. Examples of African-origin animals included "the Anomalures or peculiar flying rodents of Africa," and "the Pangolins and Aardvarks."
[209] Osborn, "Geological and Faunal Relations," 570.

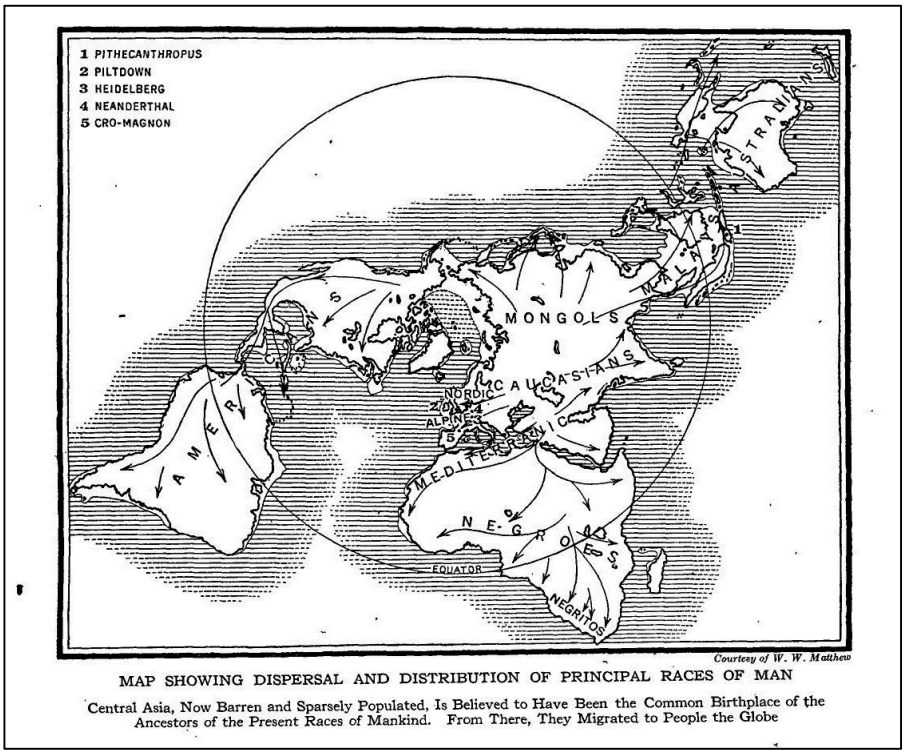


Figure 3 Roy Chapman Andrews, "Digging for the Roots of Our Family Tree," *Asia* 21, no. 5 (May 1921), 441.

In 1915, another scientist proposed a mechanism that could plausibly drive this model of radiating evolutionary change. William Diller Matthew, a Canadian geologist at the time working at the American Museum of Natural History, published a monographed titled "Climate and Evolution."[210] An intervention in the ongoing argument over the historical stability of the continents and whether landforms could move, Matthew proposed that variability in many species could be understood as adaptations to changing climates. To understand evolution, one should look towards a portion of the world where there was geological evidence of repeated cyclical climate changes that could be explained just through shifts in elevation and rainfall – like, for example, the high plains of Mongolia and especially the Gobi Desert.[211] Matthew

[210] William Diller Matthew, "Climate and Evolution," *Annals of the New York Academy of Sciences* 24 (February 18, 1915), 171-318.
[211] Matthew, "Climate and Evolution," 209.

worked through examples of the geographical distribution and evolutionary history of four orders of reptiles (living and extinct), fourteen orders of terrestrial mammals, and then wrote three additional sections on the distribution of birds, amphibians, and fresh water fish.

When he turned towards humans, Matthew affirmed that "All authorities are to-day agreed in placing the center of dispersal of the human race in Asia."[212] The central arid plateau contained the remains of "civilizations perhaps more ancient than any of which we have on record." The earliest recorded civilizations in the Indus, Yangtze, Nile, and Tigris and Euphrates river valleys were ranged in almost equal distances away from this point. Even as humans spread out over much of the globe, these primeval dispersion patterns continued: Europe had been invaded repeatedly in the "prehistoric, classical and mediaeval times" from the east. Invasions in India always came from the north, while "in the Chinese Empire, the invasions come from the west."[213] These repeated patterns suggested that the surest way to find the remains of the original progenitor of the human species was to look at the locus of dispersion that had shaped the course of human history since the species' birth. Thus, to find the ancestors of humankind, the AMNH had to go to Mongolia.

Getting Started

The Third Asiatic Expedition began in April 1921, when Roy Chapman Andrews and Yvette Andrews arrived in Peking, setting up the expedition's headquarters in the neighborhood occupied by the foreign legations and embassies.[214] They were soon joined from New York by paleontologist Walter Granger, the associate curator of fossil mammals at AMNH, and Clifford

[212] Matthew, "Climate and Evolution," 209.
[213] Matthew, "Climate and Evolution," 210.
[214] Roy Chapman Andrews, "Politics and Paleontology," *Asia* 22, no. 5 (May 1922), 360-364, 400-401.

Pope, who was in charge of collecting fish, reptiles, and amphibians.[215] The first year was spent conducting preliminary investigations in different parts of the Chinese interior, establishing diplomatic relationships with both the American legation and different representatives of the Chinese government, and beginning to hire technicians, fieldworkers, and other support staff in Beijing.[216]

As preliminary fieldwork got underway in July 1921, Andrews wrote to Osborn to update him on their progress in northern China. Clifford Pope and Walter Granger had arrived safely, and Andrews was busy making sure that they were introduced to leading figures in Chinese geology and paleontology, particularly Dr. V.K. Ting, the head of the Chinese Geological Survey.[217] Ting was one of the foremost figures in Chinese geology, both institutionally and intellectually. Together with H.T. Chang, he had organized a school for domestically training surveyors and geologists in 1913, which grew into the Geological Survey of China by 1916. [218] They were joined by J. Gunnar Andersson, a sometime member of the Swedish Geological Survey in China, who subsequently devoted his entire career to topics of Chinese geology, paleontology, and prehistoric archaeology. By 1921, the Survey's responsibilities had grown to include conducting systematic surveys of the Chinese countryside, leading mineral prospecting expeditions, and supporting geological education and research. [219] Practically as well as

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[215] Andrews to Osborn, July 18, 1921. (CA 1077.1a, 252). See also "Politics and Paleontology," 360-361.
[216] Andrews to Osborn, July 18, 1921. (CA 1077.1a, 252). A key early hire was translator and paleontologist James Wong. Andrews also hired five Chinese students who were in training as zoological collectors, although their names are not preserved in the expedition records
[217] Andrews to Osborn, July 2, 1921. (AMNH CA 1077.1, 252.)
[218] Andersson, "The National Geological Survey of China," 20. Chang (Zhang Hongzhao) was a graduate of Tokyo University, and appointed chief of the geological section of the Department of Mines in the new Chinese republican government. Ting (Ding Wenjiang) came from a different geological tradition, having been a student of the British geologist J.W. Gregory at the University of Glasgow. See also Yen, "Constructing the Chinese," 25-26.
[219] See: H.T. Chang, "The Geological Survey of China." *Science* 56, no. 1444 (September 1, 1922), 233-237; and J.G. Andersson, "The National Geological Survey of China," *Geografiska Annaler* 3 (1921), 305-310.

symbolically, the Survey also took on the task of promoting modernization and advancing the cause of national unification, a task of "unearthing the nation," to use the title of Grace Yen Shen's account of the Chinese Geological Survey.[220] The Survey also served the cause of modernization and state building in a very practical way, by leading efforts to identify and exploit the country's many potential sources of mineral and petrochemical wealth, a project that would later prove critical to the survival of the Chinese government in exile in Chongqing during the Second World War.

Human origins research presented very little direct economic value to oil and mineral prospectors, or to the governments that authorized them, but still benefitted from the expansion of international interest, institutional and financial support, and scientific data that came from the expansion of geological surveying after World War I. The war raised the value of geology and its cousin discipline paleontology as it became increasingly clear that industrial development and the petroleum-powered navy were going to be crucial to the future survival of the modern militarized nation-state.[221] One net result was that geological surveying and resource prospecting became increasingly important for governments. In the interwar decades of the 1920s and 1930s, many parts of the world were thoroughly surveyed by geologists. This expansion of international interest and institutional support, and the subsequent growth in the volume of geological survey data, carried significant benefits for researchers around the world who were investigating human origins.

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[220] Grace Yen Shen, *Unearthing the Nation: Modern Geology and Nationalism in Republican China* (Chicago: University of Chicago Press, 2014).

[221] On WWI and the interwar global oil market, see Gregory P. Nowell, *Mercantile States and the World Oil Cartel, 1900-1939* (Ithaca: Cornell University Press, 1994). On technology change and WWI, see David Edgerton, *The Shock of the Old: Technology and Global History since 1900* (New York: Oxford University Press, 2007).

Throughout the 1920s, the Survey played a key role as an organizing force in the Beijing scientific community, and acquired an interesting coterie of foreign scientists, who joined the ongoing work with varying degrees of both enthusiasm and chauvinism.[222] Hsiao-pei Yen has described the dynamic of what she terms the "Peking Circle" of elite foreign and Chinese geologists as highly collegial, brought together by a common interest in human paleontology and the search for the "missing link."[223] This collegiality is certainly apparent in many of the public interactions between the different major figures in this group, but many private sources speak to a slightly more complicated tension between cooperation and a desire for scientific achievement, and personal and national pride.

To supplement the work of the Survey, which was now also associated with the geology department at Peking University, to whom it had largely offloaded the task of training the next generation of Chinese geologists, Ting and others created the Geological Society of China in 1922. Its explicit mission was defined as supporting the "full and free discussion of the principles and problems of [geology]," and helping advance the scientific life of republican China.[224] At the first general meeting, held in March 1922, the opening addresses by V.K. Ting and H.T. Chang were followed by brief speeches by Roy Chapman Andrews and Walter Granger. Andrews expressed the envy of American and European scientists of the paleontological riches to be found in conveniently adjacent countryside, "unrivalled in importance and interest."[225] Granger spoke

[222] See Shen, ch 3; Yen, ch 1.
[223] Yen, "Constructing the Chinese," 22-39. See also Hsiao-pei Yen, "From Palaeoanthropology in China to Chinese Palaeoanthropology: Science, Imperialism, and Nationalism in North China, 1920-1939," *History of Science* 53, no. 1 (2015), 21-56.
[224] V.K. Ting, "The Aims of the Geological Society of China," presented at the First General Meeting of the Geological Society of China, March 2, 1922. *Bulletin of the Geological Society of China* 1, no. 1 (1922), 8.
[225] Roy Chapman Andrews, "China as a Field for Scientific Research," *Bulletin of the Geological Society of China* 1, no. 1 (1922), 8.

briefly on "that most interesting of all Paleontological problems—the origin of the human race." He continued:

> It is pretty generally accepted, for reasons which it is not necessary to enumerate, that Asia is the place of man's origins and the center of his dispersal, and it is quite within the bounds of possibility that China holds somewhere within the limits of its vast area the evidence which will some day elevate certain theories to the position of established facts.[226]

Even before the Americans had truly begun their fieldwork to hunt for humanity's ancestors in the Gobi hinterlands, intriguing reports were already circulating in the Chinese scientific community about possible findings of a collection of prehistoric human bones. James Wong, who had recently been hired by Andrews and Granger as an assistant paleontologist and interpreter, had gone to Manchuria in the company of Swedish paleontologist J. Gunnar Andersson and two trained collectors, identified only as Yao and Pai, to learn their methods of locating promising sites and excavating fossilized material.[227] Almost immediately, the cave system the group was exploring proved to be "exceedingly interesting," containing a number of small mammal bones and, upon further excavation, a large collection of human bones, fragments of painted vessels, and fragments of objects made from stone and repurposed bone.[228] The material was "certainly Neolithic, probably 10,000 or 12,000 years old," and was probably the first such discovery of Neolithic human remains and cultural products found so far in China. The anatomical investigations had been carried out by Andersson and his colleague from the Peking Union Medical College, Davidson Black, who had determined the number of human bones and

[226] Walter Granger, "The Wider Significance of Paleontological Research in China," *Bulletin of the Geological Society of China* 1, no. 1 (1922), 8-9.
[227] J. Gunnar Andersson, *Children of the Yellow Earth: Studies in Prehistoric China*, trans. Dr. E. Classen (London: Kegan Paul, Trench, Turner & Co., 1934), 189.
[228] See both Andrews to Osborn, July 2, 1921; and Andersson, 190-192.

the patterns of damage on them suggested that the people who had lived in the caves had been cannibalistic.

Andrews was nearly sick with envy: "I would have given *anything*, if Wong had been working independently!! Well, I keep my optimism in China as in New York and we'll dig up something ourselves next time!"[229] He wrote to George Sherwood a week later:

> Also please be particularly careful that no news of the cave which Andersson found gets into print anywhere. It is an *extremely important* find and they are keeping it absolutely secret until the material has been studied. What wouldn't I have given to have had our Exp. find it!!![230]

Osborn was fairly sanguine about Andersson, Pai, Wong, and Yao's co-discovery of the Neolithic cave site, writing, "The division of territory is about what we should have expected…" and reiterating to Andrews the high importance of inspecting all the caves he encountered on the trip.[231] Peter Kjærgaard has pointed out that the Americans were granted access to subjectively the worst fossil-hunting region, attributing this to their lack of political *nous*.[232] At the same time, Osborn and Andrews were clearly interested in the Gobi region in particular, with both their personal and scientific or other professional writing from before 1929 emphasizing how strongly they believed they were on the correct track. Given how strenuously both men complained when they felt they were being treated unfairly by Chinese diplomats and government officials, it seems that both Osborn and Andrews were mostly satisfied with the disposition of dig sites, given that they could not personally excavate every site of potential paleontological interest in the Republic of China.

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[229] Andrews to Osborn, July 2, 1921. (AMNH CA 1077.1, 252.)
[230] Andrews to Sherwood, July 14, 1921. (CA 1077.1, 252.) The exclamation points are in the original.
[231] Osborn to Andrews, September 28, 1921. (CA 1077.1, 252.) Letter is written in response to Andrews' of July 2nd.
[232] Peter C. Kjærgaard, "The Missing Links Expeditions—Or How the Peking Man Was Not Found," *Endeavour* 36, no. 3 (2012), 102.

Granger and Andrews considered putting off the beginning of formal exploration in Mongolia in 1922 just so Granger and Wong could continue to explore caves around Szechuan province, but ultimately decided the Mongolia work was more important. Instead, Andrews gathered reports by letters from European and American missionaries about promising cave locales, and began drawing up plans with Wong to have him investigate independently at a later point.[233]

Andrews and the other expedition members embarked for Mongolia in the spring of 1922. Their first complete season of exploration produced promising results: in an article in September 1922, Osborn relayed news of their excavations at a dig in southern Mongolia where fossil-bearing strata appeared to succeed each other in just the way that the dispersion theory would suggest.[234] The dinosaurs bore "an unmistakable resemblance to those found in the Rocky Mountain region of Wyoming," suggesting to Osborn that they must be related, and must have migrated from a Central Asian dispersion point into North America.[235] Andrews was confident that they were the first such fossils from the Cretaceous period to be found in eastern Asia – an excellent note on which to conclude their first year in the field.[236]

For the next year's excavations, Osborn himself joined the AMNH workers in China in August 1923, where he enjoyed riding in motorcars and doing some shooting with Andrews and the other researchers before returning to Beijing. More comfortable in the whirl of diplomatic and scientific high society than in the dust of the Gobi, he gave a small number of public

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[233] Andrews to Osborn, March 2, 1922. (CA 1077.1b, 252). Andersson also made use of an informal missionary network to gather information on interesting paleontological and geological phenomena in the Chinese interior.
[234] Henry Fairfield Osborn, "Proving Asia the Mother of Continents," *Asia* 22, no. 9 (September 1922), 721.
[235] Osborn, "Proving Asia the Mother of Continents," 724.
[236] Andrews to Osborn, May 9, 1922. (CA 1077.1, 252). See also Osborn to Andrews in reply, June 8, 1922.

addresses on the many scientific triumphs of the Third Asiatic Expedition, and their growing certainty that the "missing link" would be appearing in their fossil collections soon.[237] Returning to Beijing in late September, Andrews sent a telegram to the AMNH home offices in New York summarizing the 1923 season:

> 26 men, 5 cars, safe well, 3000 miles Mongolia, 9 tons fossils. Central and Eastern Gobi Desert 7 life zones early age of reptiles to middle age of mammals. Western Gobi 70 skulls 10 skeletons primitive horned ceratopsian dinosaurs…three nests 25 dinosaur eggs. First ever discovered. Eastern Gobi 3 quarries many lowland duckbill dinosaurs…explored 4 life zones Eocene, two Upper Oligocene with relationship to American, Western European, and American Rocky Mountain life zones. **This substantiates central Asiatic dispersal and land bridge theory**.[238]

Their haul of richly varied fossil life was so substantial that several members of the expedition's scientific staff returned to the United States during the winter of 1923 to get a head start on classifying and analyzing the different finds. The collection that arrived at the museum in the fall of 1923 consisted of over 1800 zoological specimens; a fossilized skull of an enormous *Baluchitherium*, an extinct type of hornless rhinoceros; over seventy skulls and twelve complete dinosaur skeletons; and the first collection of fossilized dinosaur eggs ever discovered.[239] The only thing missing was evidence of the evolutionary history of humans; otherwise the expedition was, by virtually any measure, a stunning success.

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[237] "Americans Find 'Garden of Eden' in Far Mongolia," *Chicago Daily Tribune*, September 25, 1923. (CA 1077.1, 252).
[238] Cablegram, Roy C. Andrews to AMNH, September 24, 1923. (CA 1077.1, 252). Emphasis mine.
[239] Roy C. Andrews, "Report of the Department of Mammals," AMNH Annual Report for the year 1923 (AR #55), 118-120. See also W.D. Matthew, "Report of the Department of Extinct Vertebrates," AR #55 (1923), 87-88.

Exploring at Speed

Getting somebody to pay for this material was a lot of work. The AMNH expedition leveraged its institutional visibility, as well as the social connections that Osborn enjoyed with members of the New York political and financial elite, to generate revenue. They also entered an unorthodox partnership with a private magazine. The result was that the Central Asiatic Expedition was able to raise research funding that dwarfed the budgets of comparable scientific expeditions working in the same region on similar problems.

When the Third Asiatic Expedition was announced in 1920, supporters from around the United States contributed $107,491.50 to cover the costs for the first five years.[240] Osborn also forged links with the American Asiatic Association and their magazine *Asia: The American Magazine on the Orient*. The magazine agreed to contribute matching funds to the money raised by AMNH in exchange for the rights for a series of commissioned articles on their research, written by members of the expedition; exclusive first access to all photographs taken by the expedition; and exclusive distribution and sale rights to any motion picture footage produced by the expedition.[241] In many ways, this agreement resembles the scientist-journalist partnerships forged between *National Geographic* and primatologists and paleoanthropologists in the 1960s, which played an important role in introducing the American public to the work of people like Jane Goodall and Louis Leakey, and the use of striking cinematography played an important role in making their scientific work accessible to large audiences, and very memorable.[242]

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[240] AMNH Annual Report for the year 1920 (AR #52), 27-28; and George Sherwood, "Memorandum concerning the Third Asiatic Expedition of the American Museum of Natural History," May 22, 1924. (CA 1077.2, 253).

[241] "Agreement between Asia Magazine Inc. and the American Museum of Natural History for the Organization and Support of the Third Asiatic Expedition." (CA 1077.2, 253). The agreement was finally signed January 12, 1923 but held to have been in effect since March 1, 1921.

[242] Donna Haraway, *Primate Visions* (New York: Routledge, 1989), especially "Apes in Eden, Apes in Space: Mothering as a Scientist for National Geographic," 135-185.

The magazine's contributions to the overall cost of the expedition ultimately ran to $33,479.28, only slightly less than the museum's contributions from its own funds of $36,072.00, although the press coverage and publicity certainly helped raise funds from readers who simply sent money directly to the AMNH.[243] Not everyone, though, was delighted by the museum's innovations in public-private partnership. Because the museum was at least partly funded by the City of New York, the borough president for Manhattan, Julius Miller, objected to the news monopoly granted to *Asia*, arguing that it was inappropriate to give a private entity exclusive preferential access to scientific materials that had been produced with public funds.[244] Osborn and museum executive secretary George Sherwood moved quickly to counter the criticisms, showing that the city funds were exclusively used for supporting building maintenance and the museum's long-running educational programs for New York schoolchildren, and that the funding for the Third Asiatic Expedition was completely separate from other museum accounts for just this reason. Inside the AMNH, there was speculation that the *New York Times*, which published the articles alleging financial malfeasance, was in fact retaliating after Andrews had turned down a request from the paper's managing editor for exclusive information on the expeditions.[245] The public-private partnership was saved, for the time being, but the contract with *Asia* was not renewed when the expedition was extended a further five years, in part because of the controversy.

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[243] George Sherwood, "Memorandum concerning the Third Asiatic Expedition of the American Museum of Natural History," May 22, 1924. (CA 1077.7d, box 253).
[244] "Charges Museum Favors Magazine: Borough President Miller Objects to 'Asia's' News Monopoly of Andrews Expedition," *The New York Times*, April 12, 1924; and "Museum in Error, Miller Declares: Borough President Credits Natural History Officials with 'Best Motives,'" *The New York Times*, April 15, 1924. (CA 1077.7d, box 253).
[245] Andrews to Osborn, April 15, 1924. (CA 1077.7d, box 253).

The publicity and direct financial support from *Asia* helped make the work of the Third Asiatic Expedition a reality, but the relationship was mutually beneficial. The beautiful photographs of the Mongolian countryside and rousing tales of scientific adventure made for excellent magazine copy, and Andrews delivered material ahead of deadlines; Osborn, burdened by both administrative duties and ego, required closer management.[246] Andrews' yen for speed and modern technology functioned symbiotically with the interests of the magazine's parent organization. As a publication of the American Asiatic Association, *Asia* worked to further the organization's interests, which revolved around the expansion and promotion of American business interests in East Asia, and especially in China.[247] The sponsorship of exciting, modern, and high-tech scientific adventure, beautifully illustrated with both photographs and motion pictures designed for theatrical release, fit neatly into the narrative of American power in Asia that both *Asia* and Andrews wanted to project.[248]

In Andrews' first book about Mongolia, written about a previous, much briefer trip in 1919 to hunt wild game, he reflected on the possibilities that the country offered for technical development and American capital investment: "Every year the Far East is becoming increasingly important to the Western World, and especially to the people of the United States, for China and its dependencies is the logical place for the investment of American capital. It is the last great undeveloped field, and I am interested in seeing the American business man

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[246] Louis Froelick to Henry Fairfield Osborn, July 7, 1922. (CA 1077.2-1077.7, box 253).
[247] James J. Lorence, *Organized Business and the Myth of the China Market: The American Asiatic Association, 1898-1937* (Philadelphia: Transactions of the American Philosophical Society, 1981), 75-76; and Matthew Frye Jacobson, *Barbarian Virtues: The United States Encounters Foreign Peoples at Home and Abroad, 1876-1917* (New York: Hill and Wang, 2000).
[248] These elements are especially obvious in the profile *Asia* published on Roy Chapman Andrews in 1924. Louis D. Froelick, "Andrews of Mongolia: A Look Behind the Scenes into the Business of Exploring," *Asia* 24 no. 8 (August 1924), 638-640. See also Kjærgaard, "The Missing Links Expeditions," 97-105.

appreciate the great opportunities which await him in the Orient."[249] He returned to these themes repeatedly in his articles about the expedition and its work, although he added the possibility of air transportation to his technological imaginary.

Andrews was also a boon to *Asia*'s advertising department, since he often described the different modern technologies that he and other members of the expedition were using in the field, as a part of his self-fashioning as a prophet of modern methods of exploring.[250] The expedition traveled across the desert in a convoy of new motor cars and trucks, although with the gasoline carried separately in a caravan of camels, wrote letters and scientific reports on typewriters, filmed motion pictures of exciting moments of action, such as the simultaneous arrival of the motorized caravan and the camel caravan at Turin, Mongolia, and experimented with color photography, and worked hard to keep their wireless system in good working condition.[251] Many of these items were identified by brand name, and were even provided to Andrews by private companies, with Dodge, for example, supplying the vehicles for the expedition's desert treks. One article in 1922 concluded by describing new expedition member J.B. Shackelford, who was brought on board to handle all the field cinematography, and ran on the same page as an advertisement for home motion-picture cameras.[252] The March 1924 issue of

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[249] Roy Chapman Andrews, *Across Mongolian Plains: A Naturalist's Account of China's 'Great Northwest'* (New York: D. Appleton and Company, 1921), 175.

[250] This self-conception became even more important towards the end of Andrews' career, when he took pains to delineate how technology enabled *better* exploration, and that using motorcars or airplanes to get to remote locations and move between field sites did not make expeditions "too easy." Roy Chapman Andrews, *This Business of Exploring* (New York: G.P. Putnam's Sons, 1935).

[251] See Andrews to Osborn, May 9, 1922. (CA 1077.1, 252); on the topic of the wireless set, see Andrews to George Sherwood, March 17, 1923 (CA 1077.1, 252), which is very goofy and affectionate, and concludes with the line "Am sending you a cocktail by letter, is that 'bootlegging?'" Sherwood was the acting director and executive secretary of AMNH, and he and Andrews had a friendly relationship; Andrews always addressed his letters to Sherwood by the nickname "Sammie," while Osborn was always "President Osborn," or "Professor."

[252] Roy Chapman Andrews, "Politics and Paleontology," *Asia* 22, no. 5 (May 1922), 360-364, 400-401. The camera advertisement is on page 401.

Asia didn't even carry a story from the expedition's members. It just ran a full-page advertisement for Corona typewriters, in the form of a letter from Roy Chapman Andrews himself, writing to thank the company for their superior product, which had been field-tested by Andrews against the "terrible dust storms of China."[253]

By the time of the typewriter advertisement, it had become clear to Osborn, Andrews, and the other members of the expedition that they were unlikely to secure their sought-after "missing link" without more time in the field. Fortunately, initial indications suggested there was enough public interest to secure funding for several further years of exploration. In January 1924, Andrews addressed a fundraising appeal to the members of the American Museum of Natural History: "You have read and heard so much about the results of the Third Asiatic Expedition that it is needless for me to describe them in detail."[254] With a characteristic sense for public relations, Andrews extolled the discovery of the "richest and most extensive fossil deposits of the entire world," and the important work the expedition's personnel were performing by creating an accurate, up-to-date map of the Mongolian frontier.

The work of the expedition had already been so promising, Andrews wrote, that it was clear at least a further five years of work would be necessary, and with "the machinery of a great expedition working smoothly," it would never be easier to undertake the work planned. Lastly, the successful continuation of the expedition was a matter of national pride and national advancement: "We are carrying American ideals, American science, and the American flag into one of the least known countries of the world. We are bringing back the fruits for the entire American people." With the conclusion of the originally planned work of the Third Asiatic Expedition in the 1924 season, the museum began using the name "Central Asiatic Expedition"

[253] See typewriter advertisement in *Asia* (March 1924), 239.
[254] Andrews to AMNH Members, January 10, 1924. (CA 1077.0, 251).

to refer to the proposed five-year extension of the original expedition plan, and then gradually came to use the name "Central Asiatic Expeditions" to refer to the entire set of zoological, geological, and paleontological researches performed under Andrews' leadership in and around China since 1916.[255]

Finding Funds

The AMNH was not the only foreign expedition working in China. Looking closely at a French expedition to China in 1923-1924, sponsored by the Muséum nationale d'histoire naturelle (MNHN), provides a point of comparison that makes it clear just how unusual the AMNH expeditions were in both their style and their scale. Although the Chinese Geological Survey hired several foreign scientists in the 1920s, its work was not exclusively directed towards researching human origins, and the Survey occupied a different position in both the domestic and international intellectual and political spheres.

In his 1935 book *This Business of Exploring* – half how-to guide to modern exploration, half travelogue of the latter years of the Central Asiatic Expeditions – Roy Chapman Andrews laid out some important advice for would-be explorers:

> Finances are the *bête noire* of every explorer. How to raise the money? Unless you have the personality and ability to sell yourself as well as your plan you are just out of luck. Enthusiasm is a *sine qua non*. You can't make some one else believe in your project unless you believe in it passionately yourself.[256]

[255] The early trips had been much smaller affairs: one expedition to Yunnan province, in southeastern China, to collect mammals and birds in 1916-1917, and a second zoological expedition in 1919-1920 to the Gobi region in Mongolia and northern China, chronicled in Andrew's travelogue *Across Mongolian Plains*.
[256] Andrews, *This Business of Exploring*, 14.

Andrews related this advice in the context of an anecdote about an encouraging conversation he had once had with the famous financier J.P. Morgan, who was in the process of giving Andrews a very large sum of money. For researchers possessed of equally passionate belief but fewer Wall Street connections, raising money for equivalent expeditions in China was very difficult. Andrews also benefitted from being based in an American institution, and from doing much of his fundraising work in one of the few western countries whose economy had not been devastated by the First World War. For researchers like the French Jesuit paleontologist Pierre Teilhard de Chardin, who also went to China to search for the remnants of prehistoric hominins in 1923, accumulating the funds for his work was much more difficult.

Arriving in China in the spring of 1923, Teilhard de Chardin met with his compatriot and fellow Jesuit Émile Licent in Tianjin, where Licent served as the director of the Musée Hoangho Paiho (today the Tianjin Natural History Museum), and began planning their expeditions into the Chinese interior for the summer and fall of 1923. They focused on the Ordos region, characterized by rolling hills and deep layers of distinctive yellowish-grey loess, located between the Yellow River to the south and the Gobi to the north, looking for fossilized human remains, stone tools, or cave art produced by prehistoric humans. Over the course of 1923 and 1924, Licent and Teilhard conducted thorough stratigraphic analysis of the loess deposits, analyzed the role of glaciation in the formation of the topography, and collected evidence suggesting that a stone tool-making culture had existed in the region during the Paleolithic period.[257] The various tools, which came in forms of choppers, scrapers, and simple awls, were analogous to Mousterian stone tools discovered in France, and were taken to France for analysis by another

[257] Marcellin Boule, "Introduction," in M. Boule, H. Breuil, E. Licent, and P. Teilhard, *Le Paléolithique de la Chine*. Archives de L'Institut de Paléontologie Humaine, Mémoire 4. (Paris: Masson et Cie, 1928), vii. All translations from French by EMK.

colleague of Boule's and former teacher of Teilhard's, the noted prehistorian Henri Breuil.[258] Despite their best efforts, however, Licent and Teilhard discovered no fossil skeletons of Paleolithic humans in the Ordos. The investigations of the French expedition were published in the *Mémoires of the Institut de Paléontologie Humaine* in 1928 with an extensive introduction by Boule, which referenced the "excellent results of the American paleontological expeditions effected in Mongolia in recent years," which had provided interesting proof in support of the theoretical position favoring an Asian center of mammalian diffusion.[259]

Between field seasons, Teilhard passed his time in Beijing. News of the AMNH expedition's successes in the 1923 season were omnipresent, a situation he found deeply annoying. In October, Teilhard wrote to his mentor, Marcellin Boule, that the newspapers were full of news on an address that Osborn had recently delivered – "perhaps a little grandiloquent, [and] all about the ancient Man that he has *not* found in the Gobi."[260] Despite this, the Americans were "not disappointed," their good humor and optimism buffered by their victories on the fossil mammal front and by their discoveries, already mentioned, of a nest of dinosaur eggs, "'served up on a plate,' following the popular expression," as Teilhard put it.[261] In another letter to Boule the following month, he remarked "It is quite good, from the French point of view, that Licent and I have arrived at results of a comparable, if not equal, importance to those obtained by Osborn."[262]

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[258] Teilhard returned to France in the fall of 1924 with forty-nine cases of artifacts and geological samples. Teilhard de Chardin to Boule, September 11, 1924, in Amélie Vialet and Arnaud Hurel, eds. *Teilhard de Chardin en Chine: Correspondence inédite (1923-1940)* (Aix-en-Provence: Édisud, 2004), 134.
[259] Marcellin Boule, "Introduction," in Boule et al., *Le Paléolithique de la Chine*, i-ii.
[260] Teilhard de Chardin to Boule, October 16, 1923, in Vialet and Hurel, 79.
[261] Teilhard de Chardin to Boule, October 16, 1923: "… leurs œufs de Dinosauriens (dont « il font un plat » suivant l'expression populaire…"
[262] Teilhard de Chardin to Boule, November 21, 1923. Vialet and Hurel, 84.

To participate fully, though, it was necessary to have sufficient research money, and Teilhard and Licent were concerned by their rapidly diminishing funding as they began to plan for 1924. Over the latter half of 1923, the value of the franc had plummeted on the world market, losing about a third of its value against the Chinese silver dollar, the primary currency of exchange for purchasing services and supplies for a paleontological expedition.[263] Teilhard had arrived in China with research funding totaling 41,700 francs, contributed by the Muséum nationale d'histoire naturelle, the Institut de paléontologie humaine, and the French ministry of public education.[264] Expedition expenses for the year 1923 came to 2738 Chinese silver dollars, or 27,380 francs at the January 1924 conversion rate, leaving only 14,320 francs, or 1,432 silver dollars for the second half of the proposed research program. In a year where Roy Chapman Andrews and the AMNH group had spent more than $50,000 US dollars to equip and run their fieldwork, Teilhard and Licent made do with just under $2000. The amount of fluctuation and instability in the currency systems and economies of both the Chinese and French republics in the early 1920s makes across the board comparisons to other currencies difficult, although not impossible. The fluctuation of the franc exchange rate was the subject of a US Senate inquiry in 1925, and the inquiry's report included month by month tracking of the franc-US dollar exchange rate across a fourteen-year period.[265] The impact of the war on the world economy was

[263] Teilhard de Chardin to Boule, January 20, 1924. Vialet and Hurel, 99. In the preceding year, the franc had lost value against the Chinese silver dollar, going from 7fr. to the dollar to 11fr./dollar (although 10fr./dollar if Teilhard went through a black-market connection attached to the Tianjin mission). When Teilhard de Chardin arrived in Tianjin in the spring of 1923, his research accounts were equivalent to about 5957 Chinese dollars; depreciation alone cut the value of his funds to 4170 Chinese dollars by the start of 1924. "C'est la faute du franc," he wrote to Boule.
[264] "Etat des fonds de la mission Teilhard, le 20 janvier 1924," in Vialet and Hurel, 100.
[265] See Table 33, "France – Exchange rates 1911-1925," in John Parke Young, Senate Commission of Gold and Silver Inquiry, "European Currency and Finance, Foreign Currency and Exchange Investigation." Serial No. 9, vol. 1. (Washington DC: Government Printing Office, January 12, 1925), 476.

felt by American institutions as well – Osborn wrote to a colleague that museum expenses in New York had increased 120% compared to 1914, and that other institutions were similarly affected – but the volatility of the franc was particularly troublesome.[266]

During a conversation in Beijing in August 1924, Teilhard assured Andrews that the American expedition was more than welcome to explore the territory once Teilhard had finished his own work, but conveyed his concern that his colleague Licent and his former teacher and current scientific sponsor, French paleontologist Marcellin Boule, would "resent it strongly" if Andrews and his group were to even visit their sites before the initial researches had been published.[267] Andrews interpreted this as a gracious gesture on Teilhard's part, and genially reassured him that the Americans had no intention of trespassing on the French field research sites.[268] Teilhard, describing the encounter to Marcellin Boule shortly thereafter, wrote that Andrews was "a charming boy, much more agreeable than his bluff literary persona would make him seem," although certainly no *savant*. More astonishing, to Teilhard, was the news that the Americans had already raised "380 000 gold-dollars!" for the continuation of their expeditions for a further five years.[269] The account of both the fundraising achievements and the litany of interesting mammalian fossils the Americans had uncovered left Teilhard tremendously jealous. There was little chance of competing against the Americans in terms of scientific fame and research scope, given the disparity of resources.

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[266] HF Osborn to DMS Watson, 19 October 1925. NCUACS 42.4.93/B.5 USA, D.M.S. Watson papers, UCL Special Collections.
[267] Andrews to Osborn, August 6, 1924. (CA 1077.1j, 252.)
[268] Teilhard de Chardin to Boule, August 4, 1924, in Vialet and Hurel, 132-133.
[269] Teilhard de Chardin to Boule, August 4, 1924. Teilhard's "gold-dollars" are probably US dollars; the numbers seem about right based on AMNH fundraising figures for the second round of the Central Asiatic Expeditions.

Superficially, the French and American expeditions showed some broad similarities. They were both sponsored by a national natural history museum (or a natural history museum with a national reputation in their home countries, since the American analogue of the MNHN would more properly be the Smithsonian). They were interested in similar questions, were aware of each other's work, and were operating in similar institutional spaces in relation to the Chinese scientific establishment and the Republican government. However, the financial resources of the Americans put them in a category of their own. Where the French expedition went into the field with two researchers and ten support staff, the Americans went out in groups of sixty or more. AMNH had a small fleet of Dodge motor cars, while Teilhard worried over the negotiations to buy a handful of mules. With Osborn and Andrews' shared gifts for publicity and self-promotion, news of the American expedition dominated the Beijing scientific scene and frequently garnered reference in the local and international press. If the Central Asiatic Expeditions were the future of exploration, then it was going to be difficult for expeditions like Teilhard's to operate effectively without much deeper pockets.

Decline and Fall

With an influx of new funding and continued permission to excavate in China, Andrews began to make plans for a program of excavations that would occupy the AMNH group through to 1930. The outbreak of civil conflict in northern China, especially in provinces that lay on the most direct route between Ulaanbaatar (then Urga) and Beijing, limited field access.

With a more open-ended expedition timeline, Osborn and Andrews needed to continually find new ways to support further work. One of the dinosaur eggs unearthed in 1923 was auctioned to Colgate University for the princely sum of $5,000, much to Osborn's delight. The

discovery of the dinosaur eggs had generated an international furor, one now matched by the response to the high sale price, especially since it was not entirely clear that the AMNH officials had the right to sell the dinosaur egg at all. The dinosaur eggs had been excavated in Mongolia, which was at the time in the middle of Bolshevik revolution, and ongoing political infighting among different factions in the Mongolian Bolshevik government resulted in a complete ban on all scientific exploration in the country. The AMNH expedition was able to leverage personal connections with explorer Tsokto Badmazhapov (spelled Badmajapoff in AMNH records), who had become an advisor to the new Mongolian government, and get themselves grandfathered in as an exception.[270] They still had to field significant criticism from the new Mongolian minister of education, who accused Andrews and the other expedition members of robbing the Mongolian people of priceless national – and natural – patrimony. [271] An arrangement was ultimately reached to allow the Americans to continue to export zoological and fossil specimens, provided that any duplicates were deposited with the Mongolian government for a future natural history museum in Ulaanbaatar. Going forward, however, the increased violence and instability in the surrounding region, and the expedition's willingness to bend rules to better suit their needs, made future engagements with the Mongolian government and military much more fraught.

Before the expedition began, in 1920, members of the American legation (the diplomatic office one level below an embassy) helped arrange import permits and travel permissions within the country for the AMNH expedition members, and provided introductions to the Chinese Foreign Ministry.[272] Nonetheless, certain details appear to have been left unspecified, with

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[270] AMNH Annual Report #56 (1924): 9-10. On Badmazhapov, see Imre Galambos, *Translating Chinese Tradition and Teaching Tangut Culture: Manuscripts and Printed Books from Khara-Koto* (Berlin: De Gruyter, 2015), 29-37.
[271] Andrews to Osborn, October 1, 1924. (CA 1077.1j, 252). The sale of the Mongolian dinosaur egg for $5000.00 was a particular sticking point.
[272] AMNH Annual Report for the year 1920 (AR #52), 45-47.

Andrews and Osborn assuming American scientific and commercial might would simply resolve any conflicts in their favor. One early issue related to the ability of the AMNH expedition to export its finds from China without submitting to customs inspection or paying export duties. Andrews and the American legation felt it was obvious that scientific material should not be subject to the same regulations as commercial exports; the Chinese government strongly disagreed.[273] An unspecified compromise was eventually reached, and there the matter remained, until 1926, when the AMNH expedition members were again found to be in violation of treaties covering the export of scientific specimens, and also found to have continued to refuse to pay the requisite excise duties. [274]

After a productive field season in 1925, civil war in northern China had closed the Chinese-Mongolian border, preventing the expedition from reaching the fossil fields, and disrupting movement around the whole of China; after much deliberation, Andrews decided to cancel fieldwork for the year 1926.[275] With no chance of getting into the field, he committed to spending the expedition's off-season instead giving lectures on the expedition's work, usually while also showing film strips recorded during the first few seasons of Mongolian work. Every canceled season ate up funds while personnel, vehicles, and animals sat in Beijing and waited.

Still, the enforced delay freed up Andrews to embark on an ambitious international lecture tour, and honoraria from these kinds of engagements added substantially to the expedition's coffers: Andrews estimated that that his total payments from speaking engagements

[273] Andrews to Osborn, April 29, 1923. (CA 1077.1, 252).
[274] "Translation of Memorandum from the Ministry of Foreign Affairs, Peking, to the American Legation," November 3, 1926. (CA 1214.1, 597).
[275] See W.D. Matthew to Osborn, April 14, 1926. (CA 1214.1, 597); E.F. Stanton to J.V.A. MacMurray, American Minister to China, May 17, 1926 (CA 1214.1, 597); Andrews to Osborn, May 18, 1926. (CA 1214.1, 601).

in the winter of 1926 amounted to about $50,000.[276] In the beginning of November 1926, Andrews gave two lectures in London, delivering the 1926 Asia Lecture at the Royal Geographic Society and then speaking at the Central Asian Society the following week.[277] Andrews' British audiences were impressed by the scope and technological sophistication of his expeditions, and honed in on a key feature in Andrews' successes: his ability to fundraise.

Speaking for the British Museum during the post-lecture question and answer session, Dr. Francis Arthur Bather remarked that "while we are a national institution…we have to follow, and to follow a very long way behind, the Museum of New York, the American Museum of Natural History, because they have the art of getting money, and we have not."[278] Andrews hit on a symbiotic relationship between exploration, technology, and money: gasoline and spare parts for his fleet of expedition motor cars were expensive, but they allowed him to move at about ten times the rate of an expedition run with camels. The methodological innovations were fodder for further speaking engagements, which filled the treasury and paid for the gasoline and vehicles in the first place. Even beyond the excitement of technology and new methods in exploring, though, the chief appeal of Andrews' lectures and the continuing work of the expedition itself was the quest for the ancestors of modern humans. Again and again in the titles of his lectures, or in the headlines of newspaper articles about the expedition, the same words were repeated: Roy Chapman Andrews and the AMNH were on the hunt for "bones of primeval Man."[279]

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[276] In 2017 dollars, this would be equivalent to about $690,000.
[277] Roy Chapman Andrews, "On the Trail of Ancient Man in Central Asia," *Journal of the Royal Central Asian Society* 14, no. 1 (1927), 43-61. Both institutions still exist; the Royal Central Asian Society is now the Royal Society for Asian Affairs. The speech at the RGS seems to have been on November 1; the Central Asian Society talk was on November 10.
[278] Andrews, "On the Trail of Ancient Man in Central Asia," 58.
[279] "New Asiatic Expedition Will Seek Bones of Primeval Man," *The Sun*, May 7, 1924. (CA 1077.0, 251); and "Andrews Begins Asian Hunt for Primitive Man," *New York Herald-Tribune*, May 26, 1924. (CA 1077.1, 252).

The political situation had only deteriorated by 1927, and again the expedition was forced to cancel their plans. Andrews focused on downsizing the expedition's capital equipment by selling ninety-seven camels to explorer Sven Hedin, who planned to head west, away from the center of the fighting, and offering the motorcar fleet to the American Legation, and dismissing the majority of the Chinese fossil technicians and field assistants.[280] Hedin and the camels completed what one biographer categorized in 1954 as "the last great exploratory expedition in the classic style," trekking from Baotou to Xinjiang in north-western China.[281] The purpose of the trek, though, was to scout locations for Deutsche Lufthansa, which was interested in establishing airplane routes from China to Europe. Andrews' hoped-for technological revolution for inland Asian transportation was beginning to take shape.

The Central Asiatic Expedition finally returned to the field in April 1928, and completed a remarkable season of collecting, shipping ninety crates of fossils back to New York at the end of the summer, although again without any human fossils.[282] The continuing failure to find the evolutionary ancestors of humankind pressed heavily on Osborn, back in New York. In his annual report for 1928, the rhetoric of the expeditions underwent a pronounced shift: the chief achievement of the Central Asiatic Expeditions now consisted of its services to mapping and cataloguing the vast reaches of Inner Mongolia, and describing new geological formations and fossil deposits.[283] Still, he held on to hope that a few more seasons of excavation could produce the fossilized remains of an actual human ancestor. When the expedition went to ship their finds home at the end of the expedition, however, their collection crates were seized by the Chinese

[280] Andrews to Osborn, June 8, 1927. (CA 1214.1, 597).
[281] Gösta Montell, "Sven Hedin the Explorer," *Geografiska Annaler* 36, no. 1/2 (1954), 6.
[282] Andrews to Sherwood, April 8, 1928. (CA 1214.1, 598). Andrews *did* accidentally shoot himself in the leg during this season of fieldwork, but recovered.
[283] AMNH AR #60 (1928), 18.

government, leading to months of tense international negotiations.[284] Andrews and the AMNH expedition were accused of antiquities theft, both man-made artifacts and specimens from the natural world – similar charges to those made by the Mongolian government in 1924. They were found to be in violation of a new set of regulations, which required foreign scientific expeditions to include Chinese nationals in the expedition's leadership structure, and to make provisions that the fossils collected, including unique specimens, would remain in China for cataloguing and study.[285] They were also accused of illicitly prospecting oil, gas, and mineral deposits for foreign companies – geological espionage.

The landscape of the Gobi where the expedition had concentrated their research efforts was generally poor in mineral wealth. An AMNH geological survey, performed by Charles Berkey and Frederick Morris during the 1922-1923 field seasons, identified only an abundance of quartz, a few beds of low-quality coal, and a small number of iron-bearing rock formations, although again of low quality and abundance.[286] Prospecting for oil and minerals does not seem to have been an object of particular interest for Andrews, Walter Granger, Charles Berkey, Frederick Morris, or any of the other geologically aware members of the group, at least to the extent that these interests might be expected to appear in their notes and correspondence. Still, *Asia* magazine reported in 1924 that the expedition's fleet of motorcars was sponsored by Standard Oil, who had donated the gasoline, who certainly would have benefited from any

[284] See Osborn to Stimson, May 9, 1929; Sherwood to Andrews, May 14, 1929; Andrews to Osborn, May 21, 1929; and Andrews to Osborn, June 26, 1929. (CA 1214.1, 598).
[285] Tchang Ki (Chairman, Committee for the Preservation of Ancient Objects) to Osborn, April 19, 1929. (CA 1214.1, 598). Ironically, the American Museum of Natural History had played a large role in the creation of the first regulations against the export of Chinese antiquities set up after the fall of the Qing in 1911; see CA 1003, 233, letters from 1914-1919. Osborn was one of the key signatories to the official petition.
[286] Charles P. Berkey and Frederick K. Morris, *Geology of Mongolia: A Reconnaissance Report Based on the Investigations of the Years 1922-1923*, Natural History of Central Asia, Vol. II. (New York: The American Museum of Natural History, 1927), 60, 89, 263.

American resource prospecting, had any tempting deposits been discovered.[287] As Andrews pointed out in his 1935 book, their work had been carried out in cooperation with several Chinese scientific bodies, including the Geological Survey, and every discovery the Americans made had been "spread on the pages of almost every newspaper in the world."[288] Given their knack for publicity, it does seem unlikely that the AMNH group would have discovered fabulous mineral or oil deposits, and then kept the information to themselves. There is no evidence that any under the table prospecting actually occurred, but the accusations added to the general opprobrium that was leveled at the American expedition in 1928.

Repeated appeals to the US Department of State failed to produce the desired result, of complete freedom of movement and expropriation for the expedition, and in June 1929, Andrews sourly wrote to Osborn, "The expedition seems destined to an unnatural death."[289] He was ultimately able to eke out one more year of fieldwork in Mongolia in 1930, but it was clear that the expedition's time was almost up. Although Osborn placed most of the blame on the intransigence of the Chinese government, it was also apparent that the Museum's budget for lengthy long-distance expeditions was running low. Every delayed or canceled season sucked up the expedition's funds; Andrews warned the Museum trustees that he would need an additional $60,000 to make up for the lost 1926 season, although he added that over $15,800 had already been subscribed from private donors.[290] The expedition was essentially out of money by 1930, and the increasing economic turmoil occasioned by the US stock market crash in 1929 had

[287] Standard Oil agreed to donate all the oil and gasoline the expedition would need for the excavation season of 1923; Andrews estimated this saved the expedition about $3,000. Andrews to Osborn, February 9, 1923. (CA 1077.1, 252).
[288] Andrews, *This Business of Exploring,* 236-237.
[289] Andrews to Osborn, June 26, 1929. (CA 1214.1, 598).
[290] AMNH AR#58 (1926): 90-92.

further reduced the museum's capacity to fundraise, not to mention many of the trustees' ability to pay.

In the annual report for 1932, where Osborn issued his denunciation of the Nationalist government and his eulogy for the cause of international science, the primary narrative was the necessity of fundraising and belt-tightening in the face of economic duress; the somewhat unexpected theme Osborn selected for his presidential address was "defeating defeatism."[291] Political conflict certainly shortened the lifespan of the expedition, and perhaps sent it into a premature decline, but the funds were only meant to last a few years anyway; the onset of the Great Depression severely damaged the model of private donation that Osborn had cultivated to fund the expedition's work.[292]

The summer of 1930, the last season of fieldwork in Mongolia, was tinged with an elegiac air. Andrews and Walter Granger led their group deep into the Gobi Desert badlands, where they eventually found themselves on the edge of a vast basin that had once been a prehistoric lake.[293] The basin's edges proved to hold a rich vein of fossils, mostly ancient mammals that appeared to have gotten stuck in bogs and quicksand when the lake was still a part of a lush ecosystem. They still had yet to find anything resembling a primate, even in the soils of the prehistoric death traps. As Andrews wrote: "Even as early as the Pliocene, several million

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[291] The title was "The American Museum and Defeatism," and the net effect is exactly as peculiar as it sounds. (Previous annual reports had focused on educational outreach, or the plans for the museum building.)

[292] I am indebted to Rainger for this point about Osborn's fundraising methods for AMNH more broadly; the pet status of the Central Asiatic Expeditions make it a particularly good test case for observing these dynamics. See Ronald Rainger, *An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890-1935* (Tuscaloosa: University of Alabama Press, 1991).

[293] See the account in Andrews, *This Business of Exploring*, 245-275. We should consider that this account was published five years after the events being related, and while Andrews was stuck in a bog of his own – a short-lived and rather unsuccessful tenure as the president of the American Museum of Natural History. Even adjusting for the nostalgia, the descriptions of the countryside and the work in 1930 have a particularly lovely tone.

years ago, primitive humans were more intelligent than the animals about them. They probably knew enough to avoid such places. Still, accidents happen."[294]

The lake bed was the most likely spot for discovering primate fossils that Andrews and the others had yet found in their explorations, and now they had no time left to excavate, to slow down and take the time to do a thorough investigation: "That summer we had made a beginning, but only a beginning. Several years of work remain to be done. It was useless for us to undertake a proper systematic exploration, knowing that it could not be completed except under impossible restrictions."[295] All the same, the richness of the many fossil discoveries that Andrews and his team had made over the previous ten years had convinced him completely that the dispersion thesis was correct. The high plateaus of the Gobi were the ancient 'Garden of Eden,' – for dinosaurs, for ancient mammals, and for humankind too.[296]

Dawn Men and SS Men

Between his administrative duties as president of the American Museum of Natural History and his fundraising and promotional efforts on behalf of the Central Asiatic and other museum-sponsored expeditions, Henry Fairfield Osborn found time in 1927 to deliver a series of lectures at Princeton, his alma mater, on his theories of progressive human evolution. Published at the end of the year, Osborn's *Man Rises to Parnassus: Critical Epochs in the Prehistory of Man* was an accessible, fast-paced introduction the study of human paleontology and prehistory

[294] Andrews, *This Business of Exploring*, 245.
[295] Andrews, *This Business of Exploring*, 265.
[296] Andrews, *This Business of Exploring*, 287.

in Europe and Asia, and to Osborn's thesis of progressive, directed evolution, or orthogenesis, as applied to modern humans.[297]

Over the course of the preceding decade, Osborn had become steadily more obsessed with the idea of an as-of-yet undiscovered Central Asian "Dawn Man," – a hardy, intelligent first human set on an ascendant path by a rigorous climate and changing environmental conditions that then mastered tools and fire and had gone on to conquer the rest of the world.[298] Marianne Sommer has described how Osborn's professional envy of the British Museum's Piltdown specimens and desire for real human fossils of his own for the newly-built Hall of the History of Mankind helped motivate his support for Andrews' proposed Central Asian expeditions as early as 1916.[299] Even the term "Dawn Man" came from the binomial designation for the Piltdown specimens, *Eoanthropus dawsoni*, "Dawson's dawn man."

In his sixth and final lecture for *Man Rises to Parnassus*, Osborn addressed two claims that were central to his Dawn Man thesis. The first was that the cradle of mammalian evolution, and thus the homeland of the archetypal Dawn Man, was in Central Asia. The second was that continual challenge was necessary for the human species to continue to progress and evolve; without external stimuli, the species would stagnate and begin to decline. The two main claims were not unrelated: Osborn believed that the arid high altitude plateaus of prehistoric Mongolia had provided the necessary evolutionary stimulus for Dawn Man to emerge: "In brief, *while the anthropoid apes were luxuriating in the forested lowlands of Asia and Europe, the Dawn Men*

[297] Henry Fairfield Osborn, *Man Rises to Parnassus: Critical Epochs in the Prehistory of Man* (Princeton: Princeton University Press, 1927).
[298] Osborn's embrace of the Dawn Man was not shared by most of his subordinates at AMNH; see discussion in Constance Areson Clark, *God—or Gorilla: Images of Evolution in the Jazz Age* (Baltimore: Johns Hopkins University Press, 2008).
[299] Marianne Sommer, *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2016).

were rising in the invigorating atmosphere of the relatively dry plateaus of central Asia."[300] This theory also, incidentally, allowed Osborn to score points off Eugène Dubois, who had initially refused Osborn and the AMNH access to casts of his famous Java Man (*Pithecanthropus erectus*) finds.[301] Without the environmental stimulus, the Dawn Man could never have come to exist. "All authorities are today agreed in placing the center of dispersal of the human race in Asia," wrote Osborn, who proceeded to center himself as the most relevant modern authority, describing the work of the Central Asiatic Expeditions and quoting liberally from a speech he had given in Beijing in 1923 titled "Why Mongolia May Be the Home of Primitive Man."[302]

The origins of the Dawn Man marked a high point in human evolution, at a time "when Nature had full control," and correspondingly could most rigorously direct evolutionary process of humans and animals alike.[303] Modern civilization, Osborn noted, was interfering in the natural processes of change and progress, through the effect of dysgenic conflicts like World War I, which had killed off many of the "best men" of the major European countries. Osborn drew a direct link between his museum's hallmark research into the Central Asian origins of humanity and eugenic politics and doctrines of race purity. The Dawn Man's superiority over other anthropoid apes prefigured, in Osborn's mind, the modern rise of "the three great races – the Alpine, the Mediterranean, and the Nordic," and contributed to the "racial soul," a sort of mélange of mental and spiritual characteristics that characterized the group but were also mirrored in the essence of individuals.[304] The harsh climate of arid Mongolia had served to temper the spiritual, mental, and physical qualities of the prehistoric Dawn Man; the principles of

[300] Osborn, *Parnassus*, 165. Italics in the original.
[301] Osborn had to invoke the political influence of the Dutch ambassador to Washington to gain access; see Sommer, 73.
[302] Osborn, *Parnassus*, 162-163.
[303] Osborn, *Parnassus*, 185-186.
[304] Osborn, *Parnassus*, 186.

race improvement, like those laid out at the Second International Congress of Eugenics in 1921, which Osborn attended, would serve the same purpose in the twentieth century.

Osborn recapitulated his ideas about the history of the development of the human races from the Dawn Man to the present in an introduction to Madison Grant's 1933 book, *The Conquest of a Continent, or the Expansion of the Races in America*.[305] In fact, Osborn's text was an almost word for word repeat of the conclusion of his last lecture in *Man Rises to Parnassus*, although without the extensive discussion of the previous decade's AMNH expeditions. Grant, better known for his 1916 book *The Passing of the Great Race*, was both one of the foremost voices of American scientific racism in the early twentieth century, and Osborn's close friend. *Conquest of a Continent* was not a significant departure from *Passing of the Great Race*, although it dealt more closely with race and immigration in the United States. In the second chapter, "The Cradle of Mankind," Grant glossed the Asian origins hypothesis, describing the emergence of a "savage, powerful, clever biped," a pack hunter or tool user who had ventured out onto the plains of Central Asia some seven million years ago.[306] Grant favored a multi-stage model for human evolution, with successively more advanced hominids moving from the "original center of dispersal" in Central Asia out to colonize the rest of the world: "The existing races of mankind, and those either entirely extinct or now absorbed into other races, had their distinctive areas of differentiation and periods of radiation from Eurasia over the habitable globe. The most primitive types are now found farthest from this original center of distribution in countries where through isolation they escaped competition with the higher types which evolved later."[307] In a nutshell, Grant was repeating W.D. Matthew's basic thesis of Central Asian

[305] Madison Grant, *The Conquest of a Continent, or The Expansion of the Races in America*, with an introduction by Henry Fairfield Osborn (New York: Charles Scribner's Sons, 1933).
[306] Grant, 17.
[307] Grant, 19.

dispersion and resultant population displacement giving rise to racial variations in humankind. Grant's interests and emphasis in *Conquest of a Continent* were not prehistoric paleontology: "The Cradle of Mankind" concluded by explaining itself as mere set-up for more detailed study of "the distribution and racial influence of the Nordics in western Europe" and the United States.[308]

Grant's relationship with Osborn, Osborn's introduction, and Grant's use of Matthew's exact phrase show how the Asian origins hypothesis became a pillar of scientific support for doctrines of racial superiority going into the 1930s, both in the United States but also in Nazi Germany. As Jonathan Peter Spiro has described, Grant's 1916 *The Passing of the Great Race* was enormously popular with Adolf Hitler and the scientific elite of the Nazi party.[309] Building on that political affinity and established reader base, *Conquest of a Continent* was translated into German in 1937, with an additional foreword by Eugen Fischer, the director of the Kaiser Wilhelm Institute of Anthropology, Human Heredity, and Eugenics. Selections were reprinted in newspapers and a second German reprint was issued in 1940.[310] Aside from his relationship with Grant, Osborn enjoyed a certain degree of popularity in Germany in his own right. He visited Frankfurt in 1934, where he hugely enjoyed his travels and received an honorary doctorate. Already positively inclined towards Nazism and eugenics, Osborn returned to the US full of enthusiasm for the racial policies of both Hitler and Mussolini.[311]

Beyond passing references in Madison Grant, the Asian origins hypothesis became an object of study in Germany in the 1930s in its own right. The prehistory of Central Asia was

[308] Grant, 38.
[309] Jonathan Peter Spiro, *Defending the Master Race: Conservation, Eugenics, and the Legacy of Madison Grant* (Burlington: University of Vermont Press, 2009).
[310] Spiro, 360.
[311] Spiro, 370-371.

among the research priorities of Heinrich Himmler's pet research institute, the SS-Ahnenerbe or Forschungsinstitut für Geistesurgeschichte (Institute for the History of Ancient Cultures).[312] The research interests of the Ahnenerbe were, ostensibly, the autochthonous cultural history of the Germanic peoples, especially the Indo-German or Aryan forebears of the modern German nation. However, the goals of the specific projects and expeditions that were funded were wide-ranging and often bizarre even in the eyes of the Ahnenerbe members, who were also frequently locked in internal power struggles for resources and prestige. Himmler supported expeditions to locate key sites in the history of Aryan conquests throughout Eurasia, and enjoyed a close friendship with the Germanophile—and recipient of Osborn's second-hand camels—Sven Hedin after the latter's return to Europe from China in 1934.[313]

On one hand, the SS-Ahnenerbe does not appear to have been particularly interested in understanding the evolutionary origins of the human species, or even in searching for pre-hominin fossils in the regions of Central Asia that were of cultural and mythological interest to them. The 1938-1939 Ahnenerbe expedition to Tibet led by Ernst Schäfer and Bruno Beger to investigate the possibility of an Aryan conquest of the Himalayas and establish the racial identity of indigenous Tibetans was the closest that the organization came to directly investigating the Asian origins hypothesis.[314] On the other, it's difficult to consider the status of the Asian origins hypothesis in the 1930s without considering one Nazi racial research into Aryan origins as an

[312] On the SS-Ahnenerbe and Indo-German/Aryan research in Hitler's Germany, see Heather Pringle, *The Master Plan: Himmler's Scholars and the Holocaust* (London: Fourth Estate, 2006); and Stefan Arvidsson, *Aryan Idols: Indo-European Mythology as Ideology and Science*, trans. Sonia Wichmann (Chicago: University of Chicago Press, 2006).
[313] On Hedin's relationship with Himmler and the Nazi regime, see Peter Hopkirk, "Introduction," in Sven Hedin, *My Life as an Explorer* (New York: Kodansha, 1996); and Sarah K. Danielsson, *The Explorer's Roadmap to National Socialism: Sven Hedin, Geography, and the Path to Genocide* (Farnham: Ashgate, 2012).
[314] See Pringle, especially ch 12.

(extreme) iteration of that hypothesis. The Ahnenerbe's interests, as well as Madison Grant's racial theories and those of the Nazi state, shared a common intellectual and cultural genealogy with the overarching ideas that justified committing financial and technological resources to meticulously scouring the deserts and hillsides of China and Mongolia for hominin fossils. By the early 1930s, Osborn was deeply personally unpopular within the AMNH and viewed as out of date on evolution by many of his colleagues, but he was still embedded within the American scientific establishment by dint of his institutional base and his social and political connections.[315] There were very few degrees of separation between the mainstream American, Chinese, and French expeditions and the Nazi fringe.

Asia and the Dispersal of the Primates

Through the early 1920s, scientists associated with the Chinese Geological Survey continued to collect odd fossil fragments from a cave site outside the village of Zhoukoudian (alternately Choukoutien), twenty-six miles southwest of Beijing. In 1926, J. Gunnar Andersson and Otto Zdansky discovered a complete fossilized molar and pre-molar tooth at the Zhoukoudian dig site known locally as "Dragon Bone Hill." The two teeth were brought to Beijing to be analyzed, and became the first specimens of a new species, *Sinanthropus pekinensis* – known in the popular press as "Peking Man."[316]

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[315] Osborn's many autocratic tendencies and strong sense of his own importance became increasingly marked towards the end of his tenure as AMNH president; see discussion in Rainger, *An Agenda for Antiquity*.

[316] The best in-depth study of Peking Man, with an emphasis on the specimen's changing cultural and political meaning in the People's Republic, is Sigrid Schmalzer's *The People's Peking Man*. For an overview by a participant in the Zhoukoudian excavations, see Jia Lanpo and Huang Weiwen, *The Story of Peking Man: From Archaeology to Mystery*, trans. Yin Zhiqi (Beijing: Foreign Languages Press/New York: Oxford University Press, 1990).

Even before the discovery, members of the Chinese Geological Survey were thinking hard about possible evidence of prehistoric humans in China. One of the most prominent and prolific of these researchers was the Canadian anatomist and physician Davidson Black. Like Andersson, Black was a foreign researcher who had arrived in China to work in a more practical field (in his case, medicine) and become inexorably drawn into the orbit of the Chinese Geological Survey. After finishing his medical education in Toronto, Black went to the UK to study with the English anatomist Grafton Elliot Smith at the University of Manchester. As a graduate student in Manchester, he also overlapped with paleontologist David Meredith Seares Watson, later a professor of zoology at University College London, and Black's lifelong friend. Although ostensibly there to work on the neuroanatomy of lungfish, Black was much more interested in Elliot Smith's ongoing research on the morphology of the newly discovered Piltdown cranium and jawbone.[317] Fascinated with the problem of human origins, Black accepted a post at the Peking Union Medical College in 1918, which brought him to the most promising region of the globe for human paleontology. In Beijing, he became a contact point for the international community of human evolution and prehistory researchers, not only in the Anglophone world, but also with French researchers like Teilhard de Chardin and Henri Breuil.[318] He was also well connected in the Chinese scientific community, where he was a member of the Geological Society of China and president of the Anatomical and

[317] Grafton Elliot Smith, "Davidson Black, 1884-1934," *Obituary Notices of the Fellows of the Royal Society* 1, no. 3 (1934), 361-365.

[318] Roy Chapman Andrews purportedly tried to recruit Black to join the Third Asiatic Expeditions as an anatomist and paleontologist, but Black emphatically refused—probably because he had teaching and research obligations in Beijing, possibly also because he didn't like Andrews' style. See Dora Hood, *Davidson Black: A Biography* (Toronto: University of Toronto Press, 1964), 61.

Anthropological Association of China, and known for being a generous, fair-minded, and egalitarian colleague and research collaborator.[319]

Reading W.D. Matthew's 1915 monograph on climate and evolution had helped propel Black towards China, and in 1925 he began his own contribution to the problem of primate evolution and the Asian origins hypothesis.[320] "I have been indulging in an orgy of fairy tale writing recently, and the result is halfway through the press," Black wrote to DMS Watson in London.[321] While the process of proofing the text for publication was lengthy, he was nonetheless pleased by the publication's prospects.

> It is all about where man and his kin began and when – entitled Asia and the Dispersal of Primates with maps and time tables all neatly arranged for tourists. I wrote it as a brief to convince the [Rockefeller] Foundation that it would be worthwhile to contribute to the financing of an expedition into central Asia – a joint undertaking between J.G. Andersson and myself.[322]

In "Asia and the Dispersal of the Primates," Black began with Matthew's conclusions on the relationship between climate change, especially the advance and retreat of glaciers in the northern hemisphere during past ice ages, and the evolution of species. He used data from the detailed studies of Chinese geography, geology, and paleontology, plus his own expertise in comparative anatomy and primate morphology, to extend Matthew's conclusions towards a detailed analysis of the biogeography of the living primate species, as well as the distribution of

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[319] See Schmalzer, 43-44. Schmalzer notes that this description of Black is confirmed in both Chinese and English language histories of the Zhoukoudian excavations.
[320] Davidson Black, "Asia and the Dispersal of Primates," *Bulletin of the Chinese Geological Society* 4, no. 2 (December 1925), 133-183. Matthew's 1915 work is obviously Black's point of inspiration and departure, being mentioned as early as the third paragraph of the introduction.
[321] Davidson Black to DMS Watson, 30 March 1926. NCUACS 42.4.93/B.22 China, D.M.S. Watson papers, UCL Special Collections, London. The publication date for what was indeed called "Asia and the Dispersal of the Primates" is given as December 1925; clearly moving the piece to actual physical published status took a little longer.
[322] Davidson Black to DMS Watson, 30 March 1926.

known fossil ape specimens. It was clear to Black, both from his own research and Matthew's work, that environmental change was a key driver of evolutionary change, and that much of this environmental change could be explained by shifts in the tectonics of the Asian continent, a conclusion he reached after reading the work of his colleague Amadeus W. Grabau, of the Chinese Geological Survey.[323] On the relationship between "the dynamics of continent building" and the evolution and dispersal of primates, Black wrote: "This is particularly true of Pal-Asia, especially of its central part, since there is such strong presumptive evidence that the latter and the center of Old World primate dispersal are very closely related if not identical regions."[324]

One key point of primate dispersal was that successive waves of evolutionary development would tend to push less evolved 'precursor' species out to the margins of the continents, away from the central point of distribution. Here, new evidence from the fossil record provided further support for Black's conclusions. Raymond Dart's "recently discovered specialized anthropoid *Australopithecus afarensis*," nicknamed the 'Taung Baby,' was a small-skulled ancient primate unearthed in South Africa, precisely where both Matthew and Black predicted that such an ancient, and relatively less evolved species should have ended up if it had

[323] Black, "Asia and the Dispersal of Primates," 172-173. 'Tectonics' is used here in the sense of meaning 'changes in the positioning of the earth's crust,' and local shifts in environmental conditions related to geological subsidence or uplift. Grabau's research relied on the theory of geosynclines, not the theory (more familiar to current readers) of plate tectonics. On the history of geological skepticism on continental drift, see Oreskes. On geosynclines and Asian geology, see A.W. Grabau, "Migration of Geosynclines," *Bulletin of the Geological Society of China* 3 (1924), 208-349.

[324] Black, "Asia and the Dispersal of Primates," 172. "Pal-Asia" referred to the northern Eurasian landmass (excluding India and Arabia). See discussion in Chris Manias, "From *Terra incognita* to Garden of Eden: Unveiling the Prehistoric Life of China and Central Asia, 1900-1930," in Robert Bickers and Isabella Jackson, eds. *Treaty Ports in Modern China: Law, Land, and Power* (New York: Routledge, 2016), 201-219.

been pushed away from its point of origin by the development of more advanced primate species.[325]

Humans presented a somewhat different zoogeographical problem, since "From the standpoint of zoology, all the existing so-called races of men represent but varieties of a single species whose range has become extended over the whole habitable surface of the globe."[326] Black divided modern humans into groups by skin tone, eschewing racial terminology based on skull morphology for "Leucoderm," "Xanthoderm," and "Melanoderm," and argued that the greater number of specialized physical characteristics of Melanoderm populations, which for the purposes of the article Black defined as the peoples of sub-Saharan Africa, or the "Ethiopian region" in his biogeographic schema, meant that these populations had been geographically isolated for a longer period of time. This satisfied the conditions for applying the progressive evolution dispersion model while still defining humans as a single species.[327] However, if Central Asia had been the locus of primate evolution up to and including modern humans, then Black reasoned there should be more local fossil evidence to supplement the meagre quantity of hominid fossils that had been discovered by that point.

Digging at Zhoukoudian

[325] Black, "Asia and the Dispersal of Primates," 152. Why the most ancient species of ape should have chosen to head for South Africa rather than South America or the farthest edges of the European continent was not directly addressed.
[326] Black, "Asia and the Dispersal of Primates," 153.
[327] Black, "Asia and the Dispersal of Primates," 155. The Leucoderm group consisted of white Europeans; the Xanthoderm group included essentially everyone else on earth, although Black introduced subdivisions between the indigenous populations of the Americas and the populations of Central, South, and East Asia, and described racial variation from west to east across the Eurasian continent as being on a gradient from Leucoderm to Xanthoderm.

When Black received the news of Zdansky and Andersson's discovery, he was elated. In October 1926, he wrote to Watson: "Now for the great news – remains of early man or his brother have at last been found here in east Asia quite near Peking. I enclose a copy of a spiel I have sent to 'Nature' on the subject which will give you the gist of the whole thing."[328] While the relative dating for the specimen remained spotty, Black's 'spiel' for *Nature* laid out the stakes of the discovery clearly:

> Whether it be of late Tertiary or of early Quaternary age, the outstanding fact remains that, for the first time on the Asiatic continent north of the Himalayas, archaic hominid fossil material has been recovered…The actual presence of early man in eastern Asia is therefore now no longer a matter of conjecture.[329]

In London, Roy Chapman Andrews was giving lectures about his own quest for evidence of 'the actual presence of early man in eastern Asia,' and had to hastily add a concluding addendum to his lecture at the Central Asiatic Society, describing the discovery as an ancient human tooth that predated any other hominid fossil find in the world. He concluded: "It is a find of great importance in our hypothesis of Asiatic origin," with no further comments.[330]

From the standpoint of collecting paleontological evidence, an odd, ancient human-like tooth was far from being a complete hominid skeleton. In a letter to J.G. Andersson, Teilhard de Chardin expressed his personal doubts that the teeth were, in fact, of human origin, since they could easily belong to some other carnivore, given the lack of roots that made it difficult to

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[328] Davidson Black to DMS Watson, 27 October 1926. NCUACS 42.4.93/B.22 China, D.M.S. Watson papers, UCL Special Collections, London.
[329] Davidson Black, "Tertiary Man in Asia: The Chou Kou Tien Discovery," *Nature* 118, no. 2977 (November 20, 1926), 733-734.
[330] Andrews, "On the Trail of Ancient Man in Central Asia," 56. The published account of the lecture shows that this final sentence was followed by "(Great applause.)" From references in a letter from Black to Watson in January 1927, it seems likely that Watson attended this or one of Andrews' other lectures in London. (See Davidson Black to DMS Watson, 6 January 1927.)

assign the teeth to a definite species.[331] The Geological Survey of China and the Peking Union Medical College (represented by Davidson Black) immediately began to organize a systematic program for excavating further at Zhoukoudian. "There is still a large part of the original deposit undisturbed," wrote Black, "so we have high hopes."[332] The Geological Survey made an application to the Rockefeller Foundation for a grant appropriation to undertake the work, and received positive news early in January 1927. This was the "extractive magic" of the hunt for "primitive man" in action, and Black hoped that he would "have our gang together and ready to start at the Chou Kou Tien and neighboring sites" just as soon as the spring weather cooperated.[333]

The original grant covered two years of fieldwork excavations, and then morphed into a more permanent arrangement, known as the Cenozoic Research Laboratory, in 1929. The Cenozoic Research Laboratory, or CRL, was technically a department of the Geological Survey, but housed in the anatomy department building at the Peking Union Medical College.[334] Davidson Black was the honorary director of the laboratory, while V.K. Ting was designated Honorary Director of Cenozoic Research. At Zhoukoudian, the 1927 dig was led by geologist C. Li, and by Li in collaboration with the paleontologists W.C. Pei (Pei Wenzhong) and C.C. Young beginning in 1928.[335] Wong Wen-Hao, the director of the Geological Survey, wrote the

[331] This letter dates to October 24, 1926, and was reproduced in full in Andersson, *Children of the Yellow Earth,* 104-105. As Andersson explained, the chief challenge was that predator teeth, when sufficiently worn, are extremely hard to distinguish from human teeth without the distinctive roots.
[332] Davidson Black to DMS Watson, 27 October 1926.
[333] Davidson Black to DMS Watson, 6 January 1927.
[334] The Peking Union Medical College was also funded by the Rockefeller Foundation, via the China Medical Board. On the relationship between foundation funding and scientific research in the interwar period, see Robert E. Kohler, *Partners in Science: Foundations and Natural Scientists, 1900-1945* (Chicago: University of Chicago Press, 1991).
[335] Andersson, 108.

introduction to the monograph formally describing the Peking Man finds.[336] Foreign scientists working with the Geological Survey, like Black, Andersson, or Andersson's fellow Swede, paleontologist Anders Birger Bohlin, participated in the Zhoukoudian research either in the field or from the laboratory in Beijing, but the institutional structure of the CRL and the nature of the grant supporting the Zhoukoudian work emphasized that both the excavations and any hominid material that might be discovered were credited to the Chinese researchers and to the republican state.

In 1929, W.C. Pei and a team of fieldworkers made a major breakthrough at Zhoukoudian when they unearthed a nearly complete skullcap of *Sinanthropus pekinensis*. Over the next few years, Pei and his associates excavated the remains of at least ten individuals, primarily crania and mandibles, as well as a small amount of post-cranial skeletal material. Even more interesting, the caves also contained evidence of bone and stone tools, and burnt charcoal suggested that 'Peking Man' might have had some command of fire. The tools were similar to ones that had been unearthed in Europe in strata of a roughly equivalent geological age, but Black, Pei, Young, and Teilhard de Chardin, who had returned to China to join the Zhoukoudian excavations, believed that it was unlikely there was an actual connection between these two tool-producing cultures on opposite ends of the Eurasian landmass. [337] Morphological analysis suggested that 'Peking Man' should be included within the family Hominidae, but in a separate genus from *Homo sapiens*, and the name *Sinanthropus pekinensis* continued to be used. [338]

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[336] Davidson Black, Teilhard de Chardin, C.C. Young, and W.C. Pei, "Fossil Man in China: The Choukoutien Cave Deposits with a Synopsis of Our Present Knowledge of the Late Cenozoic in China." *Geological Memoirs*, series A, no. 11 (Peping: The Geological Survey of China and the Section of Geology of the National Academy of Peiping, 1933).
[337] Black et al., 60-61.
[338] On this point: "…but *Homo* as we know is by no means the only genus included within the latter, all of whom are *hominid* and *human* and may also with perfect propriety be referred to as *man*." Black et al., 109.

Interest in the excavations at Zhoukoudian was not limited to paleontologists already working in China, and Black was an important point of contact for members of the international community who wanted news of the latest finds, preprints of forthcoming articles, or information about the possibilities for collaborative work. In 1933, Black exchanged letters with French prehistorian Henri Breuil, who was interested joining the digging for one season as well as joining in studying some of the newest Zhoukoudian material.[339] Black was excited by the possibilities of getting Breuil's opinions on the stone and bone tools, although he had to warn his French colleague that funding had already been committed for the year 1934, meaning that the earliest that Breuil could join the work was the spring of 1935.

By that time, excavations had been expanded to encompass two separate localities, the Upper Cave and Lower Cave, and Black and Pei could make comparative analyses of material taken from every level of the deposit. The site's topography meant that fossilized material was relatively easy to remove from the ground. Overwhelmed by the wealth of material coming into his laboratory for analysis, Davidson Black – already known for working late nights in the Cenozoic Research Lab – began working even longer hours despite his increasingly poor health. He died in the spring of 1934 of heart failure, at age forty-nine, with the Peking Man specimens on the desk before him. His immense administrative responsibilities at the Cenozoic Research Lab meant that finding a replacement was of paramount importance if the analytic work on the Zhoukoudian specimens was to continue.

The Rockefeller Foundation stepped in to introduce Franz Weidenreich as an acceptable successor. Formerly a professor of anatomy at the University of Frankfurt with a strong interest in anthropology and fossil hominids, Weidenreich had left Germany for a temporary

[339] Davidson Black to Henri Breuil, 19 December, 1933. Br 27 Black-Boureau, Fonds Breuil. II. Correspondance de l'abbé Breuil. Bibliothèque centrale du Muséum nationale d'histoire naturelle, Paris.

appointment at the University of Chicago shortly after Hitler came to power in 1933.[340] Unable to return to his former position because of his Jewish ancestry, Weidenreich headed west across the Pacific instead, arriving in Beijing in 1935 to take up the position of honorary director of the Cenozoic Research Lab. He worked closely with W.C. Pei, C.C. Young, and Teilhard de Chardin, who were overseeing the continuing excavations in the field, and continued Black's careful work in the lab, freeing pieces of *Sinanthropus* bone from the surrounding rocky matrix. With each year that the dig at Zhoukoudian continued, more interesting bones or pieces of bones were found – three more nearly complete *Sinanthropus* skulls in 1936, the fragments of a mostly complete femur in 1937 – allowing the CRL research group to build a more complete image of the ancient hominid.

Still, many questions remained open, especially about the chronological and familial relationships between *Sinanthropus pekinensis* and other known specimens of ancient hominids and prehistoric humans. Pei, Young, and Weidenreich were especially curious about the relationship between their *Sinanthropus* and the famous *Pithecanthropus erectus* specimen found by Eugène Dubois in Java in 1891. After facing skepticism from the scientific community after he announced the discovery of the "missing link," Dubois had retreated to his home in the Netherlands and refused all requests for access to his original fossils, making it nearly impossible to perform the kind of detailed comparative analysis that the *Sinanthropus* team needed. In 1937, researchers with the Geological Survey of the Netherlands East Indies announced the discovery of another *Pithecanthropus* skull near Sangiran, on the island of Java, and offered to let Weidenreich compare his specimens with theirs.[341]

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[340] W.K. Gregory, "Franz Weidenreich, 1873-1948," *American Anthropologist*, new Series 51, no. 1 (Jan.-Mar. 1949), 85-90.
[341] G.H.R. von Koenigswald, *Meeting Prehistoric Man*, trans. Michael Bullock (New York: Harper, 1956).

The Sangiran *Pithecanthropus* was the discovery of Atmowidjojo, an experienced Javanese field collector, and Gustav Heinrich Ralph von Koenigswald, a young German paleontologist who had joined the NEI Colonial Geological Survey after he graduated from university during worst years of the Weimar Republic's economic prostration.[342] Atmowidjojo and von Koenigswald had achieved some early renown with the discovery of eleven fossilized early human skulls that resembled Neanderthals in a single deposit near Ngandong between 1931 and 1933. However, since the NEI Geological Survey had been "staffed with enthusiasm" right before the beginning of the global Great Depression, von Koenigswald's position was terminated at the end of 1935.[343] In a climate of economic instability and when the export trade that underwrote the Dutch colonial government's annual budget was threatened by protectionist legislation in both the United States and Europe, there was no money to share for geological surveying that did not relate directly to mineral and oil prospecting.[344] Before von Koenigswald had to leave Java in search of other work, Teilhard de Chardin, who had visited his dig at Sangiran in 1935, arranged for von Koenigswald to apply to the Carnegie Institution in Washington D.C. for research funds, which allowed him to continue with the Geological Survey, albeit with an external salary.

The Carnegie money also allowed von Koenigswald to go to the United States, where he attended a conference on the international study of early humans held in Philadelphia in 1937.

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[342] von Koenigswald, *Meeting Prehistoric Man*, 23, 33.
[343] von Koenigswald, *Meeting Prehistoric Man*, 92.
[344] The economic turmoil led to preliminary talks between Japan and the Netherlands over colonial trade, which Nagaoka Shinjiro has argued can be seen as the first step towards the Japanese takeover of the islands in the Second World War. Hence, von Koenigswald's downsizing and then later internment when the Japanese invaded Java in 1942 is sort of a mini-narrative of the political-economic trajectory of the Netherlands East Indies. See Nagaoka Shinjiro, "Economic Demands on the Dutch East Indies," in Morley, *The Fateful Choice: Japan's Advance into Southeast Asia, 1939-1941* (New York: Columbia University Press, 1980), 125-153.

On his return to Java, he stopped in Beijing to make the acquaintance of Pei, Weidenreich, and Young, and to see some of the *Sinanthropus* skulls. After further excavations by von Koenigswald and Atmowidjojo resulted in fragments of another possible *Pithecanthropus* cranium that was very like the *Sinanthropus* crania excavated in Zhoukoudian, von Koenigswald and Weidenreich brought their specimens together for comparison in Beijing. Although they identified minor physical differences, Weidenreich and von Koenigswald argued that the morphological similarity meant that *Pithecanthropus* and *Sinanthropus* were members of the same species, and should be considered "related to each other in the same way as two different races of present mankind."[345]

Between 1900 and 1940, the number of fossil hominids and early humans discovered in continental and archipelagic Asia had increased from one specimen to more than twenty. These discoveries were almost entirely driven by the work of the geological surveys of China and the Netherlands Indies. While not central to the economic geology or the more general surveying and mapping work of these bodies, the human origins research that was conducted in these institutional contexts was remarkably productive, and the successes of Pei, Weidenreich, and von Koenigswald are strikingly different from the repeated frustrations experienced by Roy Chapman Andrews and the rest of the AMNH expedition.

While his turbo-charged style made for excellent newspaper copy, even Roy Chapman Andrews acknowledged that steady, comprehensive surveying and steady excavation work would be required to actually find fossil evidence of ancient humans in Central Asia.[346] Finding

[345] G.H.R. von Koenigswald and Franz Weidenreich, "The Relationship Between Pithecanthropus and Sinanthropus," *Nature* 144, no. 3657 (December 2, 1939), 926-929. See also Franz Weidenreich, G.H.R. von Koenigswald, "Discovery of an Additional *Pithecanthropus* skull," *Nature* 142, no. 3598 (October 15, 1938), 715.
[346] See the concluding chapter of Andrews' *This Business of Exploring*.

any fossil material, much less small hominid fossils, involves a lot of contingency, but the systematic data gathering practices of the geological surveys created many more opportunities for affiliated researchers to get lucky. Work could be slow, but the institutional stability provided by the government geological surveys, when paired with external funding from philanthropic scientific foundations created the conditions that allowed geologists and other researchers to fill gaps in their knowledge of the geology of Asia, narrowly conceived, and satisfy the conditions of the inductive Asian origins hypothesis.

Global Connections and Wartime Science

The territory around Zhoukoudian had been traded back and forth in civil conflicts in the late 1920s, with the armies of two different regional warlords coming so close to the village that the workers in the dig could hear gunfire and shelling, but the excavation site was under the protection of the republican government, represented by the Geological Survey, and was not disturbed.[347] Work continued at the Zhoukoudian dig and the Cenozoic Research Lab even as the political stability of the Chinese republic declined across the 1930s. The Japanese invasion of Manchuria had little impact on the day-to-day conduct of research at Zhoukoudian, although in New York City, AMNH director George Sherwood reported that Roy Chapman Andrews had apparently reached out to the Japanese occupation government and received a favorable response to his proposal to re-start his paleontological work in what was now the puppet state Manchukuo.[348]

[347] See Schmalzer, ch 1.
[348] George Sherwood, Report of the Director to Meeting of the Board of Trustees, November 14, 1932, 4. (CA: 1126, box 301, Director's Reports).

Even as the Republican government wavered and the Geological Survey found itself increasingly low on money, the Rockefeller Foundation continued to provide financial support and institutional stability to the CRL. Excavations at Zhoukoudian continued until the Republic of China was invaded by Japanese forces on July 7, 1937.[349] There was still plenty of work left to be done: the bottom-most strata of the lower cave had not yet been reached, and given that "…a very important find (upper jaw of *Sinanthropus* with teeth) was recovered there on the very last day of the excavation," it seemed likely that future excavations would reveal further paleontological riches.[350] Such work would have to wait for more settled times. W.C. Pei, who had been directing the dig, returned to Beijing to carry on his research work as usual, "under special condition[s] and with much difficulties."[351] By February 1938, the only staff remaining at the Cenozoic Research Lab were the human origins researchers. The Geological Survey's branch office in Beijing was closed at the end of 1937, with the remaining personnel from Beijing and Nanking, the invaded Republican capital, relocated to Changsha, in south-central China, and other cities in the interior, where the Survey's geologists worked to develop critical mineral and petroleum sources to keep the war effort running.[352]

Nonetheless, research continued. Pei unearthed four incomplete limb bones (two femurs, one radius, one humerus) from *Sinanthropus* specimens from blocks of rocky matrix from Zhoukoudian that had been brought to the Beijing lab and set aside for later analysis.[353] In an accounting in 1941, Franz Weidenreich estimated that almost two hundred scientific papers (in

[349] See Rana Mitter, *China's War with Japan, 1937-1945: The Struggle for Survival* (London: Allan Lane, 2013).
[350] Franz Weidenreich, "Memorandum on the Present State of the Cenozoic Research Laboratory," June 11, 1941. (W445, 5:1, AMNH).
[351] W.C. Pei to Miles Crawford Burkitt, February 5, 1938. Mss Add.7959, box 3. (Cambridge University Library).
[352] See Shen, *Unearthing the Nation,* especially ch 5.
[353] Pei to Burkitt, February 5, 1938.

four different languages) had been published by the CRL's researchers since the lab's founding.[354] Some of the most circulated papers described the different new *Sinanthropus* finds, while others, like an article written by W.C. Pei and published in London, used stratigraphy and index fossil analysis to correlate the age of the Zhoukoudian finds with bones and tools from other sites in Eurasia.[355] Both types of papers were important, putting the details of the *Sinanthropus* bones into the hands of other researchers, and placing 'Peking Man' in global perspective. Pei concluded that the oldest Zhoukoudian bones were probably from the Upper Pleistocene period, putting them on par with the (dubiously valid) Piltdown mandible and skull, and making *Sinanthropus* the same age as the fabled European 'Dawn Man.' Henry Fairfield Osborn, who died in 1935, does not seem to have applied his term "Dawn Man" to the *Sinanthropus* finds, either because he wanted to reserve the name for an earlier hominid predecessor, or because he refused to acknowledge that his institution had been scooped in their fossil quest.

Even if *Sinanthropus* was part of a global question, the fossils had a local existence in a research institute outside Beijing, which, as the Second Sino-Japanese War continued, meant the Zhoukoudian artifacts and specimens were directly in the path of the invading Japanese army. In January 1941, Yin Tsan-Hsun, director of the Chinese Geological Survey, and Wong Wen-Hao wrote to the director of the Peking Union Medical College about the future of the Cenozoic Research Laboratory.[356] The key challenge was to dispose of the "various valuable scientific

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[354] Franz Weidenreich, "Memorandum on the Present State of the Cenozoic Research Laboratory," June 11, 1941. (W445, 5:1, AMNH).

[355] Wen-Chung Pei, "An Attempted Correlation of Quaternary Geology, Palaeontology and Prehistory in Europe and China," Occasional Paper No. 2, University of London Institute of Archaeology. (1939) Miles Crawford Burkitt correspondence and papers, Cambridge University Library. (GBR/0012/MS Add.7959, box 4).

[356] Wong Wen-Hao (Weng Wenhao) and Yin Tsan-Hsun (Yin Zanxun) to H.E. Houghton, 10 January, 1941. (Mss W445, 11:9, AMNH).

materials" held by the Cenozoic Research Laboratory, and to find a secure home for "materials of special importance such as the remains of Sinanthropus, the typical specimen of the artifacts and other important fossils." The front lines were coming closer to Beijing, which increased the likelihood that the college buildings could be damaged by shelling or aerial bombing, while the deteriorating diplomatic relations between the US and Japan suggested that the college and laboratory could not rely on their connections to the American Rockefeller Foundation to keep them safe.

The original agreement with the Rockefeller Foundation that provided the funding required materials to remain in China. On strictest terms, the fossils therefore had to be sent to join the Chinese Geological Survey and the rest of the Nationalist government in Chongqing.[357] From both a security and logistics standpoint, such a move would be difficult and dangerous. Also, moving the fossils to the new capital would not necessarily improve their odds of surviving the war unscathed, since, between May 1938 and August 1941, Chongqing was bombed by Japanese forces 218 times.[358] Instead, Wong and Yin requested that the specimens be shipped to America, "entrusted to some scientific institution for temporary safe-keeping during the war period in China after which they should be returned."[359] One proposal was the American Museum of Natural History.

The letter from Dr. Wong and Dr. Yin reached Franz Weidenreich in Beijing in the middle of March, where he was preparing to return to the United States with his family.

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[357] Wong and Yin to Houghton, Weidenreich, and Pei, 10 January, 1941. (Mss W445, 11:9, AMNH).
[358] Tetsuo Maeda, "Strategic Bombing of Chongqing by Imperial Japanese Army and Naval Forces," in Yuki Tanaka and Marilyn B. Young, *Bombing Civilians: A Twentieth Century History* (New York: The New Press, 2009),141; see also Mitter, *China's War with Japan*.
[359] The letter continues by discussing the dispersal of the Cenozoic Lab's personnel; director Weidenreich was to follow the general measures for PUMC personnel, while W.C. Pei and A.W. Grabau were directed to join the rest of the Survey in Chongqing.

Weidenreich had discussed a similar fossil export solution with H.E. Houghton, the American head of the Peking Union Medical College, and his colleague W.C. Pei, and was relieved to receive pre-emptive permission to make the necessary arrangements.[360]After much discussion, Weidenreich, Houghton, and Pei concluded that it was too risky for Weidenreich to carry the fossils through Japanese customs checkpoints in case they were discovered and confiscated. Instead, they decided to leave the original fossils as they were, "in the safe of the Cenozoic Research Laboratory in the building of the department of anatomy at the P.U.M.C."[361] Instead, Weidenreich brought casts, sketches, and photographs of the *Sinanthropus* material so he could continue to work on his monograph on the shape and evolutionary relations of the skull at the AMNH, where he had been offered a research fellowship. In New York, Rockefeller officials affirmed the Beijing decision: the safe would probably protect the specimens from accidental damage, and the chances of losing or damaging the fossils was much greater if they were moved from place to place.

On the morning of December 8, 1941, the Zhoukoudian fossils were packed into forty crates and given into the care of a group of American marines on their way to meet a ship in Qinhuangdao.[362] On the same day, although on the other side of the international date line, Japanese forces attacked the American naval base at Pearl Harbor and the Empire of Japan declared war on the United States. A few hours later, soldiers under the command of Hasebe

[360] Weidenreich to Wong, July 11, 1941. (W445, 11:9, AMNH).
[361] Weidenreich to Wong, July 11, 1941. (W445, 11:9, AMNH).
[362] Walter Fairservis to Franz Weidenreich, June 8, 1947. (W445, 11:9, AMNH); Fairservis, "Memorandum: Recovery of the Sinanthropus Material," September 7, 1947. The disappearance of Peking Man is probably the second most famous paleoanthropological mystery story of the twentieth century (with the first being the authorship of the Piltdown Man hoax). For an overview of the search, see Harry L. Shapiro, *Peking Man* (New York: Simon and Schuster, 1974). For the response in China, see Jia Lanpo, *Early Man in China* (Beijing: Foreign Languages Press, 1980), and Sigrid Schmalzer, *The People's Peking Man*.

Kotondo and Takai Fuyuji – in peacetime, both professors of anthropology in Tokyo – entered the grounds of the Peking Union Medical College and went straight to the safes in the rooms of the now-defunct Cenozoic Research Lab.[363] They found plentiful plaster casts of the fossils, but no original *Sinanthropus* skeletal material. Accompanied by military police, Hasebe and Takai cornered W.C. Pei, who had returned to Beijing, and tried to work out where the fossils had gone. In Pei's retelling, a military captain told him "China and Japan belong to one family," and that it was necessary for Pei to help the Japanese find the missing fossils and to remain in Beijing to collaborate on paleontological research.[364] Unfortunately for his interrogators, Pei had no idea what had happened to the Zhoukoudian material. Earlier in the year, he and Houghton had agreed that the American staff of the Peking Union Medical College would take responsibility for making emergency arrangements for the disposal of the fossils so that their Chinese colleagues could in good faith claim total ignorance of their plans. At the end of the war, though, it became clear that nobody knew where the *Sinathropus* fossils had ended up. It was ultimately

[363] Pei Wenzhong (W.C. Pei), "Studies in Chinese Prehistory," translated by Abraham Shen, ed. M.H. Fried. (MSS S537, box 75, AMNH): 5. Undated, but internal evidence suggests it was written in 1945. See also Weidenreich to Dr. Epper Larsen, USGS, March 12, 1946. (W445, 11:9, AMNH). In the letter, Weidenreich accused University of Tokyo physical anthropologist Hasebe Kotondo of being responsible for the arrest and torture of officers of the Peking Union Medical College, "whom he believed involved in the disappearance of the originals." Weidenreich cited a letter from Pei Wenzhong confirming that the material transferred to Tokyo "was taken away by order of the 1855 Japanese Division and Professors Hasebe and Takai of the Institute in Tokyo." (Weidenreich to Frank Whitmore, March 21, 1946). See also Jia Lanpo's account in *Early Man in China*: 31-33. The fossils were wrapped in tissue paper, cushioned with gauze, and then packed into two large cases by Hu Zhengzhi (Hu Ch'en-chih), who had also made the *Sinanthropus* casts that Weidenreich took to the US, and Ji Yanqing, a technician from the PUMC anatomy department; the last that Hu saw of the fossils, they were being transferred by PUMC officials to the strong room in the basement of one of the campus buildings.

[364] Pei, 6. The story Pei relates in the text is consistent in most of its details with all other accounts, including correspondence exchanged between different interested parties immediately after the end of the war, but it clearly was written a few years after the events it describes, and the exact audience and publication context for this text remains unclear, and I have not been able to fully identify the original published text. (This version comes from AMNH researcher Harry Shapiro's private notes.)

determined that the contingent of American marines had been stopped on their way to the port of Qinhuangdao, and their baggage lost – and the Peking Man specimens along with them.

The Skull of Sinanthropus Pekinensis

Throughout the war, Weidenreich remained in New York, working from AMNH on his studies of both the Zhoukoudian bones and von Koenigswald's *Pithecanthropus* skulls from Java. His monumental study of the collected *Sinanthropus* finds was completed and published in 1943, with the detailed morphological analysis based on the casts, sketches, and photographs he had brought with him as reference material.[365]

The Skull of Sinanthropus Pekinensis was a complete anatomical study of the Zhoukoudian cranial materials that also drew comparisons between *Sinanthropus* and other fossil hominids discovered around the world. He also expanded on an idea of racial variation in pre-human hominid populations that had first appeared in the short December 1939 comparative study of *Sinanthropus* and *Pithecanthropus* written with von Koenigswald.[366] For Weidenreich, 'racial' variation in ancient hominid populations was a useful way to categorize minute but measurable physical differences, and he proposed that this could be understood as an outgrowth of very small variations in the rates of evolution in different local hominid populations that then were carried forward as one hominid was replaced by or interbred with a more highly evolved successor type.

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[365] Franz Weidenreich, *The Skull of Sinanthropus Pekinensis: A Comparative Study on a Primitive Hominid Skull*, Palaeontologia Sinica, published by the National Geological Survey of China (Chungking) (New York: G.E. Steichert and Company, 1943).
[366] Weidenreich, *Skull of Sinanthropus Pekinensis*, 276-278. See also GHR von Koenigswald and Franz Weidenreich, "The Relationship Between Pithecanthropus and Sinanthropus."

In Weidenreich's model, modern *Homo sapiens* was a singular, unified species, albeit with minor morphological variations that could be used to differentiate various human races. The same principle could be applied to understanding ancient hominid variation. But Weidenreich took this idea a step further when he argued that local or regional 'racial characters' could be transmitted through the successive hominid populations, making it possible to track the emergence of racial physical attributes back before the emergence of the human species. Hypothetically, then, a species would emerge and then horizontally differentiate in different geographic locales, before interbreeding with the next-most-advanced group, which preserved specific physical characteristics in regional populations while establishing a sort of order of hominid species succession that was preserved in the global fossil record.[367] Therefore, Weidenreich concluded, while *Sinanthropus pekinensis* was an example of a universal stage in human evolution, it was rather more closely related to specific populations in Asia. *Sinanthropus* was not, in fact, the transitional stage between ape and human. Instead, it was possibly the first *Asian* 'Dawn Man.'

Weidenreich's ideas about race were both complicated and highly theoretical, and many of his contemporaries seem to have had difficulty parsing exactly what he meant. Harvard's E.A. Hooton very much liked Weidenreich's argument placing *Sinanthropus* in the line of closer

[367] This line of reasoning is why Weidenreich has been a favorite citation for subsequent proponents of the multi-regional theory of human origins, particularly Mitchell Wolpoff and Rachel Caspari; he was also a favored citation for Carleton S. Coon in the 1960s. Most their citations are actually to Weidenreich's 1947 article "Facts and Speculations Concerning the Origin of Homo Sapiens," *American Anthropologist* 49, no. 2 (April-June 1947), 187-203, which contains a more schematized version of his theory of horizontal racial differentiation and vertical species replacement, and a more forceful reiteration of his point from *Skull of Sinanthropus Pekinensis* that so-called "primitive peoples" are evolving at a slower rate, or after a long period of stasis. Weidenreich and ideas about race in both living and prehistoric human populations will be explored in depth in the next chapter, but it's worth mentioning here that Weidenreich is a particularly interesting character in this area because some of his reviewers had already flagged the racist political implications of his theory as early as 1944. Weidenreich then died in 1948, at the age of 75, right as a major realignment in the scientific framing of race was taking place.

relation to certain Central Asian populations, but wrote "(Reviewer's comment: ? ? ?)" next to Weidenreich's discussion of the usage of the term "primitive" in morphological comparisons.[368] The anonymous reviewer for *The American Naturalist* completely dismissed Weidenreich's racial variation theorizing, and suggested that while the book was "more than a very detailed osteological monograph…that in the end may prove to be its most valuable feature."[369] In another review published in *Science* in May 1944, anthropologist Loren Eiseley flagged the "racial characters" theory, along with Weidenreich's theory of variable tempos in the speeding up and slowing down of the progressive evolutionary development of different human racial groups, as "capable of political distortion and has social implications which will not be well received in some quarters."[370]

By identifying the physical features of *Sinanthropus* with present-day Mongolian populations, Weidenreich was writing against a conceptualization of 'Peking Man' as explicit evidence of an Asiatic center of origin for the human species. The skulls of *Sinanthropus* were instead incorporated into the history of a succession of evolving human populations that had remained fairly close to home. Still though, just because 'Peking Man' was not the missing link did not mean the Asian origins hypothesis was necessarily incorrect, or that there was no further fossil evidence to be found.

Conclusion

[368] E.A. Hooton, "The Skull of Sinanthropus Pekinensis," *American Anthropologist* 2, no. 3 (1944), 317-319.
[369] "The Skull Sinanthropus Pekinensis," *The American Naturalist* 78, no. 778 (Sept-Oct, 1944), 466-468.
[370] Loren C. Eiseley, "Review: Sinanthropus Pekinensis," *Science*, new series 99, no. 2577 (May 19, 1944), 408-409. Likewise, "The possibility of inequalities in the speed of development of various human types will be certain to add fuel to the controversy over racial superiority." (409) See also Warren Weaver to Franz Weidenreich, June 1, 1944. (W445, 11:9, AMNH).

In 1946, the Chinese Geological Survey made plans to re-establish the Cenozoic Research Laboratory and offered Weidenreich – now 73 years old and in less robust health – an appointment as the new laboratory head, an offer that he easily but regretfully declined.[371] A draft map from Weidenreich's 1947 monograph *Apes, Giants, and Men* shows a dotted line emerging from somewhere in the Himalayas that then transforms into a solid line on the southern border of China and diverges, one branch running north towards Beijing and Zhoukoudian, and the other running south along the Indonesian archipelago to terminate in Java.[372] It would be a task for future researchers to trace that path back to its source.

Who those researchers would be, though, was already changing. By 1947, W.C. Pei had secured a building in Beijing and his colleagues were tentatively beginning to undertake field research, although the continuing civil war between the Nationalists and the Communists made large-scale operations challenging.[373] The lab had fully re-opened by 1950, organized as part of the Institute for Vertebrate Paleontology and Paleoanthropology, affiliated with the Chinese Academy of the Sciences. Scientists from the Institute re-opened excavations at Zhoukoudian in the 1950s and made many rich finds, including of further *Sinanthropus* skulls, in the following decades.[374] The research teams were led and staffed entirely by Chinese nationals. Researchers like Pei and paleontologist C.C. Young exchanged letters and article reprints with colleagues in Britain, but the political realities of Mao-era China made it highly unlikely that foreign scientists from the capitalist West would join future archaeological or paleontological activities, especially

[371] Weidenreich to Epper Larsen, March 12, 1946. (W445, 11:9, AMNH).
[372] See folder contents, Mss W445, 11:7, AMNH.
[373] C.C. Young to D.M.S. Watson, September 5, 1947. (DMS Watson papers, UCL Special Collections. NCUACS 42.4.93/B.22).
[374] C.C. Young to D.M.S. Watson, October 9, 1950. (DMS Watson papers, UCL Special Collections. NCUACS 42.4.93/B.22). For the postwar work of the Institute for Vertebrate Paleontology and Paleoanthropology, see Schmalzer, *The People's Peking Man*.

at Zhoukoudian. Instead, many of these British and American researchers headed in another direction entirely: towards Africa.

Chapter 3. Our Ancestors, the Australopithecines?

Finding Early Man in East and South Africa

In January 1947, the inaugural Pan-African Congress in Prehistory opened in Nairobi, Kenya. Organized by the indomitable paleoanthropologist Louis Leakey, the Congress had brought together more than fifty researchers from twenty-six different countries and colonies, mostly on the African continent.[375] When he conceived the idea to hold a Congress, Leakey envisioned providing a forum for geologists, paleontologists, and archaeologists working all over Africa to connect and discuss mutual problems, including the standardization of nomenclature for geological periods and types of stone tools.[376]

Scientific interests may have spurred the Congress' formation, but imperial interests underwrote its activities. Financial grants from the governments of Kenya, Uganda, and Tanganyika (Tanzania), as well as from the Companhia de Diamante de Angola and several private sponsors based in Nairobi, sponsored the Congress, while the government of Portugal also sent unsolicited financial aid to back the publication of the proceedings.[377] As Kenneth Oakley, who was at the Congress representing both the Geological Society of London and the British Museum (Natural History division), reported to his colleagues in London, the body of

[375] K.P. Oakley, "First Pan-African Congress on Prehistory (Nairobi, January 1947)," NHM Library and Archives, Mss OAK Notes 8.1. See also L.S.B. Leakey and Sonia Cole, eds. *Proceedings of the Pan-African Congress on Prehistory, 1947* (Oxford: Basil Blackwell, 1952). The Congress was held from January 14-23, 1947, in Nairobi, with excursions out into the countryside to see important fossil sites, all organized by Louis Leakey. The Union of South Africa and British East Africa were especially well-represented.

[376] Louis Leakey, "Preface," *Proceedings of the Pan-African Congress on Prehistory, 1947*, iii. On chronology problems, see description in K.P. Oakley, "First Pan-African Congress on Prehistory (Nairobi, January 1947)," Mss OAK Notes 8.1 (NHM London) and Resolutions No. 14 and No. 16, in *Proceedings of the Pan-African Congress on Prehistory, 1947*, 6-8. See also L.S.B. Leakey, "Capsian or Aurignacian? Which Term Should Be Used?" talk presented January 18, 1947, in *Proceedings of the Pan-African Congress on Prehistory,* 205-206.

[377] K.P. Oakley, "First Pan-African Congress on Prehistory (Nairobi, January 1947)," Mss OAK Notes 8.1. The Companhia de Diamantes de Angola, also known as Diamang, was one of the top diamond producers in the world.

fifty-seven delegates included no less than eight directors of colonial geological surveys.[378] He also noted that "the S. African and Rhodesian delegates were transported both ways in a S. African army plane put at their disposal"—another example of state investment in geology and associated sciences.

The geologists, surveyors, professors of anatomy, and colonial functionaries who gathered at the Pan-African Congress were in the process of building—in many cases for the first time—a unified picture of the geological and biological history of eastern and southern Africa, with evidence they had gained during the normal practice of their duties or professional obligations, or through years of hobbyist excavating activity that was separate from their official employment. The outcome of their synthesis was startling. By putting together climatological and geological evidence, archaeological discoveries, and new analyses of fossilized apes and "man-like apes" from East and South Africa, the Congress participants arrived at a radically new picture of the evolutionary origins of humanity—one that ran counter to standing scientific theories that located those origins in Asia. As one Congress participant wrote in a report for his colleagues in London: "Does the available evidence indicate that *Homo sapiens* first appeared in Africa rather than in Asia? … In my personal view, yes."[379]

Compared to the material that was leveraged in support of an Asian origins hypothesis in the nineteenth century, the body of evidence that formed the basis of the African origins hypothesis of the mid-twentieth century was narrow but deep. The African origins hypothesis was built on a foundation of physical evidence drawn from paleontology, geology, and archaeology, compared to the wide-ranging analysis of linguistic, cultural, and racial relations

[378] Specifically: Tanganyika, Uganda, Bechuanaland, Anglo-Egyptian Sudan, Portuguese East Africa, the Belgian Congo, and the Union of South Africa (technically not a colony, but the point stands). See K.P. Oakley, "First Pan-African Congress on Prehistory (Nairobi, January 1947)," Mss OAK Notes 8.1.
[379] K.P. Oakley, "The Origin of Man," 1. Undated but probably April 1947. Mss OAK Notes 8.1.

that had provided support for the Asian origins hypothesis. By the mid-twentieth century, the average paleoanthropologist did not view philological analysis as a reasonable method for tracing the origin of the human species: instead, rocks, bones, and artifacts were the main articles on which evolutionary hypotheses were built. This shift in what counted as acceptable evidence was apparent in both the Asian and African research fields, although in the Asian case, researchers continued to use older cultural traditions to shore up the fragmentary material evidence and provide scientific (and financial) justification for their ongoing regional hunt for the ancestors of humanity. As American archaeologist Robert Braidwood wrote in a 1947 review, paleontology had been the main source of "such little direct evidence of an Asiatic center of human origin as does exist," but the theories that guided the discovery of this sparse fossil evidence had their origins in the broader European intellectual milieu of the eighteenth and nineteenth centuries.[380]

The traditional narrative of the history of paleoanthropology in Africa has focused on individual fossils and their discoverers.[381] Key characters include Raymond Dart, an Australian-born, British-educated anatomist who taught at the University of the Witswatersrand (commonly referred to as Wits) in South Africa and published the first description of a fossil "man-ape" he named *Australopithecus africanus* in 1925, as well as Robert Broom, a Scottish-born physician in South Africa who collected other specimens of *Australopithecus* in the 1930s, publishing his

[380] Robert J. Braidwood, "Asiatic Prehistory and the Origin of Man," *Journal of Near Eastern Studies* 6, no. 1 (January 1947), 30-31.

[381] Many (although not all) of these works have been written by scientists or journalists, rather than historians of science. Examples include Ian Tattersall, *The Strange Case of the Rickety Cossack and Other Cautionary Tales from Human Evolution* (New York: Palgrave Macmillan, 2015); Roger Lewin, *Bones of Contention: Controversies in the Search for Human Origins*, 2nd ed., with a new afterword (Chicago: University of Chicago Press, 1997); Lydia Pyne, *Seven Skeletons: The Evolution of the World's Most Famous Human Fossils* (New York: Viking, 2016).

comprehensive study *The South African Fossil Ape-Men* in 1946.[382] In East Africa, histories of paleoanthropology have focused on Louis Leakey, the Cambridge-educated and Kenya-born son of Anglican missionaries, who returned to his home colony in the late 1920s to embark on a nearly four decade-long career unlocking the secrets of human evolution.[383] In part, this emphasis on Leakey, Dart, and their fossils derived from the many years of work that both men did to shape the narratives of the discovery of humanity's African origins and to cast themselves in central roles.[384] However, the attention paid solely to specific fossil finds had an effect of naturalizing their acceptance and making their interpretation as pieces of the hominin evolutionary puzzle seem straightforward, when the historical record shows that this was far from the case. Likewise, although I do not disagree about the relevance of the modern

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[382] Raymond A. Dart, "*Australopithecus africanus*: The Man-Ape of South Africa," *Nature* 115, no. 2884 (February 7, 1925), 195-199; and R. Broom and G.W.H. Schepers, *The South African Fossil Ape-Men, The Australopithecinae*, Transvaal Museum Memoir No. 2 (Pretoria: The Transvaal Museum, 1946). Dart's first *Australopithecus* was colloquially known as the Taungs Baby, since it was a juvenile fossil skull discovered in a limestone mine near Taungs, South Africa. The final 's' in Taungs is intermittently dropped in the international press; in this chapter, I've preferred to use "Taungs" since that was the spelling used by the South African scholars in their publications and correspondence. On Dart and Broom, and their respective places in South African science and the transnational networks of British imperial anatomy, see Christa Kuljian, *Darwin's Hunch: Science, Race, and the Search for Human Origins* (Johannesburg: Jacana Media, 2016); Ross Jones and Warwick Anderson, "Wandering anatomists and itinerant anthropologists: the antipodean sciences of race in Britain between the wars," *British Journal for the History of Science* 41, no. 1 (March 2015), 1-16; Saul Dubow, "Human Origins, Race Typology and the Other Raymond Dart," *African Studies* 55, no. 1 (1996), 1-30; Saul Dubow, *Scientific Racism in Modern South Africa* (New York: Cambridge University Press, 1995); and Robin Derricourt, "The Enigma of Raymond Dart," *The International Journal of African Historical Studies* 42, no. 2 (2009), 257-282.

[383] On Louis Leakey, see Virginia Morell, *Ancestral Passions: the Leakey Family and the Quest for Humankind's Beginnings* (New York: Simon and Schuster, 1995); Sonia Cole, *Leakey's Luck: The Life of Louis Seymour Bazett Leakey, 1903-1972* (New York: Harcourt Brace Jovanovich, 1975); and Martin Meredith's *Born in Africa: The Quest for the Origins of Human Life* (New York: Public Affairs, 2011).

[384] See Louis Leakey, *By the Evidence: Memoirs, 1932-1951* (New York: Harcourt Brace Jovanovich, 1974); Louis Leakey, *The Progress and Evolution of Man in Africa* (London: Oxford University Press, 1961); L.S.B. Leakey and Vanne Morris Goodall, *Unveiling Man's Origins: Ten Decades of Thought about Human Evolution* (Cambridge, MA: Schenkman Publishing Co., 1969); Raymond A. Dart, ed. *Africa's Place in the Human Story* (Cape Town?: South African Broadcasting Corporation, 1953); and Raymond Dart with Dennis Craig, *Adventures with the Missing Link* (New York: Harper & Brothers, 1959).

evolutionary synthesis in shaping the interpretation of the Australopithecines as part of the human evolutionary lineage, this shift is not sufficient to explain the complete reorientation of prevailing evolutionary narratives towards Africa.[385] That story also does little to explain how these fossils were found in the first place—what were the conditions of discovery, the intellectual frameworks, and the physical infrastructure that made their unearthing, their analysis, and their validation possible?

In the hunt for the "missing link" in the late nineteenth and early twentieth century, the Asian origins theory (or theories, since the hypotheses of individual scientists differed in their details) determined where and how money was spent. An expedition was a good investment only if it seemed to have a reasonable chance at finding something of evolutionary significance—meaning that an expedition was almost certainly going to be headed to Asia. In lieu of a theory that supported the importance of their field sites, how then can we understand the prehistoric and paleoanthropological work that took place in Africa in the 1920s and 1930s?

Geological and archaeological data was central to the consolidation of the African origins hypothesis. These forms of contextual evidence were critical for swinging international scientific opinion towards viewing Africa as a plausible location for the evolutionary origin of humankind.

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[385] See Peter Bowler, *Theories of Human Evolution: A Century of Debate, 1844-1944* (Baltimore: Johns Hopkins University Press, 1986) and Ian Tattersall, *The Strange Case of the Rickety Cossack and Other Cautionary Tales from Human Evolution* (New York: Palgrave Macmillan, 2015). The synthesis combined Mendelian genetics with Darwinian natural selection, resulting in a population-based model of evolutionary change and the emergence of new species. On the modern synthesis (also sometimes referred to as the neo-Darwinian synthesis), see Vassiliki Betty Smocovitis, *Unifying Biology: The Evolutionary Synthesis and Evolutionary Biology* (Princeton: Princeton University Press, 1996), as well as Peter J. Bowler, *Evolution: The History of an Idea* (Berkeley: University of California Press, 1989) and Marianne Sommer, *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2016). The history of the modern synthesis is very heavily focused in the United States, whereas the story I describe that culminates in the Pan-African Congress of 1947 is very British and British empire, and took place a few years earlier; Tattersall, for instance, emphasizes the 1950 Cold Spring Harbor symposium on the origin and evolution of man as a critical site for the evolutionary reconsideration of the Australopithecines.

This pivot required scientists to integrate evidence from field sites in East Africa, Central Africa, and South Africa, most of which had been produced and considered in isolation until the Pan-African Congress in 1947 brought these practitioners together in one place to pool their data and their ideas. Above all, this work was undergirded by systematic geological surveying—most of which was economic in nature, and driven by the expansion of European colonial power in Africa. The geological surveys and the mining industry also provided training and regional employment opportunities for prehistoric hobbyists, who often chose to hunt for artifacts, map fossiliferous deposits, or create sketch copies of ancient rock art during their off-duty leave. In short, the emergence of "out of Africa" was made possible by imperialism and the necessity of developing an export-oriented colonial economy.

This geological history provides the backdrop for the paleoanthropological work of Leakey in Kenya and Tanzania, and of Dart and Broom in South Africa. Rather than focusing on these men and their discoveries, I consider their work and their professional credibility from the perspective of the British scientific elites from whom they sought validation for their discoveries and theories. Critically, Leakey, Dart, and Broom were not especially dependent on large sums of money from private donors to underwrite their fossil explorations (although Leakey was much more contingently employed than his South African counterparts and did need to seek small grants to underwrite his work and living expenses). It took far less money to undertake a "backyard" expedition to a nearby outcropping or series of caves, especially for individuals who were familiar with the terrain and were part of local colonial networks. Nonetheless, professional support and credit was not forthcoming for many years until some of their major claims had been shown to be supported by evidence gathered by other researchers—evidence that also

compensated for critical procedural errors committed by both Leakey and Dart during their excavation work.

I conclude by looking at the unification of the South African and East African evidence, and the rise of a "pan-African" thesis on human origins, beginning with British anatomist Wilfrid Le Gros Clark and his trip to South Africa to examine the Australopithecines in December 1946. From South Africa, Le Gros Clark traveled next to the Pan-African Congress in January 1947, where after conducting further close study of Leakey's Miocene *Proconsul* specimens, he took the podium to present a compelling case for reconsidering the Australopithecines not merely as a strange prehistoric ape, but as a hominin ancestor. However, as the reflections of Congress attendees make clear, the placement of *Australopithecus* on the human family tree (although not in direct ancestral relationship) was made possible by the much larger body of work that illuminated the long geological history of eastern and southern Africa, and by studies that showed how to chronologically correlate African discoveries with climate shifts and geological periods in other parts of the world. The shifting of the "garden of Eden" to Africa in the late 1940s drew on evidence from multiple parts of the African continent and provided examples of multiple stages of hominin evolutionary development. *Australopithecus* alone could not shift scientific opinion to privilege Africa above Asia (or any other location); it was a one piece of a much larger puzzle.

Colonial Geology and Prehistoric Man

In South Africa, the expansion of gold and diamond mining industries created conditions that favored the training and employment of experts in the earth sciences, which led to the production of more basic knowledge about the geological history of the region—especially in the

1920s and 1930s, when the South African mining industry saw significant growth.[386] The first *Australopithecus* fossil was unearthed in a chunk of limestone breccia discovered at the Taungs limeworks, while Broom's first Australopithecine in 1936 was similarly found in a limestone quarry at Sterkfontein.[387] Mining work frequently endangers fossil specimens—it destroyed any evidence of geological context in the case of the two Australopithecine specimens—but it also explains how these fossils could have been discovered in a place where no one was looking for evidence of the ancestors of humankind. South Africa was a regional and international mining powerhouse—the Boer War was fought in part over control of the gold and diamond mines in the Witwatersrand.[388] The South African emphasis on industrial development and mining could be overwhelming. One British prehistorian quoted a South African geologist as saying that "if he went out into the open country and stated that he was interested in its geology, he was thought to be mad, and in self-defense had to tell everybody that he was busy prospecting!"[389]

Far beyond the low likelihood of finding a hominin fossil in the diggings, though, the regional history of mining and industrial development drove the growth of a large body of geological and archaeological study in the region that provided contextual evidence that made

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[386] More precisely: South Africa in the 1920s saw moderate but steady economic growth, which took a dip in 1929 with the beginning of the Great Depression. The country then rocketed out of the Depression in 1933 when the South African state authorized a decision to float the value of the South African pound independent of the value of gold, which led to an increase in the value of gold and a mining boom. See Bill Freund, "South Africa: The Union Years, 1910-1948—Political and Economic Foundations," *The Cambridge History of South Africa*, vol. 2 (New York: Cambridge University Press, 2011), 211-253.
[387] On limestone production in South Africa, see: The Department of Mines and Industries, in collaboration with The South African Railways and Harbors Administration, *Industrial Development in South Africa* (Pretoria: The Government Printing and Stationery Office, 1927), especially the photograph of the Northern Lime Works at Taungs, facing page 176. See also discussion in Union of South Africa Geological Survey, *The Mineral Resources of the Union of South Africa, With a Summary of the Mineral Resources of South West Africa* (Pretoria: The Government Printer, 1936).
[388] See Martin Meredith, *Diamonds, Gold, and War: The British, the Boers, and the Making of South Africa* (New York: Public Affairs, 2007).
[389] Miles C. Burkitt, *South Africa's Past in Stone and Paint* (Cambridge: Cambridge University Press, 1928), 21. On the relationship between geology, prehistory, empire, and missionary work in southern Africa, see also Neville Jones, *The Stone Age in Rhodesia* (London: Oxford University Press, 1926).

the hominin fossils legible and plausible. Alex Du Toit's landmark 1926 textbook *The Geology of South Africa* makes these connections particularly apparent.[390] The main body of the work began with an overview of the physical geography and geology of the southern portion of Africa before turning to a detailed examination of the stratigraphy and major geological phenomena that had shaped the South African landscape. The final four chapters were thematic, dealing with soil sciences ("no apology is needed in this agricultural country," wrote Du Toit of his decision to include the topic), economic geology, the history of Primitive Man, and the geological history of South Africa.[391] South Africa also played host to the International Geological Congress in 1929, which made Du Toit's publication especially timely.[392]

The geological surveys of Uganda, Tanganyika (Tanzania), and Kenya likewise played important roles in the economic development of the British East African colonies—and in the scientific development of the critical mass of geological and archaeological knowledge that contextualized and justified later conclusions about the role of Africa in the evolution of the human species. Members of the geological surveys consulted on proposed paths for road and rail systems, identified valuable mineral and ore deposits, and studied the distribution of ground water, which was essential for agricultural development. In so doing, they also accumulated an intimate and detailed knowledge of the region's landscape, cultural strata, and geological history. Incidentally, they also acquired archaeological artifacts or fossils that were profoundly fascinating, and which, in conjunction with the associated evidence of East Africa's complex geological history, suggested a longer and stranger story of regional human occupation and activity than had previously been suspected.

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[390] Alex. L. Du Toit, *The Geology of South Africa* (Edinburgh: Oliver and Boyd, 1926).
[391] Du Toit, "Preface," *Geology of South Africa*, v.
[392] G.W.T., review of *The Geology of South Africa* by A.L. Du Toit, *Science Progress in the Twentieth Century (1919-1939)* 22, no. 88 (April 1928), 721-722.

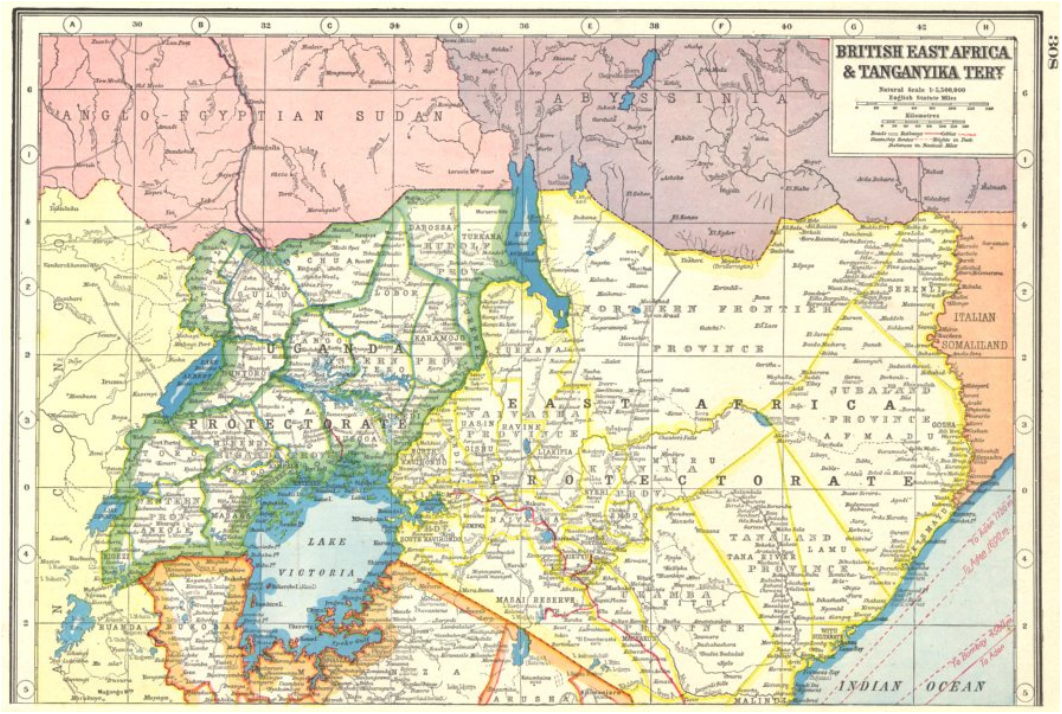


Figure 4 Map of Kenya Colony, Tanganyika Territory, and the Uganda Protectorate (1920).

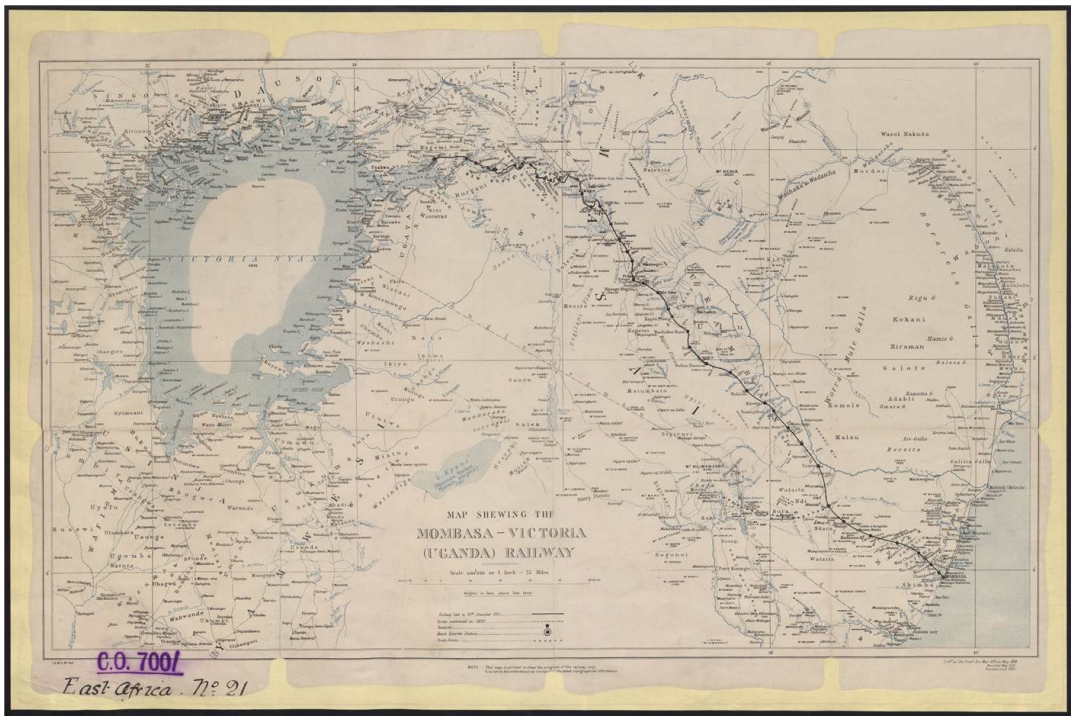


Figure 5 Map showing the Mombasa-Victoria (Uganda) Railway, 1903. (Image: UK National Archives)

In 1939, geologist E.J. Wayland, the director of the Ugandan Geological Survey, sent several close friends and colleagues a draft outline of a new report he was writing on the status of geological and archaeological research in British East Africa.[393] Wayland was only one of many similarly placed researchers who were part of the framework of British colonial rule and society in Africa and who came to be convinced that their region had played a larger role than generally recognized in the evolutionary emergence of the human species. Bored colonial officials with an enthusiasm for prehistory might conduct their own archaeological and paleontological researches on the weekends, benefitting from their formal connections and access to excavation resources, but their work remained a casual pursuit.[394] By closely examining Wayland's research practices, intellectual frameworks, and professional relations, it becomes possible to assess how this granular, intimate, incomplete, but provocative body of knowledge of African prehistory and geology was produced.

Educated in Britain in the late nineteenth century, Wayland had worked as a mining engineer with companies in Mozambique, Egypt, and Ceylon before he arrived in Uganda at the end of World War I to prospect for mineral resources in service of the future of British industrialized warfare.[395] This was supposed to be a short-term posting that would only last thirty months. Instead, he stayed in his post in the protectorate for over two decades, overseeing the

[393] E.J. Wayland, "Confidential: Chart of Central and East African Prehistory," typescript. Geological Survey Office, Entebbe, Uganda, 1939. Miles Crawford Burkitt papers, GBR/0012/MS Add.7959, box 4. Cambridge University Library.
[394] See, for example, Burkitt's correspondence with Phil and Alma Glover on prehistoric rock art in British Somaliland, c. 1930s-40s. Miles Crawford Burkitt papers, GBR/0012/MS Add.7959, box 2. Cambridge University Library.
[395] E.J. Wayland, "Summary of Progress of the Geological Survey of Uganda for the Years 1919 to 1929," Uganda Protectorate (Entebbe: Government Printer, 1931), 1-2. For Wayland's brief biography, see his entry in the British Museum's collection database: http://www.britishmuseum.org/research/search_the_collection_database/term_details.aspx?bioId=34392

growth of the geological survey from a single Geological Expert tucked in the back of the Colonial Land Office to a multi-person staff with a dedicated research laboratory.

Wayland's professional responsibilities were significant – large amounts of Uganda had not been surveyed (even after a decade of work, his office reported that they had mapped only about 2700 square miles out of the 92,000 square miles of the Ugandan Protectorate), and the colonial government continued to put pressure on him to identify deposits of mineral resources that were accessible and plentiful enough to be worth exploitation. The expansion of the railway from Mombasa on the coast of Kenya to the region around Lake Victoria meant that minerals could be more easily exported—but also that it would be extremely helpful if coal fields could be developed in or around the Ugandan terminus. The Geological Survey's other pre-occupation was water—"the commonest and most intrinsically valuable mineral in the world," as Wayland described it in a government progress report in 1929—since it was commonly believed that the region was drying up, with naturally occurring springs and wells becoming smaller in number and more difficult to access.[396] This was a critical concern for colonial governments in both Uganda and neighboring Kenya, where white settler agriculture was a significant sector of the colonial economy.[397] In Uganda, the colonial government had pushed Ugandan farmers to replace their local food crops with cash crops for export, with cotton—lightweight, easily exported, and intensely water-dependent—being the export crop of choice.[398]

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[396] Both Wayland and Wilfrid Le Gros Clark made off-hand references to this belief in their reports and letters, and many South African geological publications also make similar quick remarks. Diana K. Davis has described a similar colonial discourse of desertification in the Mahgreb; see Diana K. Davis, *Resurrecting the Granary of Rome: Environmental History and French Colonial Expansion in North Africa* (Athens: Ohio University Press, 2007).

[397] On agriculture and settler colonial rule in East Africa, see Dane Kennedy, *Islands of White: Settler Society and Culture in Kenya and Southern Rhodesia, 1890-1939* (Durham: Duke University Press, 1987).

[398] On colonial agriculture projects in Uganda, see Grace Carswell, "Food Crops as Cash Crops: The Case of Colonial Kigezi, Uganda," *Journal of Agrarian Change* 3, no. 4 (October 2003), 521-551; and E.A.

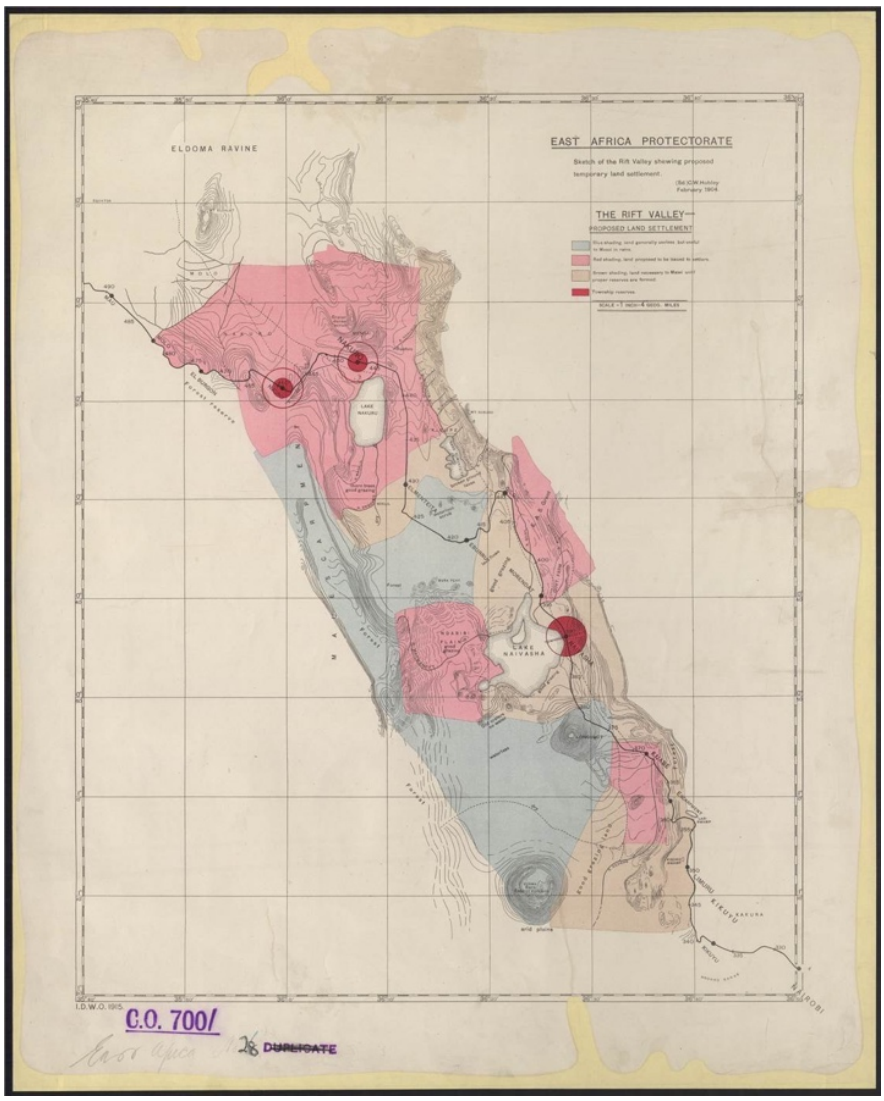


Figure 6 Charles Hobley, "East Africa Protectorate -- Sketch of the Rift Valley, showing proposed temporary land settlement," 1904. UK National Archives.

By 1939, Wayland had been working on hydrological and geological problems in Uganda for twenty years. He had surveyed some 900 square miles of the country on foot, and a further 300 by canoe. He had also consulted on a large number of building projects, including surveying sites for roads, bridges, and rail lines. But while pursuing these duties, he also kept coming

Brett, *Colonialism and Underdevelopment in East Africa: The Politics of Economic Change 1919-1939* (London: Heinemann, 1973).

across two strange things. One was that the Ugandan landscape was marked by a dramatic history of rising and falling water. There was evidence of lakes that had once been much larger and deeper, rivers that had reversed their direction of flow and then gone back again, and evidence that Uganda's past climate had oscillated between wet and dry periods over a long span of geological history.

> "When the writer first came to this country (January 1919)," Wayland began in 1939:
>
> …the Protectorate was for all practical purposes *terra incognita*, geologically speaking. Not least among the many problems that presented themselves was that provided by the presence of a lake as big as Ireland (the Victoria Nyanza, the second largest lake in the world) perched on a plateau nearly 4,000 feet above the sea."[399]

Lake Victoria—usually referred to as Victoria Nyanza, to differentiate the East African body of water from all the many other Lakes Victoria populating the British empire—had once been much, much larger, with evidence of lakebed deposits 100 feet above the current shoreline. Furthermore, this larger lake had apparently been visited by humans, since worked stone tools had been found in the strata that marked the ancient high-water marks. However, anthropologists and other scholars had long assumed that humans had arrived in the regions south of the Sahara only very recently, meaning that stories of a much larger lake would have had to have survived in the local tradition—and none could be found to exist. (Wayland commented in a footnote: "Indeed, what tradition there is runs to the contrary.")

This was the second strange thing that Wayland had noticed and highlighted in his 1939 report. Not only were there simple stone tools preserved in the gravel strata of historical beaches that were now over a hundred feet above the water line, but there were there were stone tools all over Uganda, both of types that were known to exist in other parts of the continent and in

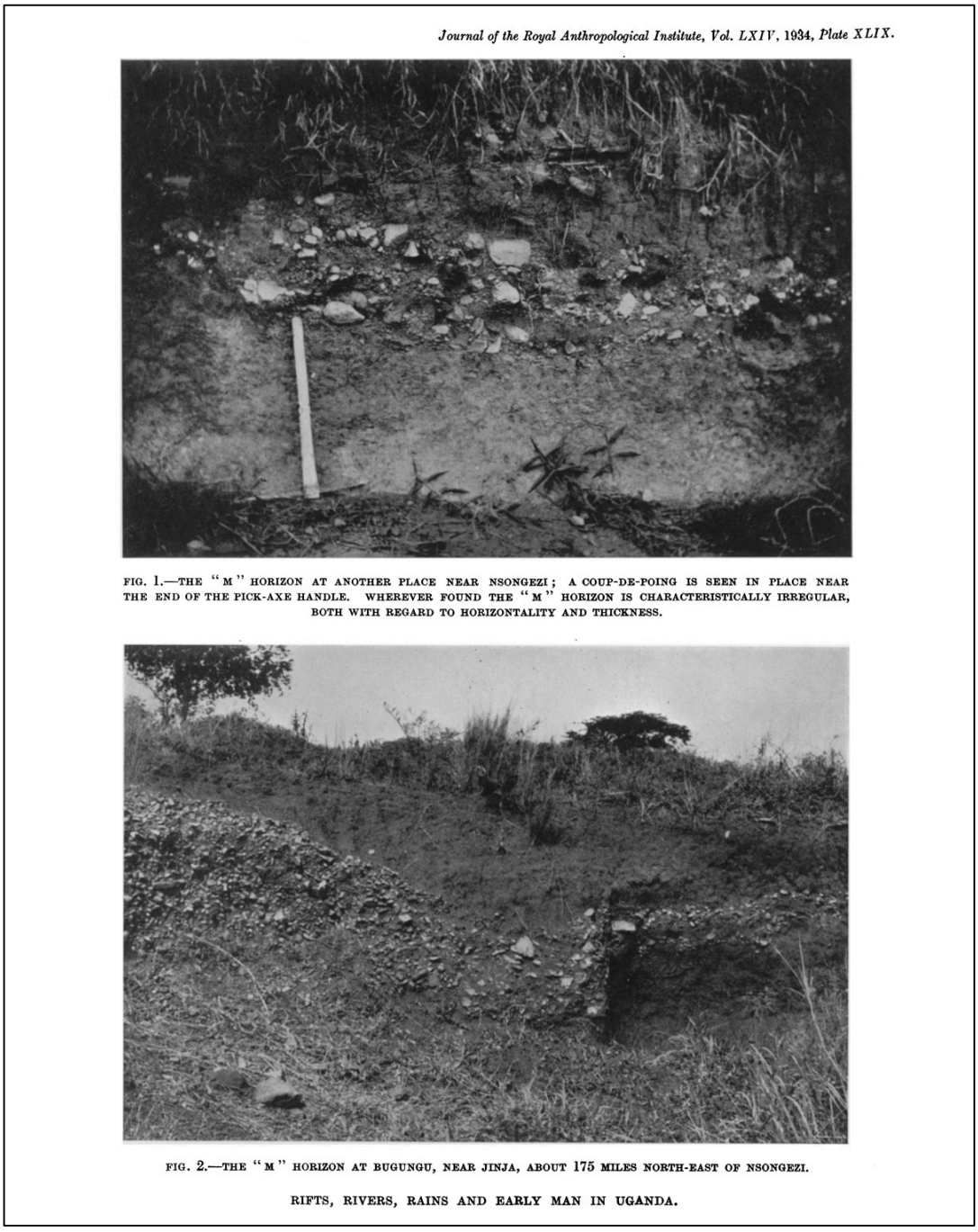
[399] Wayland, "Confidential: Chart of Central and East African Prehistory," 1.

Europe, but also amazingly consistent examples of small broken stones all over the country that seemed too deliberately formed to be accidental or naturally occurring. In fact, they vaguely resembled the first step towards making worked stone tools. Also, Wayland consistently found these "pebble-tools" in strata that he guessed dated back to at least the Pleistocene era. Coupled with new data gained on the history of the region's geological formations, including the East African Rift zone, Wayland believed his work suggested startling new conclusions about the long history of human settlement and cultural activity in Africa. He wrote:

> Stone Age Man first appeared in Uganda an almost incredibly long time back, at least as far back it seemed as the then known earliest records of his presence in Europe. The history of the equatorial lakes (in part at any rate) and the history of Man in the heart of Africa, were, it seemed, bound in the same volume.[400]

When Wayland had arrived in Uganda in 1919, he was quickly told by two different people (who he wrote "one would have thought were sufficiently responsible" and knowledgeable) that there were no prehistoric stone tools in Uganda. "Within a few days of my arrival in the country," he wrote in 1934, "I had collected many."[401] The most interesting of these was a series of extremely simple "pebble-tools" which Wayland first encountered in a site in the Kafu Valley, in Bunyoro,

[400] Wayland, "Confidential: Chart of Central and East African Prehistory," 1-2.
[401] E.J. Wayland, "Rifts, Rivers, Rains and Early Man in Uganda," *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 64 (Jul.-Dec. 1934), 334.



Journal of the Royal Anthropological Institute, Vol. LXIV, 1934, Plate XLIX.

FIG. 1.—THE "M" HORIZON AT ANOTHER PLACE NEAR NSONGEZI; A COUP-DE-POING IS SEEN IN PLACE NEAR THE END OF THE PICK-AXE HANDLE. WHEREVER FOUND THE "M" HORIZON IS CHARACTERISTICALLY IRREGULAR, BOTH WITH REGARD TO HORIZONTALITY AND THICKNESS.

FIG. 2.—THE "M" HORIZON AT BUGUNGU, NEAR JINJA, ABOUT 175 MILES NORTH-EAST OF NSONGEZI.

RIFTS, RIVERS, RAINS AND EARLY MAN IN UGANDA.

Figure 7 Photographs in E.J. Wayland, "Rifts, Rivers, Rains, and Early Man in Uganda," *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 64 (Jul.-Dec. 1934), figures 1 and 2.

which seemed to be a precursor to the better-known Chellean type. Wayland dubbed this type of tool the "Kafuan" type, and remained on alert for other examples. During a trip to South Africa in 1922, he found more examples of a stone tool culture in the Transvaal that resembled a more

developed Kafuan type, and then identified even more such tools in Tanganyika, Kenya, the Sudan, and in many other parts of Uganda.[402]

Wayland acknowledged that there were skeptics who read his Kafuan tools as simply pebbles that "got broken."[403] Yet he argued that the "humanity" of these implements was seldom questioned when they were put side by side with slightly more advanced types of stone tools, and secondly that there were obvious differences between these pebble tools and randomly broken pieces of gravel and rock which were observable to the trained eye. "It must be admitted that I should probably not have suspected the artificial nature of these primitive artifacts," Wayland wrote, "had it not been my long-continued practice to pay close attention to gravels from all points of view on account of their possible or actual economic importance."[404] Wayland also observed that there was a visible range in Kafuan tools, with more technically advanced types showing up in more geologically recent deposits, suggesting that the form had been developed and refined over time. Also, if the pebble tools were naturally occurring, they should show up in geologically extremely old gravels, or in rock piles that were very geologically recent—instead, they only appeared in a particular stratum of Ugandan prehistory.[405]

When Wayland considered the more refined types of stone hand-axes, he felt he could see an emergent aesthetic quality that left him, at least, in no doubt that the makers had been "not very different from ourselves."

[402] Wayland, "Rifts, Rivers," 335-336; and Wayland, "Confidential: Chart of Central and East African Prehistory," 3-4.
[403] Wayland, "Confidential: Chart of Central and East African Prehistory," 4.
[404] Wayland, "Confidential: Chart of Central and East African Prehistory," 4-5.
[405] Wayland, "Confidential: Chart of Central and East African Prehistory," 5.

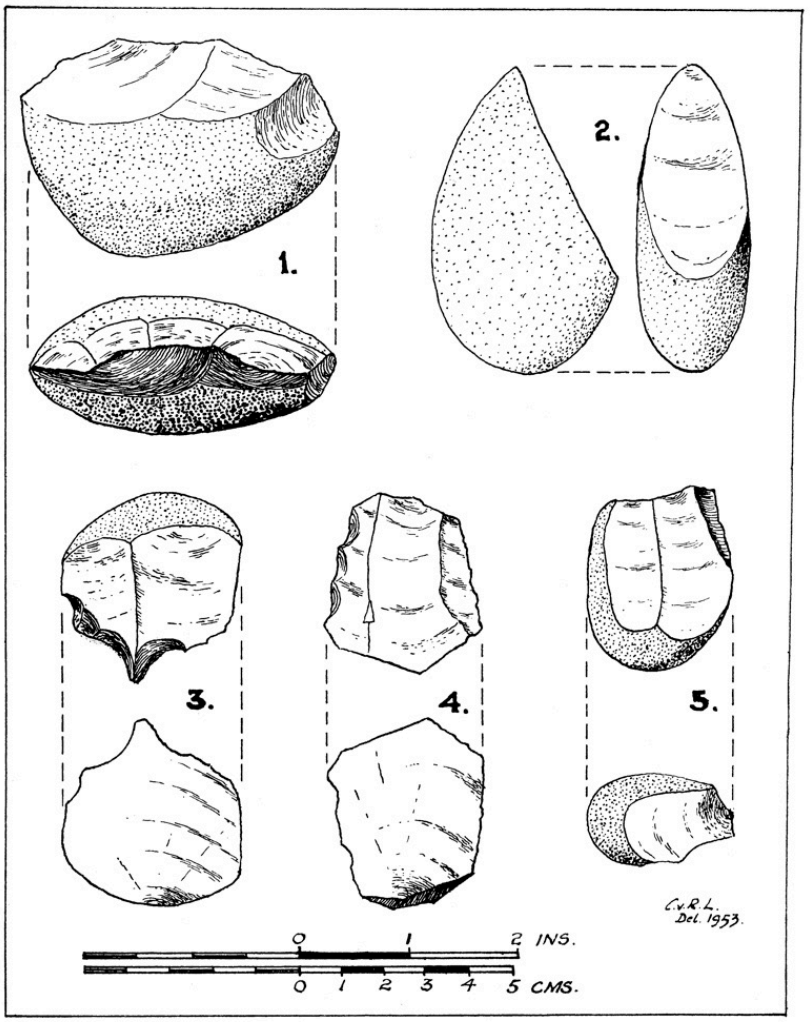


FIG 1.

type of artefact that is as likely to occur in the Oldowan as in the Kafuan. No. 2 is a typical plagiolith* or pebble artificially split *per bend*. No. 3 has every appearance of being a borer on a flake. No. 4 is a flake. No. 5 a core. All are of quartzite, and all are obviously of the same age as the deposit from which they were taken.

* Van Riet Lowe, C.: 'The Pleistocene Geology and Prehistory of Uganda: Part II, Prehistory', *Geol. Survey of Uganda, Memoir No. VI*, 1952, p. 19 *et al.*

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Figure 8 Illustration of Kafuan-type "pebble tools," in C. van Riet Lowe, "The Kafuan Culture in South Africa," *The South African Archaeological Bulletin* 8, no. 30 (June 1953), 28.

Describing Acheulean-type hand-axes unearthed in lakebed deposits around the shores of Lake Victoria, Wayland wrote:

> In beauty of symmetry and in what we must regard as prideful skill in handicraft all demands of utility, the original motif, were far surpassed; in a number of [hand-axes] we see not only tools and weapons, for over and above mere products of a mundane purpose we behold endeavor of another kind: it is that of self-expression.[406]

By way of contrast, the simplicity and directness of the earliest Kafuan tools made Wayland more likely to assign them to a "proto-Man," driven by the most basic survival urges. But by the time the later hand-axes emerged, in the middle Pleistocene, "Man had found in his makeup something better than brutish; something he was impelled to express," and this creative impulse found its way into tool work. "What else can he have been," wrote Wayland, "but *Homo sapiens*?"[407]

Wayland's aesthetic analysis aside, there were still significant challenges to putting this claim on a firm evidentiary footing—a point made by no less an authority than elite British anatomist Arthur Keith, who said in 1931 "In Uganda, Mr. Wayland has proved the existence of man from remote times, but the fortune of finding fossil remains of the men who shaped the paleoliths was denied him."[408] Wayland was quick to point out that he hadn't been *looking* for the fossil remains of prehistoric men: he had other work to do, and it wasn't worthwhile to fossil-hunt unless one were committed to doing it thoroughly and properly. Without any method of absolute dating based on chemical or radiometric analysis—whose development was still about a decade in the future—Wayland had to rely on relative dating and correlations based on similar geological phenomena or index fossils. The geological law of superposition stated that strata are

[406] Wayland, "Confidential: Chart of Central and East African Prehistory," 8.
[407] Wayland, "Confidential: Chart of Central and East African Prehistory," 8.
[408] Wayland, "Rifts, Rivers," 352.

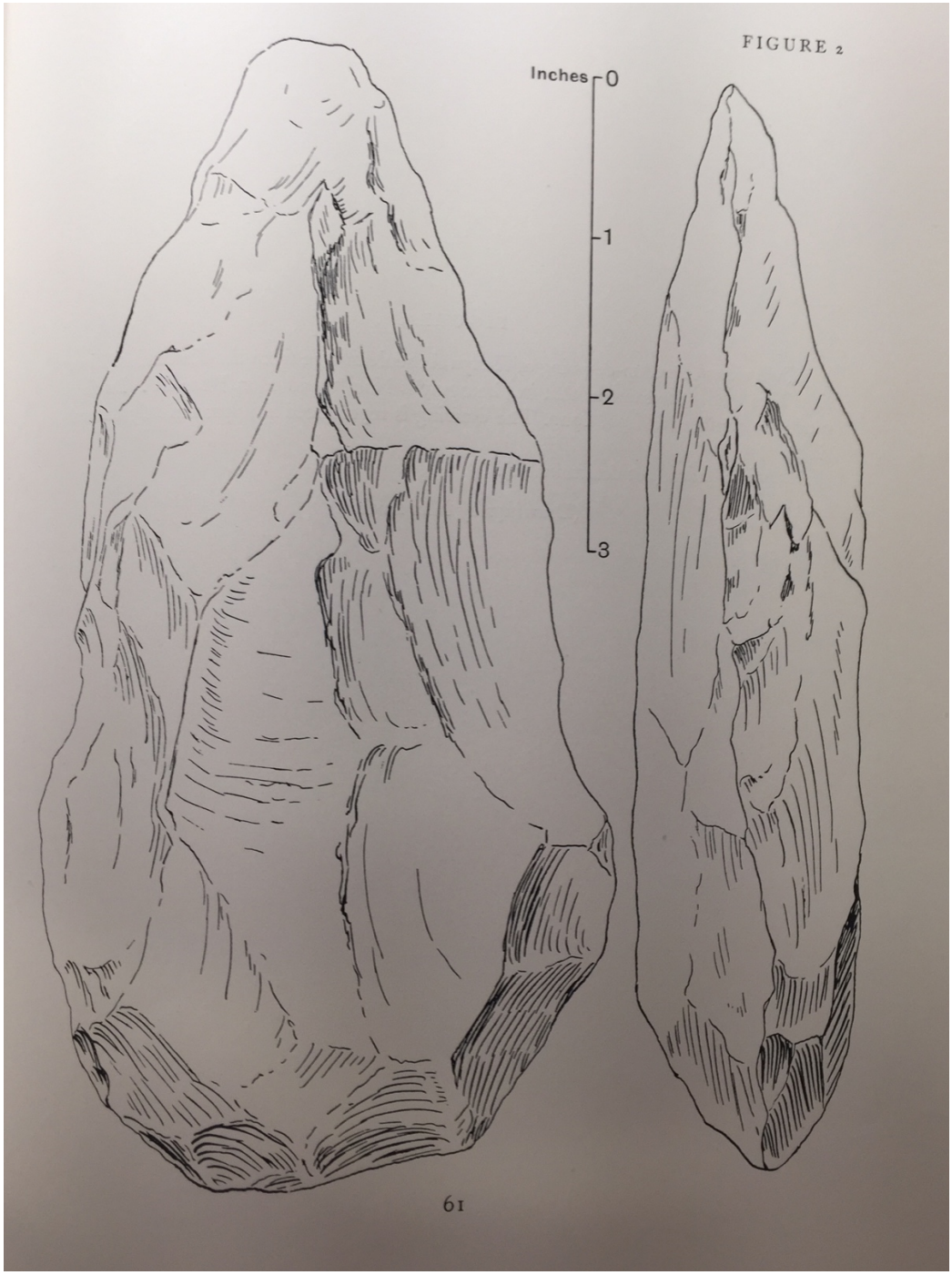


Figure 9 Upper Kenyan Chellean hand-axe, Kariandusi River – figure 2 in Leakey, *The Stone Age Cultures of Kenya Colony* (1931), 61.

laid down successively, so the lower something is located in a geological deposit, the older it is. This is generally a banal geological principle—except in the East African Rift zone, where

Wayland's geological surveying had shown him ample evidence of major faulting and other earth movements, including some changes that were so dramatic they had reversed the flow of rivers.[409]

It was not impossible to say that one tool was older than another that was closer to the surface in the same area, but the region's geological activity was both a boon and a burden—a boon because earth movement made clearly delineated strata visible and accessible, but a burden because it was difficult to ascertain whether something truly belonged in the strata in which it had been found.[410] Similarly, although many years of surveying and hydrological analysis had given Wayland excellent evidence of the historical changes in the Ugandan water-table, he couldn't prove that these changes, especially the rainy periods that he called "pluvials," corresponded with any known geological or climatological phenomenon on another continent. The most that could be said was that early Kafuan tools had been found below geological strata that were conventionally dated to the beginning of the Pleistocene period. If these tools had indeed been made by "Man" or "proto-Man," then this was a strikingly early find indeed.

Wayland's analysis of the pebble-tools was based on geologically-informed observations of their plenitude, their relationship with surrounding rock formations and rock types, and his own aesthetic judgments, both about the most basic Kafuan pebble tools and the inventive and creative impulse that he read in the later stone objects. His geological knowledge was critical to reaching these conclusions, but he was not able to build a robust correlation between climactic periods in East Africa and glaciations in the northern hemisphere that would allow him to put his finds on a trans-continental chronology, and establish that the Kafuan and the Acheulean and Chellean types found in Uganda, Kenya, Tanzania, and South Africa were actually older than the

[409] See discussion throughout Wayland, "Rifts, Rivers," 333-344.
[410] Wayland, "Confidential: Chart of Central and East African Prehistory," 9.

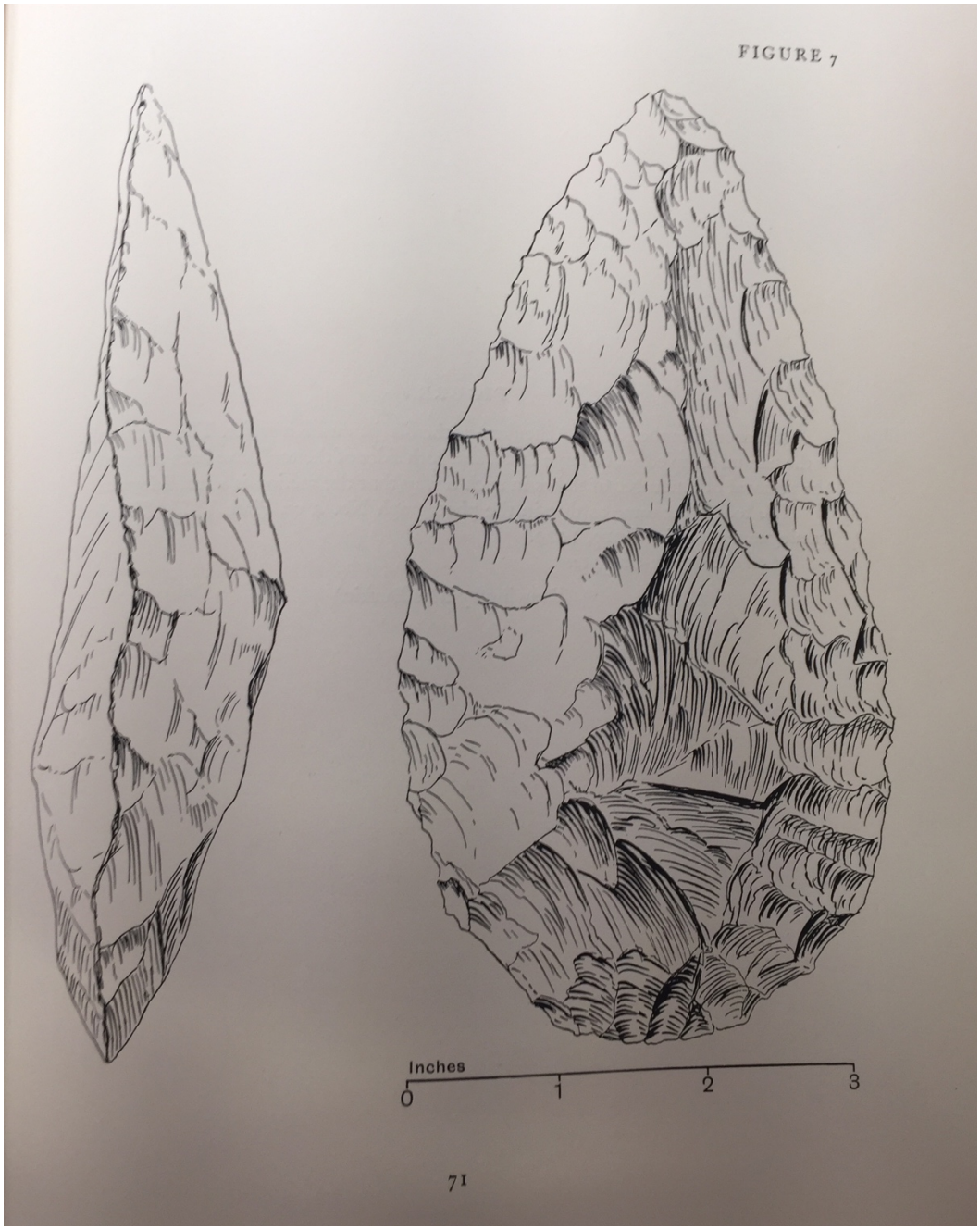


Figure 10 Obsidian hand-axe, Kenya Acheulean type, Kariandusi River -- figure 7 in Leakey, *The Stone Age Cultures of Kenya Colony* (1931), 71.

equivalent tools discovered at Acheul and Chelles in France, from which their type-names derived. Wayland had the geological context, and he had the stone artifacts that could be interpreted as evidence of human emergence, but he had no fossils to fill in the links between

these two other areas of knowledge, or to suggest what kind of human or proto-human might have made these tools. And, in 1939, Wayland was also aware that he was running out of time to make these investigations, at least for the present moment: "It is more than unfortunate," he wrote:

> …for all concerned that the war should have started when it did, or that it should have started at all. Archaeology cannot expect to matter much in war time, thus we have no grounds for complaint that our field work was immediately stopped.[411]

He concluded: "Here is the foundation, it is as sound as we, with our limitations, are able to render it; upon this others may build."[412]

Stone Age Man and the Great Rift Valley

In 1926, the *East African Standard, Mombassa Times & Uganda Argus* reported with pride on the activities of a "young man of Kenya" who had recently returned to begin serious excavation work on the Stone Age prehistory of Kenya Colony.[413] Recently graduated from Cambridge, the twenty-three-year-old Louis Leakey was the son of Anglican missionaries, and had grown up in the central highlands of Kenya.[414] Although Leakey had received some money from British scientific institutions in London, his planned expedition was on a shoestring budget, and the article's author exhorted readers to consider contributing "even some small amount to allow the research to progress even more rapidly, and in definite association with the East

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[411] Wayland, "Confidential: Chart of Central and East African Prehistory," 12.
[412] Wayland, "Confidential: Chart of Central and East African Prehistory," 12.
[413] "Archaeological Research," *The East African Standard, Mombassa Times & Uganda Argus*. Thursday, December 30, 1926. AR 4/2/2, box 116. MAA Archives, Cambridge.
[414] For a comprehensive biography (produced with the cooperation of the Leakey family), see Virginia Morell, *Ancestral Passions: the Leakey Family and the Quest for Humankind's Beginnings* (New York: Simon and Schuster, 1995). Leakey also glosses this period in his life in his *By the Evidence: Memoirs, 1932-1951* (New York: Harcourt Brace Jovanovich, 1974), as a sort of prelude to the "proper" beginning of his paleoanthropological work in the 1930s.

African community."[415] The areas Leakey hoped to visit included the region surrounding Lake Nakuru and the south-west side of Victoria Nyanza in Kenya, and Ngorogoro Crater and Oldoway (Olduvai) Gorge "in the North Centre of Tanganyika Territory."[416] His research was framed as inherently worthwhile, but in a strictly local sense: "There seems little doubt that the Stone Age persisted in Africa at a very much later date than in Europe," reported the *East African Standard*, and the archaeological material collected by the ongoing expedition:

> …will probably show that Stone Age people, driven out of Europe by succeeding waves of a more advanced civilization, crossed the land bridges then existing over the Mediterranean and carried on their life in Africa long after the conditions had ceased to exist in Europe.[417]

Before leaving for East Africa, Leakey had applied to the Royal Geographical Society to borrow some basic surveying instruments. "This is a little-known area I believe & we might have done a little," he wrote to A.R. Hinks, the Royal Geographical Society's secretary, but since Leakey's expedition was largely focused on the archaeology of "Stone Age Man" and not the geography of East Africa, his request his request for prismatic compasses, plane-tables, and a single pair of field glasses was politely denied.[418]

Leakey scraped together enough supplies and gear for a shoestring expedition and began investigating the archaeology of Kenya. In 1927, he published his first article in *Nature*, "Stone Age Man in Kenya Colony," describing ancient human skulls he had unearthed on farms near Lake Nakuru and Lake Elmenteita.[419] The skulls had been discovered in association with

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[415] "Archaeological Research," *The East African Standard, Mombassa Times & Uganda Argus*. Thursday, December 30, 1926. AR 4/2/2, box 116. MAA Archives, Cambridge.
[416] LBS Leakey to AR Hinks, August 16, 1926. RGS/CB9/97 (Royal Geographical Society, London).
[417] "Archaeological Research," *The East African Standard, Mombassa Times & Uganda Argus*. Thursday, December 30, 1926. AR 4/2/2, box 116. MAA Archives, Cambridge.
[418] See Leakey to Hinks, August 8, 1926; Hinks to Leakey, August 12, 1926; Leakey to Hinks, August 16, 1926; and Hinks to Leakey, August 19, 1926, all in RGS/CB9/97.
[419] L.S.B. Leakey, "Stone Age Man in Kenya Colony," *Nature* 120, no. 3011 (July 16, 1927), 85-86.

fragments of a flaked stone tool culture that resembled examples found elsewhere in the region, but Leakey argued that it was impossible to make any pronouncements as to the "racial or cultural affinities" of his finds. He assigned the two sets of skulls to different racial groups, and further argued that neither of those racial types were present in the contemporary peoples of Kenya.[420] Leakey doubted that other researchers would necessarily accept his claims, but also found that he didn't particularly care. As he wrote to Miles Burkitt, his former tutor in Cambridge:

> I'm not minding what the physical anthropologists say about my types. I know I've got two quite distinct types of man neither of which bears the slightest resemblance to modern negroes & both of which have characters certainly not found today in living races so far as I can tell from the books at my disposal, which are now fairly comprehensive.[421]

Leakey suspected that his Nakuru and Elmenteita "types" represented a set of much older and now vanished human populations, but he had no way of placing his skulls chronologically, since they had been discovered in shallow cave burials. The worked rock flakes and other tool fragments Leakey had unearthed were also no help, since while they had been discovered in geological deposits throughout East Africa, matching his specimens to a type and placing them on a chronological scale was essentially impossible.

In part, this was due to the geology of the region Leakey was exploring. European explorers had been fascinated by the topography of East Africa and the Horn of Africa since the late nineteenth century, when they observed that the banks of the Red Sea were nearly parallel, almost as if the earth had been split evenly apart along a seam. Subsequent surveying had shown that this split in the earth's crust continued south as a series of gorges, valleys, volcanoes, and incredibly deep and narrow lakes that ran well into the African interior. The term "rift valley"

[420] Leakey, "Stone Age Man in Kenya Colony," 85, his italics.
[421] Louis Leakey to Miles Burkitt, May 6, 1927, AR 4/2/1, box 116. MAA Archives, Cambridge.

was coined by British geologist J.W. Gregory to describe a narrow subsidence between two parallel edges that had fractured apart, after observations he made during an expedition to what was then British East Africa in 1892 and 1893.[422] There was significant disagreement, though, about how old the Rift Valley was. Austrian geologist Eduard Suess argued for the rift's relative youth, and Gregory agreed that both scientific observation and local legend supported the conclusion that the earth continued to move into new formations in the area up to the present day.[423]

[422] J.W. Gregory, *The Rift Valleys and Geology of East Africa* (London: Seeley, Service & Co., 1921), 18. For an account of the 1892-1893 expedition, see J.W. Gregory, *The Great Rift Valley: Being a Narrative of a Journey to Mount Kenya and Lake Baringo, with Some Account of the Geology, Natural History, Anthropology, and Future Prospects of British East Africa* (London: John Murray, 1896).
[423] Gregory, *The Rift Valley* (1921), 23-24. The nature of rift tectonics was also a live topic of discussion in the 1920s because of the disputes over the nature of tectonic drift; see Naomi Oreskes, *The Rejection of Continental Drift: Theory and Method in American Earth Science* (New York: Oxford University Press, 1999).

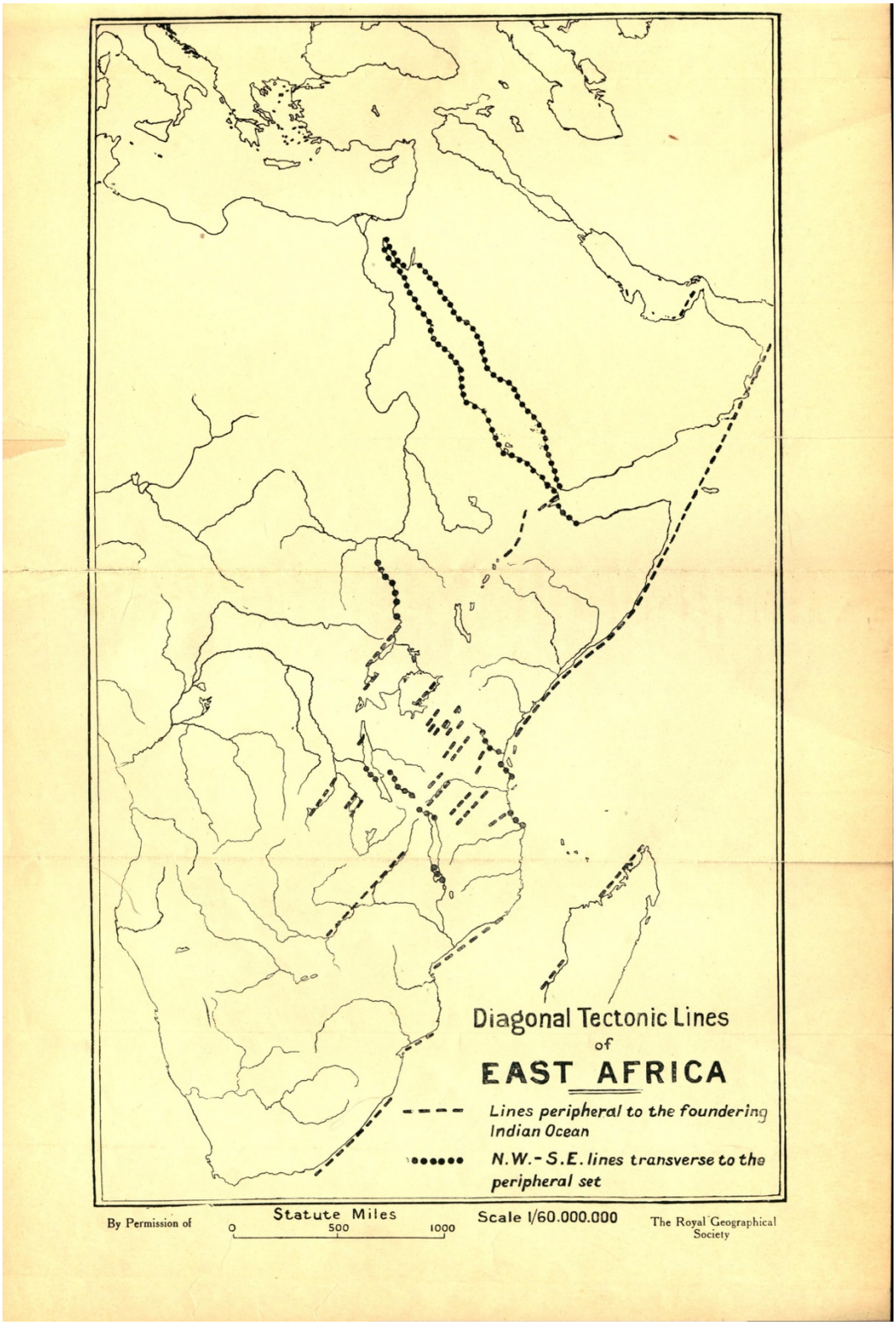


Figure 11 Map of tectonic lines of East Africa in J.W. Gregory, *The Rift Valleys and Geology of East Africa* (London: Seeley, Service & Co., 1921).

However, Gregory's analysis in the 1890s led him to conclude that sections of the rift were much, much older, dating back to the Eocene and Miocene periods; in some sections, the rift faults antedated the formation of the Alps in Europe. Gregory had also noted that stone implements, including obsidian flints and simple stone hand axes had been discovered in strata thought to be of great geological age, although if Gregory was wrong about the age of certain deposits, or the age of the rift system itself, then the tools were obviously only evidence of more recent human habitation. A report from the Geological Survey of Kenya published in 1939 highlighted Gregory's work as one of the first comprehensive analyses of the age of the different levels of the rift system, although the author questioned some of his judgments when assigning stratigraphic levels to older geological periods based on generous interpretations of the age of certain index fossils.[424]

These difficulties notwithstanding, Leakey was determined to continue excavating in both Kenya and Tanganyika (Tanzania). He began planning his Second East African Expedition in 1928, and included plans to map the regions around several of the Rift Valley lakes. "In view of the definite geographical work proposed," he wrote to the Royal Geographical Society:

> I venture to hope that the R.G.S. will be able to loan me (1) a Dumphy level (2) a Prismatic compass on tripod, and if possible I would very much like some pecuniary assistance towards the expenses on the geographical side of the Expedition.[425]

This time, his application was successful; Leakey received both the requested instruments and a contribution of £50 towards defraying the Expedition's expenses.[426] Although his

[424] H.L. Sikes, "Geological Survey of Kenya: Notes on the Geology of the Country Surrounding Nairobi," Colony and Protectorate of Kenya, Mining and Geological Department. (Nairobi: Government Printer, 1939), 6-7.
[425] Leakey to Hinks, May 2, 1928. (RGS/CB9/97)
[426] Hinks to Leakey, May 7, 1928. (RGS/CB9/97)

anthropological claims had not gained much traction, Leakey's archaeological work appeared promising enough that the Rhodes Trust was also willing to contribute money to support further research.

By the mid-1930s, however, Leakey was struggling to maintain his credibility in the eyes of the British scientific establishment. In 1931, he had joined German paleontologist Hans Reck to re-examine Olduvai Gorge in Tanganyika. In 1913, when Tanganyika was still German East Africa, Reck had led an expedition to Olduvai, making preliminary studies of the five clearly-delineated strata that could be observed in the side of the gorge. In the second lowest (and therefore second oldest) layer, Reck and his team had discovered a fossilized skeleton that appeared to be an example of *Homo sapiens*, although it lay side-by-side with fossilized fauna that were usually assigned to the early Pleistocene period, which seemed astonishingly early for a fully modern *Homo sapiens* to appear. Tanganyika had been a prime site for German volcanologists and paleontologists to make observations and gather fossils, and as a result it was also more extensively mapped and better understood geologically than either Kenya or Uganda, at least by 1931.[427] Reck brought "Oldoway Man" with him to Germany in 1914, although he had little time to examine the fossil before he returned to East Africa immediately before the outbreak of the First World War. He was interned as a POW in 1916; by the end of the war, the British were in control of German East Africa, and Reck turned instead to an intensive study of Santorini and island volcano formation in the 1920s, as well as writing up an analysis of the

[427] J.W. Gregory ascribed this to the combination of a milder climate and more accessible interior, as well as the fact that German East Africa had been the pride of the much smaller German overseas empire—the British simply couldn't spare as much time for surveying Kenya and Uganda as they might have wished, given there were so many other territories to pay attention to. See Gregory, *The Rift Valley* (1921), 272-273. On the dynamics of German overseas empire, see Sebastian Conrad, *Globalization and the Nation in Imperial Germany*, trans. Sorcha O'Hagan (New York: Cambridge University Press, 2010).

dinosaur fossils he had found in German East Africa before the war.[428] Leakey had visited Reck in Munich in 1928 to examine the Oldoway *Homo sapiens* with an eye to comparing Reck's specimen to his own type examples from Elmenteita and Nakuru.[429] Leakey reported in a letter to *Nature* that his Munich trip had confirmed for him that the Elmenteita and Olduvai skulls represented the same or closely affiliated racial types, and further that Reck's collections of fossilized fauna from the strata above and below the *Homo sapiens*-bearing strata supported placing the fossil in the early Pleistocene. Furthermore, Leakey wrote, "I could see no sign at all of the suggested artificial chipping of the teeth," a regional cultural practice associated with the Makonde people, which would support the conclusion that the skull was a recent burial that had intruded into much older deposits. However, Leakey had only been able to examine the upper jaw, "as Dr. Mollison was away from Munich at the time of my visit and the lower jaw was locked up in his room."[430] Nevertheless, Leakey felt that Reck's 1913 find confirmed the conclusions he had drawn from his own Elmenteita and Nakuru finds:

> …it indeed looks as though an early form of *Homo sapiens* lived in East Africa before the last pluvial period, accompanied by numerous animals now extinct.[431]

The 1931 expedition to Olduvai with Leakey was Reck's first opportunity to return to the site and re-examine Olduvai in hopes of determining the approximate age of the second lowest stratum. Together with British paleontologist Arthur T. Hopwood, Leakey and Reck concluded that the human fossil belonged to bed II, and not in a patch of the (younger and higher-up) bed

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[428] For dinosaurs, see Hans Reck, *Grabungen auf Fossile Wirbeltiere in Deutsch-Ostafrika* (Berlin: Verlag von Gebrüder Bornträger, 1925). For volcanoes, see Hans Reck, *Santorin: der Werdegang eines Inselvulkans und sein Ausbruch, 1925-1928* (Berlin: D. Reimer, Andrews & Steiner, 1936). Reck successfully explored Olduvai again in 1931 in the company of Louis Leakey, and described his study of both Olduvai and the human fossil in *Oldoway, die Schlucht des Urmenschen: die Entdeckung des altsteinzeitlichen Menschen in Deutsch-Ostafrika* (Leipzig: F.A. Brockhaus, 1933).
[429] L.S.B. Leakey, "Letter: The Oldoway Skull," *Nature* 121, no. 3048 (March 31, 1928), 499-500
[430] Leakey, "The Oldoway Skull," 500.
[431] Leakey, "The Oldoway Skull," 500.

IV that had shifted downwards and intruded into the bed II layers.[432] Bed I contained two stone flakes that looked like they might have been deliberately shaped; Beds III and IV, though, held many examples of the well-known types of tools. Leakey had seen similar tools in strata in Kenya, which he assigned to the "Kamasian" culture, although none of the Kenyan tools had been found in association with fossils, he declared the Olduvai fossil deposits to be from the upper Kamasian period.[433] "This correlation is borne out," the article concluded,

> by the fact that the Oldoway beds, like the typical Kamasian series in Kenya, are older than the period of volcanic activity and rift faulting, which was responsible in Kenya for the Gilgil and Kikuyu Escarpments and the volcanic mountains, such as Longonot, Suswa, etc., and in Tanganyika Territory for the Ngorongoro volcanic highlands and the escarpment which cuts them to the east.[434]

However, while Leakey, Reck, and Hopwood wanted to use the region's history of geological upheaval as a temporal indicator and site correlation benchmark, other researchers lacked the trio's confidence that these movements of the earth had not also shifted Oldoway Man around and deposited him in an older stratum, an unwitting participant in posthumous earthquake-induced time traveling.

After an extended (mostly cordial) series of exchanges in *Nature* with paleontologists D.M.S. Watson and C. Forster Cooper, Leakey conceded that Oldoway Man was more likely to have been an intrusive burial, although he thought he might have been buried by other humans in Olduvai bed II during the period when bed III was being laid down.[435] Leakey had returned to

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[432] L.S.B. Leakey, Hans Reck, and Arthur T. Hopwood, "Letter: Age of the Oldoway Bone Beds, Tanganyika Territory," *Nature* 128, no. 3234 (October 24, 1931), 724.
[433] Leakey et al., "Age of the Oldoway Beds," 724.
[434] Leakey et al., "Age of the Oldoway Beds," 724.
[435] C. Forster Cooper and D.M.S. Watson, "The Oldoway Human Skeleton," *Nature* 129, no. 3252 (February 27, 1932), 312-313; L.S.B. Leakey, "The Oldoway Human Skeleton," *Nature* 129, no 3263 (May 14, 1932), 721-722; C. Forster Cooper and D.M.S. Watson, "The Oldoway Human Skeleton," *Nature* 129, no. 3268 (June 18, 1932), 903.

England from Kenya at the end of 1932, bringing with him rock samples from beds II, III, and IV at Olduvai, taken from points both near to the "man site" and from other locations up and down the length of the gorge.[436] The samples were presented to J.D. Solomon and the eminent geologist P.G.H. Boswell, both at Imperial College in London, who identified the characteristic geological composition of each of the layers. The material taken from bed II differed significantly from the mineralized rock samples found in the matrix of the Oldoway skeleton (supplied for the occasion from Munich by Theodor Mollison), and Solomon and Boswell—together with Leakey, Hopwood, and Reck—concluded that Oldoway Man was probably contemporaneous with the age of bed IV or bed V, and had been buried in bed II strata that had been exposed by erosion before being covered again by bed V. Oldoway Man was old, but not early Pleistocene-period old, and neither were Leakey's Elmenteita and Nakuru skulls, unless some other regional stratigraphic correlations could be found that would place the Olduvai strata in a different temporal context.

Leakey's scientific reputation took something of a hit from the Oldoway Man affair, although he conceded the point reasonably quickly after Boswell and Solomon completed their geological sample studies.[437] However, Leakey's own dating of some fossil remains from Kanam and Kanjera, two sites near the southern shore of the Kavirondo Gulf on the Kenyan side of Lake Victoria, presented a larger problem.[438] In 1932, five days into his excavations at Kanjera, Leakey wrote to Miles Burkitt in Cambridge, describing his preliminary findings, and estimated

[436] L.S.B. Leakey, P.G.H. Boswell, J.D. Solomon, H. Reck, and A.T. Hopwood, "The Oldoway Human Skeleton," *Nature* 131, no. 3307 (March 18, 1933), 397-398.
[437] Morell, 68-69. Leakey had previously expressed doubts about Reck's age claim for Oldoway Man in 1929, and simply reverted to his earlier position.
[438] Morell, 65-67. The original Kanam find was made by Juma Gitau, one of the Kikuyu workers on the dig.

that the beds he was examining dated to the early Pleistocene, or the middle Pleistocene at the very latest:

> Geologically – older than the formation of the source of the Nile…i.e. poss. Rift faulting and of Kamasian or first pluvial date; paleontologically – typical Oldoway fauna – *Elephas antiqua*, etc.; archaeologically – equal to Oldoway beds II, III, and lower IV, i.e. containing Chellean and transitional Acheulean tools.[439]

When he found the mineralized skull cap of a *Homo sapiens* and small fragments of a second skull, Leakey was thoroughly convinced that they belonged in the strata in which they had been discovered. "Of course the critics will say that these new finds are later burials into the deposit," he wrote to Burkitt, "simply because they happen to be Homo sapiens & not Pithecanthropus or Eoanthropus or Sinanthropus!!" He continued:

> Everyone admits that *Homo sapiens* must go back to the beginning of the Pleistocene at least – somewhere. The question has always been Where? And the evidence today seems to suggest that the answer is "The region of the great central African lakes."[440]

Leakey assigned the skulls and mandible fragments to the genus *Homo*, although he gave them their own species designations. Based on the associated fossil fauna, he argued for placing the Kanam fragments in the early Pleistocene, and the Kanjera ones in the mid-Pleistocene. Additionally, the fossils had been found in association with stone tools, *in situ*, and without any obvious signs of earth shifting or intrusive burial. Here, Leakey felt, it could be fairly assumed that the hominin bones were as old as the strata they were discovered in. However, to establish his claims for the antiquity of *Homo* in East Africa, Leakey knew he needed someone with better geological training—and geological credibility—to verify his claims.

[439] Leakey to Burkitt, March 9, 1932. AR 4/2/1, box 116. MAA Archives, Cambridge.
[440] Leakey to Burkitt, March 9, 1932. AR 4/2/1, box 116. MAA Archives, Cambridge.

Before returning to Kenya for the 1934-1935 excavation season, his fourth in the field, Leakey hired a team of three recent Cambridge graduates: surveyor Sam White, bird-collector Peter Bell, and geologist Peter Kent.[441] He also invited the eminent British geologist P.G.H. Boswell, at the time the chair of Geology at Imperial College in London, to come down to Kenya for a few months in the fall to view the Kanam and Kanjera sites, with Kent to serve as his assistant.[442] The main party sailed for Mombasa from London at the end of October 1934, and Boswell followed by air a few weeks later.

Boswell was one of (if not the) pre-eminent British geologist of the era, whose career had gone from strength to strength. He was an excellent choice as an expert witness, and he and Leakey had already crossed paths while attempting to ascertain the age of Oldoway Man, an interlude that probably did not endear Leakey much to the senior geologist; Gowland Hopkins, then serving as the President of the Royal Society (to which Boswell was elected in 1931) made the introductions and requested Boswell's attention on the Kanam and Kanjera problem.[443]

Before Boswell's arrival in November 1934, Leakey visited both excavation sites—only to discover that the iron pegs he had placed in the ground to mark the sites had vanished, and he had no other evidence or maps or notes to show where they had originally been. He had relied

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[441] P.G. Kent to Virginia Morrell, October 19, 1985. NCUACS 43.5.93/A87, East African Archaeological Expedition papers, Nottingham University Library, Department of Manuscripts and Special Collections. Kent, who was 21 when he sailed out to Kenya with Leakey and the others, sent lush, descriptive letters back to his family at regular intervals, which dealt with both the scientific and the interpersonal conundrums that cropped up during the excavation season. (Leakey was in the process of separating from his first wife, Frida Avern, and pursuing an affair with Mary Nicol, later Mary Leakey, who he had invited to join him on the expedition, although only after P.G.H. Boswell had been safely dispatched back to Britain. The atmosphere was deeply uncomfortable for the third-party observers; see Sam White to Peter Kent, September 13, 1935, NCUACS 43.5.93/A58 and Peter Kent to his mother, March 14, 1935, NCUACS 43.5.93/A70.) For broader context, and the implications the affair had on Louis' professional prospects and credibility, see Morell, 68-79.

[442] Morell, 80-93. On Kent working with Boswell, see Leakey to Kent, August 24, 1934, NCUACS 43.5.93/A53.

[443] On this point, and Boswell's career more broadly, see G.H. Mitchell, "Percy George Hamnall Boswell, 1886-1960," *Biographical Memoirs of the Fellows of the Royal Society* 7 (November 1, 1961), 17-30.

heavily on photography to make a record of the diggings, planning to complete a more thorough mapping at a later point, but most of the photographic plates had been ruined. Of the two photographs that had survived of the sites, Leakey found himself unable to match his memory of the Kanam excavation to the landmarks preserved in the photo. Boswell, who had trekked all the way to East Africa to assess the geological age of two sites that could no longer be found, was understandably outraged.[444] In January 1935, Leakey and Boswell visited the excavation site at Kanjera, again with a single, surviving photograph in hand, and discovered that it did not even remotely match the location where Leakey remembered placing the iron pegs; it had apparently been mislabeled.[445]

Far from being an opportunity for Boswell to validate either Leakey's geological context or his scientific acumen, the Kanam and Kanjera expeditions threatened to scupper Leakey's career and credibility for good. Boswell returned to London at the end of January, with his report on the matter appearing in *Nature* at the beginning of March. The opening paragraph was a litany of poor research practice: Leakey's earlier expedition had "neither marked the localities on the ground nor recorded the sites on a map," and the photographs were first mislabeled and then misinterpreted by Leakey, who had mistaken the vistas for other sites.[446]

Boswell also observed that there was evidence of significant stratigraphic slippage and geological upheaval, meaning that beds of different geological ages could have easily become mixed up, or that fossils of one age could have ended up in beds of another. "I hold the opinion," he wrote, "that the geological age of the mandible and skull fragments is uncertain." Boswell concluded by praising the "wide experience and sound judgment" of E.J. Wayland, of the

[444] Morell, 85-89.
[445] Morell, 87.
[446] P.G.H. Boswell, "Human Remains from Kanam and Kanjera, Kenya Colony," *Nature* 135, no. 3410 (March 9, 1935), 371.

Geological Survey of Uganda, whose company he had greatly enjoyed during his stay in East Africa, and whose scientific sense Boswell trusted a great deal more than Leakey's enthusiasms.[447] Worse yet, Leakey hadn't even reported Boswell's doubts in the expedition's regular reports that were posted back to colleagues in Britain—a decision Leakey defended by claiming that he hadn't known what Boswell was going to write until he read the damning article for himself in *Nature*.[448]

In a letter to his family written after the Kanam and Kanjera scandal broke, geologist Peter Kent remarked:

> About Leakey: I agree with all Boswell's findings (I helped him, of course, while he was doing it). People will be apt to say that in the one case in which L's methods have been thoroughly inquired into, they are seriously wanting, and therefore distrust his other work. He tries to do so much that he is liable to [scramble?] things.[449]

Given this state of affairs, Leakey struggled with mainstream scientific approval for his other publications, even before the Kanam and Kanjera discoveries were debunked. He had asked French prehistorian Henri Breuil to write a preface to his 1934 *Adam's Ancestors: An Up-to-Date Outline of What Is Known About the Origin of Man*. Breuil refused:

> You are a great worker, and you have produced superb results…If your book were good *enough* I would whole-heartedly write you a preface. But it is, at least in great part, *very*

[447] For the record, Wayland also agreed with Boswell on the main conclusions stated in his report.
[448] Leakey to Burkitt, April 6, 1935. AR 4/2/1, box 116. MAA Archives, Cambridge. Leakey wrote: "Boswell has behaved in a most astonishing & ungentlemanly manner & has put me in a very stupid position." Leakey did in fact acknowledge that there were questions about the accuracy of his memories and photographs of the site where the Kanam fossil mandible was found, and that the wrong photograph was slated to be printed in his forthcoming book, but the mention reads like an airy reference to a simple clerical error, rather than a fundamental mistake that invalidated his results. See L.S.B. Leakey, "East African Archaeological Expedition, Fourth Season, Third monthly field report (Dec. 24th-Jan.24th), NCUACS 43.5.93/A54, East African Archaeological Expedition papers, Nottingham University Library, Department of Manuscripts and Special Collections.
[449] Peter Kent to his mother, May 6, 1935. NCUACS 43.5.93/A71, East African Archaeological Expedition papers, Nottingham University Library.

> *bad* (not because of the serious differences in ideas between you and me), frightfully weak.[450]

Leakey knew his East Africa, but in Breuil's assessment, he had only a superficial knowledge of the European cultural periods and stratigraphy, which failed him when he tried to correlate his own East African finds with them. Leakey also lacked the scientific standing in his field to write "*the* book of generalities," as Breuil described it, continuing: "Work, publish, but don't publish that. Even the good ideas, here and there in your book, would suffer from being launched in such mediocre and bad company."[451]

After *Adam's Ancestors* was released, Earnest Hooton found himself similarly impressed by Leakey's intimate familiarity with the rocks, stones, and bones of his East African sites, but not at all prepared to accept his far-ranging conclusions. In a review for *American Anthropologist*, Hooton professed himself "frankly…appalled at Dr. Leakey's temerity" in attempting to redefine the boundary between the Pliocene and Pleistocene periods according to index fossils, and by the way that Leakey argued for entirely new demarcations of the lower, middle, and upper Pleistocene periods, by using East African stone tool cultures as the global benchmark.[452] Leakey's narrative style was casual, even when reporting on the discovery of

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[450] Henri Breuil to Louis Leakey, undated early 1934. Fonds Breuil Br. 36, Archives scientifiques du Muséum nationale d'histoire naturelle (MNHN) Paris. Breuil wrote his draft of the letter by hand in French, and then it was typed up in English, probably by his secretary Mary Boyle.

[451] Leakey's response: "Unfortunately it is *not possible* to stop publication since the book was written for a *contract*. Since this is the case and I must publish anyhow, I should naturally be *most grateful* if you would let me know the things which you consider *most bad* so that if possible I can alter them." He pointed out that chapters 5 and 6, which dealt with Europe and had been particularly objectionable to Breuil, were based "*in the main*" on Breuil's own work. (All italics in the original.) See Leakey to Breuil, February 27, 1934. Fonds Breuil Br. 36, MNHN. He also proceeded to send Breuil a copy of the second printing of *Adam's Ancestors*. See Leakey to Breuil, August 24, 1934. Fonds Breuil Br. 36, MNHN.

[452] Earnest Hooton, draft review for "The Stone Age Races of Kenya, by Louis Leakey," (1935), 3. E.A. Hooton papers, series II, 1.65, Peabody Museum Archives, Cambridge MA. For the truncated published version, see Earnest Hooton, review of *The Stone Age Races of Kenya*, by L.S.B. Leakey, *American Anthropologist* 37, new series, no. 4 (October-December 1935), 681-685.

Homo kanamensis, a discovery whose ostensive importance Hooton felt should have merited "a bomb-proof, impregnable, archaeological position," while the description of the Kanjera site had neither exact measurements nor close-up photographs. Leakey was, in Hooton's estimate, "a brilliant young scientist," and his indefatigable appetite for work in East Africa was entirely to international anthropology's benefit. But it seemed to Hooton that Leakey was more than a bit out of his depth. "The work should have been parceled out among a group of experts, and executed less hastily and more thoroughly," wrote Hooton in his conclusion:

> An excellent model for scientists who are confronted with a gargantuan task involving extensive research in geology, paleontology, archaeology, and physical anthropology, is offered by the succession of admirable monographs issued from the Cenozoic Laboratory of China by the late Professor Davidson Black and his colleagues.[453]

The Cenozoic Laboratory had Rockefeller Foundation funding, a large and highly credentialed research staff, plus affiliations with the Chinese Geological Survey and the Peking Union Medical College that brought in even more personnel, expertise, connections, and money. In a side-by-side comparison, Leakey's search for Early Man in Kenya looked like a very amateur undertaking.

This was the conclusion that Arthur Smith Woodward reached when gave his presidential address to the British Association meeting of 1935 on "recent progress in the study of Early Man." Stone tools, "so well-known in Europe," had recently been discovered in association with Pleistocene fauna in Africa, which Smith Woodward took to mean that there might have been parallel migrations out of Asia and into both Africa and Europe roughly contemporaneously:

> Implements, like languages, however, afford no certain clue to the races which made and used them, and the same tools must have been invented independently more than once. It

[453] Earnest Hooton, draft review "The Stone Age Races of Kenya, by Louis Leakey," (1935), 9. E.A. Hooton papers, series II, 1.65, Peabody Museum Archives.

> is therefore unfortunate that hitherto no human remains have been found in undoubted association with any of the earliest implements and Pleistocene mammals in Africa.[454]

Smith Woodward continued by mentioning Leakey by name, noting his Kanam and Kanjera fumble and P.G.H. Boswell's geological analysis, which stated that there was no proof of temporal association between the fossil hominin fragments, the stone tools, and early Pleistocene mammals that Leakey had claimed. In fact, Smith Woodward continued:

> The only fossil hitherto discovered in Africa, which suggests that that continent may have produced man, is the immature skull from a deposit of uncertain age (probably Pleistocene) at Taungs in Bechuanaland, which was named *Australopithecus* by Prof. Raymond Dart in 1925.[455]

"It belongs to an ape," although an ape with perhaps more human-like features than average; either way, Smith Woodward dismissed it, since Dart had so far failed to publish a monographic study.[456] The growing depth of archaeological and geological knowledge about Africa provided critical supporting evidence, but there was no straightforward and uncontested hominin material to hold everything together. Smith Woodward pointed out that the array of fossil hominins that had been discovered in East and southeast Asia, and the Siwalik fossil apes India made a neat arc around an evolutionary nexus in Central Asia. Linking together the geological, archaeological, and paleontological evidence, though, was still impossible, at least as far as Smith Woodward—and the British scientific establishment—were concerned.

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[454] Arthur Smith Woodward, presidential address to Section H (Anthropology) of the British Association, delivered at Norwich, September 9, 1935. Reprinted as "Recent Progress in the Study of Early Man," *Nature* 136, no. 3437 (September 14, 1935), 421.
[455] Smith Woodward, "Recent Progress," 421.
[456] Dart will be discussed in detail in the next section, but the reason there was no monograph was because his manuscript had been rejected for publication by the Royal Society in 1929, a fact of which Smith Woodward, as a Fellow and a relevant expert who probably reviewed the manuscript, was almost certainly aware.

When Leakey had hired Peter Kent as a geologist for the 1934-1935 expedition season, he also mentioned that he hoped Kent would be able to carry out a detailed survey, including a complete stratigraphic map, of Rusinga Island, a relatively large landmass in the eastern part of Lake Victoria. Leakey had previously identified "some ten localities yielding an important Miocene vertebrate fauna which includes anthropoid apes."[457] In the spring of 1935, Kent completed a detailed survey of the geology of the island—which he thoroughly enjoyed—before returning to Britain at the end of his research year.[458] Leakey continued to sporadically visit the island as he was able throughout the 1930s, and then again for short visits in 1940 and 1942.[459]

During this last visit, in September 1942, he discovered an excellent specimen of *Proconsul*, a type of fossilized ape from Miocene-era deposits.[460] The first *Proconsul* had been excavated and named by Arthur Hopwood, when he had joined Leakey for the third season of his East African Archaeological expeditions in 1930-31; the name was a reference to Consul, a chimpanzee at the London Zoo. Leakey's 1942 find, though, was significantly more complete. It also could be placed in a well-documented geological stratum, full of well-known index fossils. In this case, wrote Leakey in 1946, Kenya might indeed be one of the most important sites in human evolution studies:

> Taken in conjunction with the fact that Africa is the home of the two most man-like great apes, the gorilla and the chimpanzee, the presence in the Lower Miocene beds of Kenya of members of the orang-utan and gibbon stock, as well as of the most interesting creature *Proconsul* does most strongly suggest that we may have in Kenya the Lower

[457] L.S.B. Leakey to Peter Kent, August 14, 1934. NCUACS 43.5.93/A53, East African Archaeological Expedition papers, Nottingham University Library, Department of Manuscripts and Special Collections.
[458] Kent to his mother, February 5, 1935. NCUACS 43.5.93/A70, East African Archaeological Expedition papers, Nottingham University Library, Department of Manuscripts and Special Collections.
[459] Morell, 132.
[460] L.S.B. Leakey, "A Miocene Anthropoid Mandible from Rusinga, Kenya," *Nature* 152, no. 3855 (September 18, 1943), 319-320.

> Miocene center of primate evolution, the center, perhaps, where man and the great apes evolved before spreading over the world.[461]

The morphological characteristics of the jaw were ape-like, but the fossil showed dentition patterns that bore a resemblance to human ones. It was far too old to be an early human relic—the Miocene period predated the Pliocene, which predated the Pleistocene, when early humans were believed to have emerged—but was of a reasonable age to be considered as a common ancestor before the hominin and great ape lines diverged.

Proconsul might be important in hominin evolution, but it was just one data point. Leakey could spin narratives of evolutionary radiation and out-migration from eastern Africa, but it was uncertain if anyone else would believe him. With his go-it-alone attitude, messy excavation record, and weak documentation practices, Leakey was in a poor position to shift scientific opinion towards an African center of human evolution. There needed to be many more pieces of evidence, and they needed to be placed in a coherent framework by someone of unimpeachable scientific reputation. That person was definitely not Leakey—just as, twenty years earlier in South Africa, it had also not been Dart.

Consider the Australopithecus

On February 14, 1925, a series of articles by Britain's most notable anatomists appeared in *Nature*. Their collective title was "The Fossil Anthropoid Ape from Taungs."[462] Arthur Keith, Grafton Eliot Smith, Arthur Smith Woodward, and W.L.H. Duckworth wrote in response to controversial piece published the previous week by the South African anatomist Raymond Dart,

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[461] L.S.B. Leakey, "Was Kenya the Centre of Human Evolution?" *Illustrated London News*, August 24, 1946.
[462] Arthur Keith, G. Elliot Smith, W.L.H. Duckworth, and Arthur Smith Woodward, "The Fossil Anthropoid Ape from Taungs," *Nature* 115, no. 2885 (February 14, 1925), 234-236.

describing a fossilized skull of an anthropoid (man-like) ape that had been discovered the previous December at a limestone mine in Taungs, South Africa.[463] To Dart, the structure of the forehead, eye sockets, nasal passages, and what remained of the mandible all seemed nearer in shape to human norms, although the skull was approximately the size of that of a young gorilla or chimpanzee. The teeth also suggested the fossilized "man-ape" was morphologically more like modern humans than modern apes. Patterns of molar eruption, however, suggested that the specimen was only a juvenile at its death, which made the comparison more challenging; the difference between species was much more visible in a head-to-head comparison between adult humans and adult apes who had lost their milk-teeth. The fossil was tiny – photographs taken later showed it fitting comfortably in Dart's cupped hands – and, of course, one of a kind. Dart had no other specimens available to which to compare his "Taungs Baby," as the fossil was nicknamed.

From this provocative but spare body of evidence, Dart had made an enormous interpretive leap. It was "obvious," wrote Dart, that *Australopithecus* had to represent a fossil group that was more human-like in dentition and brain size compared to the living apes – and in exactly the ways "which are to be anticipated in an extinct link between man and his simian ancestor."[464] Eugène Dubois' Javanese *Pithecanthropus* was no missing link, but instead "an ape-like man, a caricature of precocious hominid failure."[465] In order to place his specimen on the taxonomic tree, Dart called for the creation of a new family, the *Homo-simidae*. He named his new specimen *Australopithecus africanus*, to honor both "the extreme southern and unexpected horizon" of the man-like ape's discovery and the African continent itself. This, Dart

[463] Raymond A. Dart, "*Australopithecus africanus*: The Man-Ape of South Africa," *Nature* 115, no. 2884 (February 7, 1925), 195-199.
[464] Dart, *"Australopithecus africanus*," 198.
[465] Dart, *"Australopithecus africanus*," 198.

said, was in vindication of the "Darwinian claim that Africa would prove to be the cradle of mankind."[466]

The delegation of eminences tasked with replying to this extraordinary proposal took positions in reply ranging from the mildly encouraging to the brutally dismissive. Grafton Elliot Smith, Dart's former professor at University College London, commented that Dart's conclusion was surprising, and noted that the "human features" Dart had identified in the structure of the cranium could easily be seen in the skulls of juvenile great apes, and even in adult giant gibbons.[467] Elliot Smith waited on more evidence of the nature of the Taungs creature's brain and the fossil's geological context before he could support Dart's claims. Given that the specimen had been blasted out of the side of a limestone mine long before Dart could get his hands on it, this further evidence of brain size and geological context would be nearly impossible to produce, short of finding additional examples of *Australopithecus* in a less precarious situation.

Arthur Keith wrote that he looked forward to reading Dart's complete evidence when it was presented fully in a future monograph.[468] In the meantime, he placed *Australopithecus* in the same family or sub-class as chimpanzees and gorillas. W.H.L. Duckworth followed Keith in declaring *Australopithecus* to be an extinct relative of the gorilla, although valuable in that it might provide insight into the relationship between the anthropoid apes of Asia and Africa, especially if the fossil could be compared against anthropoid fossil fragments taken from the Siwalik hills in India.[469] Lastly, Arthur Smith Woodward wrote that while he was not yet convinced by the cases for either the Asian or African origins of humanity, "The new fossil from

[466] Dart, *"Australopithecus africanus*," 198.
[467] Keith et al., "Fossil Anthropoid," 235.
[468] Keith et al., "Fossil Anthropoid," 234.
[469] Keith et al., "Fossil Anthropoid," 236.

South Africa certainly has little bearing on the question." He additionally judged Dart's species name, a Greek-Latin portmanteau, to be "barbarous."[470]

The reasons why Dart was not immediately taken seriously were compelling. His *Australopithecus* announcement coincided with the mid-point of a high-profile American expedition to find the ancestors of humankind in Central Asia, and was overshadowed by the announcement of prehistoric hominin fossils from Zhoukoutien a few years later. The theory of Holoarctic dispersal, developed by W.D. Matthews and Davidson Black and used to justify the enormous expeditionary work in Central Asia, was focused on the evolution and dispersal of animal species in the northern hemisphere, and assumed that the continents in the southern hemisphere were evolutionary cul-de-sacs, populated via migration from the north if they contained the same or closely-related species found on other continents. [471] Matthew's and Black's papers even used special map projections that centered the north pole so that the actual size and distribution of the landmasses in the northern hemisphere could be better appreciated, making the continents of the southern hemisphere the literal ends of the earth. In this theoretical framework, an African center of evolutionary dispersion or mammalian origins was not even remotely plausible, and did not need to be addressed. Indeed, even if the anatomists had found Dart's interpretative gloss on the ill-named *Australopithecus* compelling, one data point was not enough to build a vector describing human evolution and migration over thousands or millions of years. Evidence adduced, case dismissed.

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[470] Keith et al., "Fossil Anthropoid," 236. A follow-up note published in *Nature* in March continued to bash Dart's designation, calling "Australopithecus" an "unpleasant hybrid, as well as being etymologically incorrect."

[471] See W.D. Matthew, "Climate and Evolution," *Annals of the New York Academy of Sciences* 24 (February 18, 1915), 171-318; and Davidson Black, "Asia and the Dispersal of Primates," *Bulletin of the Chinese Geological Society* 4, no. 2 (March 1925), 133-183. In every diagram, Africa is only visible at the edge of the globe, and the entire continent is never fully drawn, even in the maps that don't use the North Pole as the center point for the projection.

Nevertheless, by the 1950s the Australopithecines had been rehabilitated, and held a place on the hominin family tree. Dart's chief problems in 1925 came down to the oddness of his fossil, and the flimsiness of the material evidence to support his claims. With only a single juvenile specimen, with no geological context, even a highly credible elite scientist at the heart of the imperial metropole might have struggled to gain acceptance for the kinds of claims Dart wanted to make—and he was a young, relatively undistinguished Australia-born and anatomist at a small South African medical school, which was actually located at the end of the earth. The repeated petty complaints in *Nature* about how Dart had inappropriately combined roots from Greek (*Australis*, south) and Latin (*pithecus*, ape) to name his find seem to indicate how low Dart ranked in the eyes of the British scientific establishment.[472]

Instead, the process of reconsidering the Australopithecines depended on the gradual accretion of data, especially the discovery of similar fossils from similar geological deposits around the Transvaal region. This was not the work of Dart, but rather of Robert Broom – a peripatetic Scottish-born medical doctor with a side interest in paleontology, who had lived and worked in South Africa since 1897.[473] Broom had studied medicine in Glasgow, although by the 1910s he was better described as a paleontologist with a medical hobby, rather than vice-versa. He undertook extensive fossil-hunting expeditions in South Africa, in addition to briefly holding the chair of geology and zoology at Victoria College in Stellenbosch. In 1913, he gave the prestigious Croonian Lecture at the Royal Society in London, speaking on the topic "The Origin of Mammals," and was elected as a Fellow in 1920. Later, in 1932, he published the results of

[472] Plenty of other English words, like television (Greek-Latin), automobile (Greek-Latin), or claustrophobia (Latin-Greek) combine Greek and Latin roots exactly the same way as *Australopithecus*. (Thank you to Michael Gordin for this point.)
[473] W.E. Le Gros Clark, "Obituary—Dr. Robert Broom, FRS," *Nature* 167, no. 4254 (May 12, 1951), 752.

more than twenty years of paleontological study in South Africa in a monograph titled "The Mammal-like Reptiles of South Africa."[474]

When he became involved with the investigations of the Australopithecines in the 1930s, Broom did so from a position of significantly greater professional and personal stability, although his marginal geographic position (and tenuous economic standing, since part-time medicine wasn't especially remunerative) constrained his credibility to a certain degree. Broom again fits into the larger pattern of colonial prehistory and paleontology hobbyists, who balanced everyday life at the margins of the British empire with their personal passions for excavation. Over the course of the 1930s and 1940s, and as his fossil base of evidence continued to expand, Broom became increasingly convinced by the Australopithecines, and of the rectitude, at least in general terms, of Dart's original 1925 claims.

Many aspects of the *Australopithecus* controversy were specifically British, or at least confined to the intellectual byways of the British empire. This is not to say that observers from other national traditions were not interested in the *Australopithecus* problem, but that the channels of credentialing and authority that Dart, Broom, and their fellows operated within ran along the major arteries of British imperial power.[475] Ideas and theories were validated on the ground, in the laboratories and institutions where the evidence had been gathered, by experts who had traveled down for scientific interactions with their peers in another part of the British global network, and who moved together through a series of professional and imperial spaces.

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[474] Robert Broom, *The Mammal-like Reptiles of South Africa and the Origin of Mammals* (London: HF & G Witherby, 1932).

[475] Here my thinking has been shaped by Ross Jones and Warwick Anderson, "Wandering anatomists and itinerant anthropologists: the antipodean sciences of race in Britain between the wars," *British Journal for the History of Science* 41, no. 1 (March 2015), 1-16.

Broom's engagement with the Australopithecines dates to the early 1930s, when Jan Smuts, then serving as South Africa's Deputy Prime Minister and for Broom an acquaintance of long standing, helped arrange for Broom to be appointed as curator at the Transvaal Museum in Pretoria in 1934.[476] After two years of productive paleontological work on fossil mammals and reptiles, in 1936 Broom went out with two of Dart's students from the University of the Witwatersrand to explore a set of caves near Sterkfontein. Sterkfontein was a valley primarily known for its limestone mining industry, much like Taungs, and where miners often encountered fossilized skeletons in the rocks. As Broom described the work to a scientific audience in Philadelphia in 1937:

> …about the middle of 1936 I thought it would be well to start on the study of the limestone caves of the Transvaal to see if I might find either traces of primitive man or a new specimen of *Australopithecus*.[477]

Regardless of whether any man-apes showed up, Broom was certain that he would at least find some interesting new fossil mammals. During the preceding years, he had become friends with the Sterkfontein quarry supervisor, George Barlow, who had a standing agreement with Broom to alert him to any fossils resembling Dart's Taungs find. In 1936, Barlow came through spectacularly on his promise when he presented Broom first with the fossilized braincase of what seemed to be an adult *Australopithecus*.

Broom named the fossil *Australopithecus transvaalensis*, and argued that it was closely related although not quite identical to *Australopithecus africanus.* In 1938, Barlow introduced Broom to a schoolboy who had discovered fossilized hominin teeth a few miles away at

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[476] Kuljian, 83-91.
[477] Robert Broom, "On Australopithecus and Its Affinities," in George Grant MacCurdy, ed. *Early Man as Depicted by Leading Authorities at the International Symposium*, the Academy of Natural Sciences, Philadelphia, March 1937 (Philadelphia: J.B. Lippincott Company, 1937), 287.

Kromdraai.[478] After meticulously combing over the site with assistants, Broom was able to piece together a nearly complete hominin skull. It appeared again to be closely related to the Taungs skull, although this example was much sturdier, with a bigger jaw and flatter face; Broom named it *Paranthropus robustus*.[479] Broom's *Australopithecus* seemed to be a mature specimen, although it was still difficult to prove that Dart's "baby" could matured to become Broom's *A. transvaalensis*. There was also very little contextual evidence that would allow Broom to assign his finds to a clearly-defined geological period, which was crucial to understanding *Australopithecus*' chronological position on the primate family tree.

It was also not clear what relationship *Australopithecus* bore to *Sinanthropus* and *Pithecanthropus*, both of which were increasingly available for international study as the digs in Zhoukoudian and Java progressed. At an international symposium on Early Man held in Philadelphia in 1937, Broom suggested that perhaps there had been multiple contemporaneously co-existing ape-like species, with only one line leading to modern humans. Both Peking Man and Java Man were very much on the minds of the attendees, since W.C. Pei, Eugène Dubois, and G.H.R. von Koenigswald were also all presenting papers on their work in Asia. In a roundtable session on Asian chronology, it was determined by the participants that the Peking Man and Java Man groups could both be assigned to the Middle Pleistocene period.[480] If Broom, Dart, or anyone else working on African fossils could establish that their man-apes were from the lower Pleistocene or earlier, they would radically strengthen their claim for the importance of the Australopithecines in human evolution.

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[478] Kuljian, 85, 89.
[479] Kuljian, 89-90.
[480] Edgar B. Howard, "Minutes of the International Symposium on Early Man Held at the Academy of Natural Sciences of Philadelphia, March 17-20, 1937, In Celebration of Its One Hundred and Twenty-Fifth Anniversary," *Proceedings of the Academy of Natural Sciences of Philadelphia* 89 (1937), 447.

While Broom was collecting and studying fossils, Dart was still at Wits, teaching anatomy in the medical school and maintaining and expanding his extensive collection of human skeletons representing living human "types."[481] Much of Dart's research during the 1930s was focused instead on living populations, and he was heavily occupied with conducting racial studies on African hunter-gatherer groups living in the Kalahari Desert.[482] He was still concerned with validating the Taungs fossil, but the monograph he had planned to write was rejected for publication by the Royal Society in 1929.[483] He even received a brush-off from the ever-diplomatic Davidson Black, whom he wrote to in October 1929 with what Black politely described as "your analysis of the South African situation." "Of course, I do not agree with you," replied Black, "but such differences of opinion as we have make for progress."[484]

Instead, Dart joined an Italian expedition to Central Africa led by Italian explorer and film-maker Attilio Gatti. For eight months in 1930, Dart hunted big apes in Central Africa and learned to make face masks for racial typographical analysis. He brought this skillset into the field with him six years later, during the 1936 Witwatersrand-Kalahari Bushman Expedition, where he prepared more than 70 facial masks and conducted extensive physical measurements, including measuring individual's heads, buttocks, and genitals.[485] His Italian collaboration also continued throughout the 1930s. In 1934, Dart sent 40 "Basuto brains," carefully labeled and tabulated by sex and the weight on packing, to Lidio Cipriani at the Italian National Museum of

[481] Kuljian, 60-63.
[482] See Kuljian, 60-75; and Saul Dubow, "Human Origins, Race Typology and the Other Raymond Dart," *African Studies* 55, no. 1 (1996), 1-30.
[483] Dubow, "Human Origins," 12.
[484] Davidson Black to Raymond Dart, January 16, 1930. (Raymond Dart papers, University of Witswatersrand archives.) My profound thanks to Adrian Young for sharing this source. (All citations to Wits material on Raymond Dart comes from AY.)
[485] Kuljian, 64-65.

Anthropology and Ethnology in Florence.[486] Cipriani was a leading proponent of the so-called biological or "Nordic" racism in Fascist Italy, and a lead signatory to the "Manifesto of the racial scientists" of 1938, which claimed that Italians were part of the Aryan race, and that all other races were inferior.[487] In exchange for the brains, Cipriani offered Dart a collection of detailed facial masks of Tuareg and Tébu people, probably made in Italian Libya, and agreed to Dart's additional request for "a male and a female pygmy skeleton" from some European institution.[488]

Both Dart's and Broom's research work on the Australopithecines coincided with the period when Jan Smuts and J.B.M. Hertzog (prime minister from 1924 until 1939) formalized South Africa's racial segregation policies through the regulation of social life, property ownership, and freedom of movement throughout the country.[489] Smuts, for example, was a significant booster of paleontological and archaeological work in South Africa, as well as a patron of South African science in general, and had written several articles on prehistory, evolution, climate, and race during a period of political eclipse in the 1920s.[490] Dart also lectured extensively on race, culture, and the spread of civilization in the 1920s, to both academic and general audiences. His central point was that even if the human species had begun in southern Africa, culture and "civilization" had spread to the region from somewhere else. Rock art, iron smelting, and even the enormous ruins of the Great Zimbabwe civilization were connected to

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[486] See "Report on Condition of Basuto Brains Packed for Transport to Italy," undated; Raymond Dart to Lidio Cipriani, Museo Nazionale di Antropologia e Etnologia, Firenze, August 4, 1934; Lidio Cipriani to Raymond Dart, July 4, 1934. (Raymond Dart papers, University of Witswatersrand archives.)
[487] Cipriani flourished under Fascism, but he also remained active in European anatomy and anthropology after the war, enjoying a productive career until his death in 1962. See Francesco Cassata, *Building the Common Man: Eugenics, Racial Sciences, and Genetics in Twentieth Century Italy*, trans. Erin O'Loughlin (Budapest: Central European University Press, 2001), 223.
[488] Dart to Cipriani, April 26, 1934. (Raymond Dart papers, University of Witswatersrand archives.)
[489] Dubow, "Human Origins," 5-6.
[490] See Nathan Schlanger, "Making the Past for South Africa's Future: The Prehistory of Field-Marshal Smuts (1920s-1940s)," *Antiquity* 76, no. 291 (March 2002), 200-209.

cultural influence that had spread across the Indian Ocean and down the eastern coast of Africa from the Middle East, possibly having originated in some cultural center in Egypt or Mesopotamia.[491] Increasingly, this position brought him into conflict with specialists in the prehistory of southern Africa.

Although popular opinion at the end of the nineteenth century had confidently declared the ruins to be the work of "an ancient people from the East," two in-depth investigations by David Randall-MacIver in 1905-1906 and Gertrude Caton Thompson in 1929 had suggested the complex was probably the work of the ancestors of the present-day African peoples living in the region.[492] Randall-MacIver concluded that the site dated back to the fourteenth or fifteenth century C.E., describing the "character of the dwellings contained within the stone ruins" and the tools, beads, and other items found at the site as unmistakably typically African.[493] "In the architecture," he wrote in his conclusion, "there is not a trace of Oriental or European style of any period whatever." Twenty years later, the British Association, the Rhodes Trust, and the Rhodesian government all concluded that the identity of the Zimbabwe builders merited further study, and Caton Thompson was granted funding and research permits in the spring of 1929. After sinking several deep excavation trenches, Caton Thompson and her team concurred with Randall-MacIver's conclusions, agreeing that the builders of the Zimbabwe ruins were probably the ancestors of modern African peoples living in the Transvaal region, although Caton Thompson moved the date of settlement back to approximately the seventh century C.E.[494]

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[491] Dubow, *Scientific Racism in South Africa*, 46-47.
[492] Quoted in David Randall-MacIver, *Mediaeval Rhodesia* (London: Macmillan & Co., Ltd. 1906), vii.
[493] Randall-MacIver, 83.
[494] See discussion in Gertrude Caton Thompson, *Mixed Memoirs* (Gateshead: The Paradigm Press, 1983), 118-136; G. Caton Thompson, "The Southern Rhodesian Ruins: Recent Archaeological Investigations," *Nature* 124, no. 3129 (October 19, 1929), 619-621; and Gertrude Caton Thompson, *The Zimbabwe Culture: Ruins and Reactions* (Oxford: The Clarendon Press, 1931).

Caton Thompson's work pushed for greater recognition of the depths of available time and the long sweep of African cultural development, which had been largely ignored or denied by European observers—a controversial claim, although one that was made more acceptable by Caton Thompson's status as a Cambridge-educated archaeologist with an excellent reputation.[495] Dart did not significantly help his own reputation when he got into a spectacular shouting match with a deeply unimpressed Caton Thompson over the origins of Great Zimbabwe at the British Association meeting held in Johannesburg in 1929.[496]

In 1938, American anatomists William K. Gregory and Milo Hellman visited Broom in South Africa to make a detailed study of the dentition of *Plesianthropus* and *Paranthropus*. Ultimately, the two Americans decided the dentition showed many characteristics that were deemed "transitional" between apes and humans, with an overall pattern that was closer to that of humans.[497] Gregory, a long-time member of the curatorial staff at the American Museum of Natural History and head of the museum's comparative anatomy department, had frequently clashed with his former chief Henry Fairfield Osborn over the latter's Dawn Man; at one bad moment in 1928, Gregory even wrote to his British colleague D.M.S. Watson to complain that

[495] Reviewing Caton Thompson's *The Zimbabwe Culture* for the *American Journal of Sociology* in 1932, American anthropologist Melville Herskovits described Caton Thompson's research and excavation methodology as "one of the most perfect in execution and…one of the most satisfactory of archaeological investigations that have been undertaken in recent years." See Melville J. Herskovits, review of *The Zimbabwe Culture*, by G. Caton Thompson, *American Journal of Sociology* 37, no. 6 (May 1932), 1012-1013.

[496] Gertrude Caton Thompson, *Mixed Memoirs*, 132. He was joined (in spirit if probably not in volume) by the German ethnologist Leo Frobenius, another proponent of the Middle East cultural diffusion theory. Caton Thompson noted that the responses of both the conference attendees and the South African and Rhodesian newspapers that reported on the story heavily depended on the attitudes they professed on "the ineptitude of the modern [Africans]" and the "unbelievable contrast with the Zimbabwe builders," as well as evidence on whether gold mining had historically taken place in the region.

[497] William K. Gregory and Milo Hellman, "Evidence of the Australopithceine Man-Apes on the Origin of Man," *Science* 88, no. 2296 (December 30, 1938), 615-616.

Osborn's fixation on the Dawn Man theory was giving fuel to anti-evolutionists in the United States because it was so profoundly ridiculous.[498]

Compared to Osborn's idealized proto-Aryan Dawn Men, the Australopithecines were transitional human ancestral types of a radically different kind, with their small stature, smaller brains, and plethora of transitional human-simian features. Osborn's death in 1935 finally freed Gregory from some of the pressure from above to conform to Osborn's theories on human evolution.[499] Increasingly, Gregory and Hellman became convinced that the Australopithecines were important for understanding the course of human evolutionary development, and over the next few years they published several articles on the dentition of the Australopithecines, while Broom continued his search for more complete (or simply more) of the man-ape fossils. In 1939, however, excavations at Sterkfontein were closed at the beginning of the war.

Broom turned to analyzing his finds and began work on a monograph describing the "ape-man" fossils. In New York, Gregory made a reconstruction of the skull of *Plesianthropus*, although Broom later deemed it "not very satisfactory and in rather large error in a number of points," and much less satisfactory than his own reconstruction.[500] In a letter to Franz Weidenreich in 1941 (by then ensconced at AMNH working on his study of the Peking Man skulls) Broom mentioned that he had discovered something that looked similar to a

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[498] William K. Gregory to D.M.S. Watson, January 3, 1928. NCUACS 42.4.93/B.6 USA, D.M.S. Watson papers, UCL Special Collections.

[499] On Osborn, Gregory, and disputes over the exact lineage of human evolution at the AMNH, see Constance Areson Clark, *God—or Gorilla: Images of Evolution in the Jazz Age* (Baltimore: The Johns Hopkins University Press, 2008). See also William K. Gregory, "A Critique of Professor Osborn's Theory of Human Origin," *American Journal of Physical Anthropology* 14, no. 2 (April-June 1930), 133-164. This disagreement between Osborn and Gregory was so long-running and well-known that it was reported by *Popular Science Monthly* in August 1927; see "Man Was Never an Ape – Henry Fairfield Osborn," *Popular Science Monthly* 111, no. 2 (August 1927), 35. Gregory subsequently wrote an extended series for *Popular Science Monthly* in 1931 about evolution, including the importance of studying dentition patterns to determine evolutionary relationships.

[500] Robert Broom to Franz Weidenreich, May 13, 1941. (W445, 11:F4, AMNH).

Gigantopithecus tooth, of the type that G.H.R. von Koenigswald had been studying in Java. Broom wasn't entirely convinced of the similarities, although he was open to indulging in speculation. To Weidenreich he wrote "One likes to make suppositions even if a little wild – it gives rise to new lines of thought and new possibilities."[501] (Weidenreich, who annotated his letters as he read them, left an emphatic "**!**" penciled in the margin next to this sentiment.)

By 1945, work was almost complete on "The South African Fossil Ape-Men." The monograph was published under the imprint of the Transvaal Museum, with a preface written by Jan Smuts.[502] It had been, as Broom wrote to an old acquaintance at the Natural History Museum in London, W.R. Dawson, an essentially nine year-long project to prepare, analyze, and describe the *Australopithecus*, *Plesianthropus*, and *Paranthropus* skulls.[503] In the monograph, Broom's co-author G.W.H. Schepers focused on the structure and capacity of the Australopithecine brains, even speculating based on the evidence that the "man-apes" might have possessed a form of speech. Broom handled all the other components – the geological siting, the associated fossil fauna, and the thorough description of the fossilized bones and teeth. "I have had to tread on a few toes," he wrote to Dawson. Broom was sure "the majority of English scientists see only Chimpanzees in our fossil ape-men." He continued:

> I see only higher apes which are nearly human which have no near affinity with the Chimp or Gorilla. The truth has to be told…I never was so certain I am right as I am today…It will be interesting to see what critics say. Alas it does not worry me in the least. The book is rather revolutionary and about ¾ of our old views will have to be scrapped.[504]

[501] Robert Broom to Franz Weidenreich, October 17, 1941. (W445, 11:F4, AMNH).
[502] J.C. Smuts, "Preface," in R. Broom and G.W.H. Schepers, *The South African Fossil Ape-Men, The Australopithecinae*, Transvaal Museum Memoir No. 2 (Pretoria: The Transvaal Museum, 1946), 3.
[503] Robert Broom to W.D. Dawson, September 2, 1945. L Mss DAWS A (NHM London)
[504] Robert Broom to W.D. Dawson, September 2, 1945. L Mss DAWS A (NHM London)

At three months shy of his seventy-ninth birthday, Broom was more than willing to embrace the fight. The two chief questions were: how old were the Australopithecines, and where did they belong on the primate family tree?

Initially, Broom took a more conservative perspective on chronology, and dated the new Australopithecines from Sterkfontein and Kromdraai to only the Mid-Pleistocene, or the early Pleistocene at a far reach. However, after a colleague unearthed the remains of a fossilized hyena (usually dated to the Pliocene period) alongside remains of fragmented baboon skull of a type that Broom believed to be contemporaneous with his ape-men, he revised his estimate. Now, he placed the Australopithecines in the late Pliocene—making them older than either *Pithecanthropus* or *Sinanthropus*.[505]

Broom's other intervention was to frame *Australopithecus* as a recent offshoot from the main human evolutionary line. In this, he differed from both Arthur Keith, who marked the Australopithecines as diverging from the gorilla and chimpanzee line (see figure 12, upper right diagram) and William Gregory, who accepted a marginally closer relationship, but only just—he placed the Australopithecines as a third line coming off the last common ancestor shared by both the human line (including *Pithecanthropus*, the Neanderthals, and Piltdown Man) and the modern great apes (see figure 12, lower left diagram). Broom's diagram had had a long gestation

[505] See note from R. Broom, appended to the Preface by J.C. Smuts, 6. Smuts had written the preface in 1944, and wrote authoritatively about the obvious mid-Pleistocene age of the fossils—not the conclusion Broom wanted his scientific readers to draw from his work.

period; he had been thinking along these lines since at least 1941, when he sketched a similar hominin family tree in a letter to Franz Weidenreich (figure 13).[506]

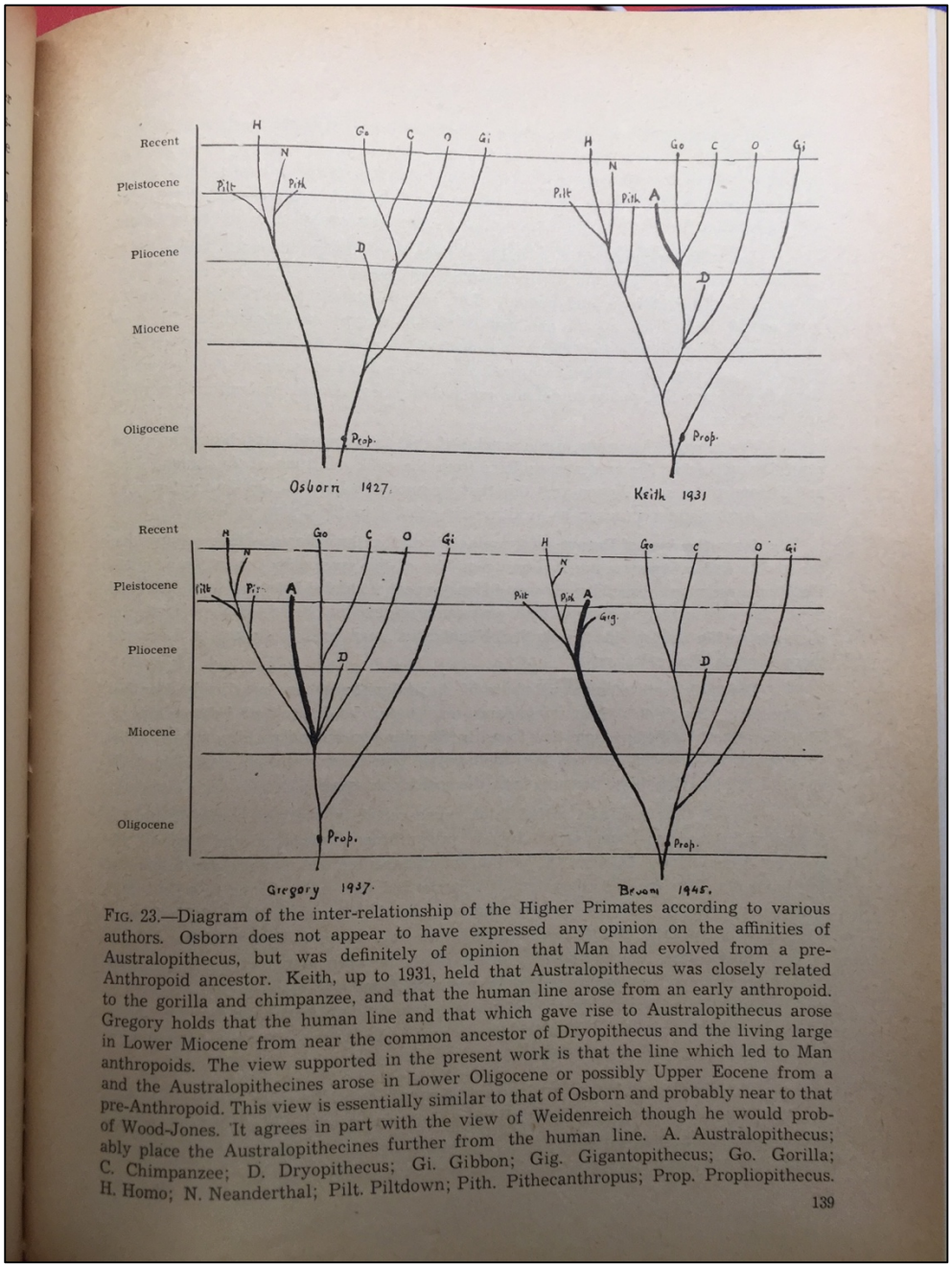


FIG. 23.—Diagram of the inter-relationship of the Higher Primates according to various authors. Osborn does not appear to have expressed any opinion on the affinities of Australopithecus, but was definitely of opinion that Man had evolved from a pre-Anthropoid ancestor. Keith, up to 1931, held that Australopithecus was closely related to the gorilla and chimpanzee, and that the human line arose from an early anthropoid. Gregory holds that the human line and that which gave rise to Australopithecus arose in Lower Miocene from near the common ancestor of Dryopithecus and the living large anthropoids. The view supported in the present work is that the line which led to Man and the Australopithecines arose in Lower Oligocene or possibly Upper Eocene from a pre-Anthropoid. This view is essentially similar to that of Osborn and probably near to that of Wood-Jones. It agrees in part with the view of Weidenreich though he would probably place the Australopithecines further from the human line. A. Australopithecus; C. Chimpanzee; D. Dryopithecus; Gi. Gibbon; Gig. Gigantopithecus; Go. Gorilla; H. Homo; N. Neanderthal; Pilt. Piltdown; Pith. Pithecanthropus; Prop. Propliopithecus.

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Figure 12 Comparison of proposed relationships between humans, apes, and known fossil hominins in Robert Broom, *The South African Fossil Ape-Men* (Pretoria, 1946), 139.

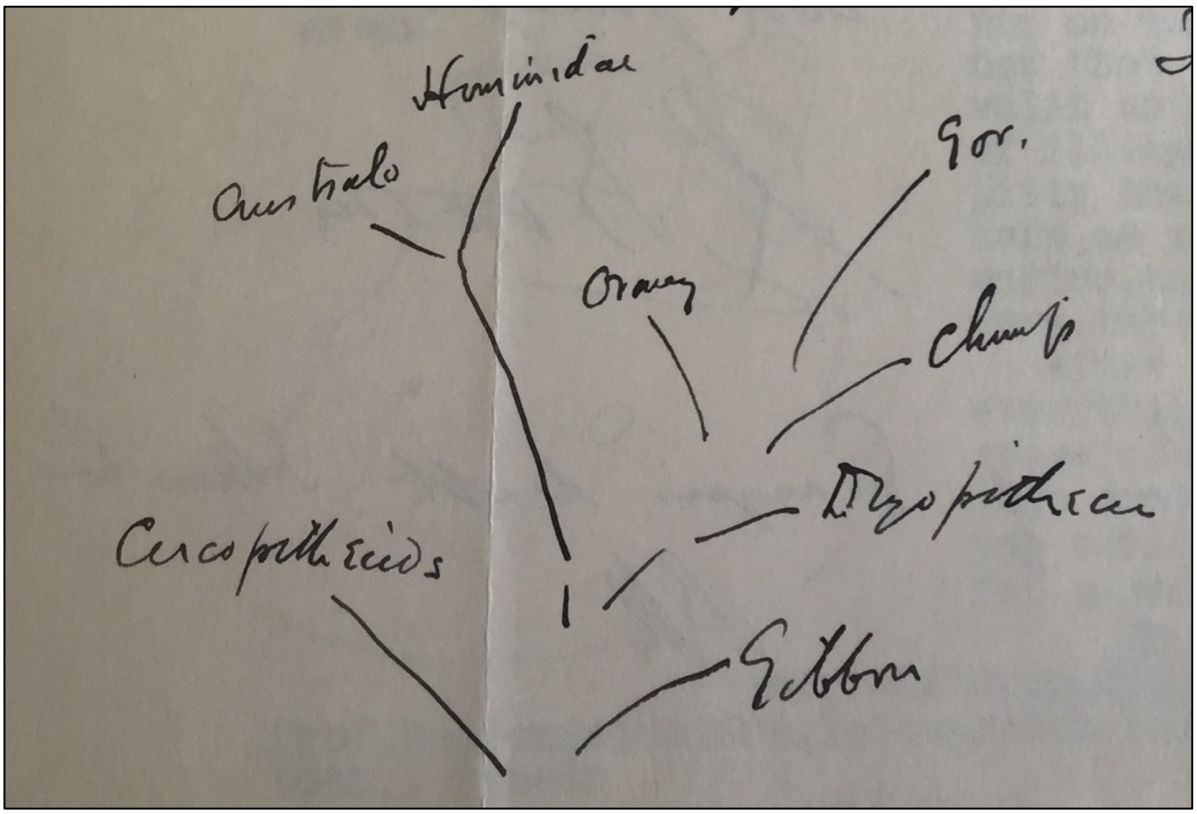


Figure 13 Species relationship sketch, Robert Broom to Franz Weidenreich, January 20, 1942. (W445, 11:F4, AMNH).

Broom had expanded the body of *Australopithecus* evidence three-fold through his solo investigations, but there were still many fossiliferous deposits scattered around the Transvaal region that begged for serious study. "When some wealthy man or corporation undertakes the systematic exploration of our deposits, as the Rockefeller Institute has done at Pekin and the Carnegie Institution in Java," Broom wrote:

> I think it likely that far more important results will be obtained than at either of these Asiatic sites; and I think one can safely affirm that within three or four years we will discover more of the origin of man than has been revealed during the past hundred.[507]

[506] Robert Broom to Franz Weidenreich, January 20, 1942. (W445, 11:F4, AMNH). Broom wrote: "It is interesting that I come to your conclusion that the Australopithecines and Hominids have come from a pre-Dryopithecus, by reasons different from yours."
[507] Broom, *The South African Fossil Ape-Men*, 143.

He concluded, "If the caves are worked as systematically as have been those at Chou Kou Tien the results will astonish the world."

Broom's monograph was reviewed positively and read widely. In the United States, William K. Gregory effused over the "splendid work of genius" that would spark further research in the area and open the door to foreign researchers engaging seriously with the South African fossils, as well as validating Raymond Dart's "truly epochal discovery" of 1924.[508] Sherwood Washburn commended Broom's systematic study of the expanded body of evidence, although he cautioned that Broom's inclination to assign the Australopithecines to the Pliocene period (even earlier than the Middle or Lower Pleistocene period that Broom and Dart had initially suggested) was not well-supported. However, Washburn conceded, if Broom could prove the Australopithecines were indeed that old, it would significantly help make the case for incorporating the "ape-men" into a structured, staged model of human evolution.[509] Loren C. Eiseley, writing for *Science*, ranked *The South African Fossil Ape-Men* as having comparable importance to Weidenreich's monograph on the skulls of *Sinanthropus*. This judgment was even more remarkable given that Broom had carried out most of the digging and examination work himself, without external financial support beyond the ordinary resources of the Transvaal Museum.[510]

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[508] William K. Gregory, review of *The Australopithecinae,* by Robert Broom, *The American Naturalist* 80, no. 795 (Nov-Dec 1946), 645-649. Gregory was even more enthusiastic than hometown journal *The South African Archaeological Bulletin*, which commended Broom and Schepers for their important work and firmly recommended against treating the work as light reading for anyone but a medical professional; Smuts' prefatory gloss was significantly easier to track for the lay reader. See A.G., review of *The South African Fossil Ape-Men: The Australopithecinae* by R. Broom, G.W.H. Schepers, *The South African Archaeological Bulletin* 1, no. 3 (July 1946), 85-86.

[509] S.L. Washburn, review of *The South African Fossil Ape-Men: The Australopithecinae* by R. Broom, G.W.H. Schepers, *American Anthropologist* new series 49, no. 2 (Apr.-Jun. 1947), 296-297.

[510] Loren C. Eiseley, review of *The South African Fossil Ape-Men: The Australopithecinae* by R. Broom, G.W.H. Schepers, *Science* new series 104, no. 2681 (July 26, 1946), 90.

By moving the Australopithecines earlier in geological time, from the Pleistocene into the preceding Pliocene era, Broom had "removed one of the main difficulties involved in regard [them] as lying near the human line of ascent." Additionally, Eiseley noted:

> South Africa has escaped the dread devastation of war. Where else can the student of human paleontology direct his attention during the next decade or so and expect greater reward for his labors? Dr. Broom has been on the ground and has seen the vision. It shines in the pages of his book.[511]

Even if Broom's claims proved to be less sound or revolutionary than he and others hoped, there was clear promise contained in the future study of South Africa's fossil formations. Exporting raw materials for the Allied war effort had strengthened South Africa's political ties to other countries, and improved its integration into world-wide transportation networks, especially the expanding trans-continental air service. At least as far as white European and American researchers were concerned, it would be easy to access fossil fields in South Africa. If only Broom and his paleoanthropological successors could secure adequate funding, the fossil fields of South Africa seemed to promise extraordinary future results.

The Pan-African Congress, Nairobi 1947

On December 14, 1946, Wilfrid Le Gros Clark left the UK on a three-leg, two-day air journey from London to Johannesburg, with over twenty-seven hours of flying time.[512] The goal of this marathon trip was to visit the Australopithecines in the flesh—or the bone, more accurately—and to see if Broom and Dart's claims for a close zoological relationship with

[511] Eiseley, review of *The South African Fossil Ape-Men*, 90.
[512] Wilfrid Le Gros Clark (henceforth WLGC) to his family, December 16, 1946. WLGC papers (Mss.Eng.lett.c.585 series IV, 14-37, Bodleian Library, Oxford) and entries of December 14-15, 1946 in WLGC South Africa journal, 1946-47 (Mss.Eng.misc.f.838, Bodleian Libraries, Oxford).

humans could be anatomically validated. Le Gros Clark—usually referred to by colleagues and in print as Le Gros—was one of the foremost experts in anatomy in Britain, and had chaired the anatomy department at Oxford since 1934, a year before he was elected a Fellow of the Royal Society at the relatively young age of 40.[513] His judgments held substantial weight, and when he reviewed Broom and Scheper's monograph positively in the summer of 1946, both the British and South African scientific communities took note.[514]

Le Gros Clark was also interested in the fragments of post-cranial material that had also been found in the breccia at Sterkfontein and Kromdraai. These included fragments of the humerus and ulna (arm bones) associated with *Paranthropus* and, even more excitingly, the lower end of a femur associated with *Pleisanthropus*. Yes, Le Gros Clark wrote, the skulls and teeth were important, but "so much depends on this limb material for a proper assessment of the Australopithecinae."[515] In the long term, the best way to tackle the problem of the Australopithcines was to simply continue excavations and see if more post-cranial material (or

[513] On Wilfrid Le Gros Clark, see Bernard Wood, "Sir Wilfrid Le Gros Clark: The Making of a Paleoanthropologist," in J.G. Fleagle and C.C. Gilbert, eds. *Elwyn Simons: A Search for Origins* (Springer, 2008), 19-33; Goran Strkalj, "Sir Wilfrid Le Gros Clark: The Sarawak Years," *Asian Biomedicine* 8, no. 3 (June 2014), 429-433; and Jesse Richmond, "Experts and Australopithecines: Credibility and Controversy in the Science of Human Evolution, 1924-1959" (Ph.D. dissertation, UC San Diego, 2009), ch 4 and 5. Bernard Wood makes the useful point that professionalization of physical anthropology took a different route in the UK compared to the US, and that professors of anatomy were the main ones doing this kind of physical anthropology work in the British context. Le Gros Clark completionists may also wish to read his Royal Society obituary, which is an exuberantly spiteful hatchet job by the primatologist and anatomist Solly Zuckerman, who spent most of the early 1950s vigorously disagreeing with Le Gros Clark's assessment of *Australopithecus*. See Lord Zuckerman, "Wilfrid Edward Le Gros Clark, 1895-1971," *Biographical Memoirs of Fellows of the Royal Society* 19 (December 1973), 216-233. Most of Le Gros Clark's papers are in the Bodleian Library, Oxford; correspondence relating to his arguments with Zuckerman in the early 1950s can be found in the Jacob Bronowski archives under the heading "Fossil Controversy," (Bronowski 5/3/3, Jesus College archives, Cambridge).

[514] W.E. Le Gros Clark, "Significance of the Australopithecinæ," *Nature* 157, no. 4000 (June 29, 1946), 863-865.

[515] Le Gros Clark, "Significance of the Australopithecinæ," 864.

any material, for that matter) turned up. In the short term, though, Le Gros Clark began making plans to visit Johannesburg and Pretoria and examine the fossils himself.

He arrived in Johannesburg on December 15, where Dart picked him up from the airport and brought him to his home in the northern suburbs. Postwar life in the southern hemisphere in the summer of 1946 was starkly different from Le Gros Clark's own existence in Oxford where wartime rationing was still in effect:

> When I awoke this morning to find the brilliant sunshine streaming in at my windows, and looked out to see a beautiful tropical garden blazing with cannas, hydrangeas, red hot pokers, moon-flowers and all the rest, it really did seem quite incredible to me.[516]

He spent his first few days visiting the medical school at Wits and intensively studying the Taungs skull—only one of the many fossilized anatomical specimens held in the anatomy department. There was also an enormous backlog of limestone breccia held in storage, still waiting to be analyzed, and even more material yet to be fully excavated, as Le Gros Clark discovered when he visited the Makapan Caves (Makapansgat), about 150 miles north of Johannesburg.[517] Describing the dig to his family, he wrote: "These deposits have been worked for limestone (used for agricultural purposes) & it was the result of blasting away the limestone which first led to the discovery of the fossils."[518] Touring through the caves, Le Gros Clark could see many places where the exposed layers of rock showed masses and masses of fossilized bone, closely packed together. There seemed to be enough fossil material to keep an army of paleontologists busy for many years at Makapansgat alone.

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[516] WLGC to his family, December 16, 1946. WLGC papers (Mss.Eng.lett.c.585) He also made frequent references to the vast quantities of butter and fruit available at table, and with Marjorie Dart's help purchased unobtainable luxuries like nylon stockings to send back home. (See WLGC to his family, December 19, 1946, Mss.Eng.lett.c.585.)
[517] WLGC entries for December 17 and 21, 1946 in South Africa journal, 1946-47 (Mss.Eng.misc.f.838).
[518] WLGC to his family, December 25, 1946, Mss.Eng.lett.c.585.

After a first week with Dart in the environs of Johannesburg and the Taungs skull, Le Gros Clark went up to Pretoria, where he stayed with a friend, David Evans, and spent several days working at the Transvaal Museum with Robert Broom. (Of Broom, Le Gros Clark wrote: "I have got to like the old chap very much indeed, & enjoy his company."[519]) Le Gros Clark even spent the entirety of Christmas in the museum, subsisting on sandwiches, although he did return to his friends' home for a proper Christmas dinner, followed by a trip to the world-famous Pretoria observatory to star-gaze. [520] "I work all day in the Museum studying [Broom's] fossil apes," Le Gros Clark wrote:

> And extremely interesting they are! In fact, it's worth coming out here just to see them alone. They are <u>really</u> most remarkable – but I mustn't go into anatomical details in this letter![521]

After ten days of steady work in Pretoria, Le Gros Clark and Broom drove back to Johannesburg, where they joined Dart on an expedition to work some of the sites where the "fossil apes" had been discovered, at Sterkfontein and Kromdraai.[522] They also visited another site near Gladysvale, where Broom had found another cave that was rich in fossil-bearing seams of rock. Despite the very hot weather, the Gladysvale site was beautiful—a river ran through the gorge nearby, filling several natural pools suitable for swimming, and Le Gros Clark remarked that the surrounding area was also used for camping and picnics. The relative accessibility of these promising fossiliferous deposits was another positive sign for the future growth of South African paleoanthropology. While driving home towards Johannesburg, Le Gros Clark also spotted some

[519] WLGC to his family, January 11, 1947, Mss.Eng.lett.c.585.
[520] See WLGC entries for December 23-30, 1946 in South Africa journal, 1946-47 (Mss.Eng.misc.f.838).
[521] WLGC to his family, December 25, 1946, Mss.Eng.lett.c.585.
[522] WLGC to his family, January 1, 1947, Mss.Eng.lett.c.585.

baboons on a hillside—another reminder of the range of living primate species that were native to this region of Africa.[523]

Le Gros Clark spent the remainder of his time in South Africa in Johannesburg, working on his notes on the Australopithecines and bathing in the Darts' backyard swimming pool. He did make one further day trip to Pretoria, on January 3, where he was granted a half-hour audience over tea with Smuts—whom he described as affable—at the Prime Minister's office.[524] On January 8, 1947, Le Gros Clark flew from Johannesburg to Nairobi for the Pan-African Congress in Prehistory, along with Dart, Broom, and sixteen other paleoanthropologists, archaeologists, and geologists from South Africa. [525] They were also joined by two delegates representing Bechuanaland (Botswana) and Southern Rhodesia (Zimbabwe).[526] The pilot indulged the interests of his passengers by going out of his way to do a low pass over Olduvai Gorge, although a similar plan to swoop over Ngorongoro Crater was scuttled due to cloud cover.[527]

Mary and Louis Leakey met the delegates at the Nairobi airport—Le Gros Clark noted that clearing customs was much simpler in Kenya than in South Africa—and swept Le Gros Clark and the others first to lunch and then to the Coryndon Museum, where Le Gros Clark spent the afternoon and the following morning studying the Leakeys' Miocene ape fossils.[528] On January 11, 1947, Le Gros Clark concluded a letter to his family in Oxford:

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[523] WLGC entry for December 31, 1946 in South Africa journal, 1946-47 (Mss.Eng.misc.f.838).
[524] WLGC entry for January 3, 1947 in South Africa journal, 1946-47, Mss.Eng.misc.f.838.
[525] WLGC entry for January 8, 1947 in South Africa journal, 1946-47, Mss.Eng.misc.f.838.
[526] Neville Jones was the representative from Southern Rhodesia, and the representative from Bechuanaland was none other than E.J. Wayland, who had left the Ugandan Geological Survey in 1943 to direct the Geological Survey of Bechuanaland.
[527] WLGC to his family, January 11, 1947, Mss.Eng.lett.c.585.
[528] WLGC entry for January 9 and 10, 1947 in South Africa journal, 1946-47, Mss.Eng.misc.f.838. See also Morell, *Ancestral Passions*, 142-143.

> The local paper "East Africa Standard" came out with great headlines this morning about the Congress & started off "A very important pronouncement, one which he has refused to describe or anticipate in any way up to the present, is expected to be made by Professor Le Gros Clark, FRS, of Oxford, one of the world's leading authorities on human evolution."[529]

He joked "Rather trying this -- I don't know how they got this idea, & I shall now have to think about what startling announcement I can make!"

All jokes aside, Le Gros Clark was in fact gearing up to make a significant pronouncement at the Congress, one based on his recent personal study of the fossil Australopithecines in South Africa and comparison work on the Kenyan early Miocene apes. His brief talk, titled "Anatomical Studies of Fossil Hominoidea from Africa," was scheduled in a symposium on January 20, 1947, on "Fossil Apes in Africa," which also featured talks by Dart, Broom, and Camille Arambourg.[530] The title referenced the recent classificatory work published in 1945 by American paleontologist George Gaylord Simpson (who was not present in Nairobi), who had used the term "Hominoidea" to connote a super-family of the Order Primates—and, in the same publication, also threw up his hands in frustration at the proliferation of genera assigned to every single fossil ape or man-ape that had appeared on the scene thus far.[531]

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[529] WLGC to his family, January 11, 1947, Mss.Eng.lett.c.585.

[530] See panel descriptions in L.S.B. Leakey and Sonia Cole, eds. *Proceedings of the Pan-African Congress on Prehistory, 1947* (Oxford: Basil Blackwell, 1952), vi. Le Gros was also a member of the committee on human paleontology, chaired by Alexander Galloway (a Scottish-educated anatomist who took university posts in Canada and South Africa before moving to Makerere College in Uganda in 1947); every other member of the committee was affiliated with Wits University in some way, excepting the American amateur Wendell Phillips. See entry for Sunday January 19, 1947 in WLGC South Africa journal, 1946-47 (Mss.Eng.misc.f.838). The journal concludes on January 19, one day before Le Gros was scheduled to give his talk, meaning that no remarks are preserved about that experience. He left Nairobi to return to London by air on January 25 (see letter from WLGC to his family, January 17, 1947, Mss.Eng.lett.c.585).

[531] George Gaylord Simpson, "The Principles of Classification and a Classification of Mammals," *Bulletin of the American Museum of Natural History* 85 (1945), 188. For example: "All specimens of fossil hominids that differ in any discernible way from *Homo sapiens*, and some that do not, have at one time or another been placed in different genera. Almost none of these anthropological 'genera' has any zoological reason for being. All known hominids, recent and fossil, could well be placed in *Homo*."

For his audience, Le Gros Clark laid out three possible interpretations of *Australopithecus*. The first option was that they were extinct apes, properly placed in the family *Pongidae* that were closely related to chimpanzees and gorillas. The second option was that they were extinct apes in the *Pongidae* family who were not actually closely related to chimpanzees and gorillas, but had diverged much earlier, and resembled them due to an astonishing case of parallel evolution. The third option, Le Gros Clark suggested, was to read the Australopithecines as "extinct hominoids" with simian-level brains who were still valid very early representatives of the "hominid sequence of human evolution."[532] Based on his studies, and those conducted by Broom, Schepers, and even Dart, Le Gros Clark was confident that options one and two could "now be certainly excluded." *Australopithecus* had to be somehow more closely related to humans than to the great apes.

There was no single element that was completely convincing on its own, but when the evidence of the cranial and facial structures and the structures of the Australopithecines' teeth was taken together, a compelling picture appeared. Furthermore, the discovery of the lower Miocene apes in Kenya helped Le Gros Clark fill out the patterns of hominin evolutionary radiation. The *Australopithecus* material was strengthened by the Miocene apes, and vice-versa. "If all the facts enumerated above are taken into consideration (and it is of the utmost importance that they should *all* be considered together as components of a total pattern)," Le Gros Clark concluded, then:

> …they only serve to reinforce the conclusions reached by Dart and Broom (on the basis of much more prolonged studies of their material) that the Australopithcinae represent an extinct group of the Hominoidea which must be associated with the line of hominid evolution rather than with that leading to the modern large apes, and which almost

[532] W.E. Le Gros Clark, "Anatomical Studies of Fossil Hominoidea from Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 111-115.

> certainly were closely related to (and perhaps survivors of) the ancestral stock from which *Homo* was derived.[533]

Le Gros Clark made the case for the relevance of *Australopithecus*, but he was only one of many speakers. The Congress was organized into three sections, each dealing with a major scientific division. Le Gros Clark's paper was a part of section II, "Human Paleontology," which was the smallest of the three sections. Section I concerned "Geology, General Paleontology, and Climatology," and began with a report by Arambourg in which he compared fossil fauna from his own excavations in the Omo valley with fossil beds from Olduvai and the Serengeti in East Africa, from caves and gravel terraces in South Africa, and from alluvial and sandstone deposits in Algeria and Morocco.[534] Surveying the distribution patterns, and considering the fossilized African fauna in relation to both living African species and fossilized fauna in the rest of the world, Arambourg concluded that, far from being a "refuge offered to the remaining Tertiary fauna," Africa was instead:

> …a center of evolution and dispersion from which certain groups, such as the Proboscidians, the Hyracoides, and some of the Artiodactyls, the Primates—and among them, the anthropoids and probably the Hominidae—have differentiated and have, at successive periods, migrated towards Eurasia.[535]

Africa was not an evolutionary cul-de-sac where primitive species had congregated and survived long past the point where their relatives died in the rest of the world, but instead a dynamic center of evolutionary development, one whose species had instead moved out and colonized the rest of the world. Certainly, some species had moved in the opposite direction. British

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[533] Le Gros Clark, "Anatomical Studies of Fossil Hominoidea from Africa," 113-114.
[534] Camille Arambourg, "The African Pleistocene Mammals," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 18-25.
[535] Arambourg, "The African Pleistocene Mammals," 25. The Proboscidians include elephants and their extinct relatives; Hyracoidea is the order that contains the small, rotund hyraxes. Examples of Artiodactyla (even-toed ungulates) include giraffes, hippopotamuses, pigs, and antelope.

paleontologist Dorothea Bate, affiliated with the Natural History Museum in London, described the Pleistocene mammal fauna from her own digs in Palestine, comparing them to known fossilized and living forms in both Asia and Africa and concluding that while a certain type of antelope had once been common in Asia, its living descendants were now only found in Africa.[536] Many of the other papers in section I dealt with climatological studies and problems of chronology: H.B.S. Cooke from the Wits geology department described climactic changes in relation to cultural stages in South Africa, for example, while E.J. Wayland returned to his former geological territory to discuss the dating of pluvial periods in Uganda's Kagera valley.[537]

Section III, the largest and most geographically comprehensive of the Congress sections, dealt with "Prehistoric Archaeology" from all parts of the African continent, including Morocco, British Somaliland, Egypt, the Anglo-Egyptian Sudan, Mozambique, Angola, Cape Verde, Bechuanaland, and Southern Rhodesia, as well as South Africa, Kenya, and Tanganyika. The speakers represented entities like the Archaeological and Anthropological Commission of the Sudan Government, or the colonial governments of the Belgian Congo or Northern Rhodesia, or the Institute Français d'Afrique Noire.[538] Like Wayland, these researchers were largely in the employ of colonial governments and colonial museums, and had often come to prehistory and archaeology through other forms of employment and training. Their papers were concerned with defining types of stone tools, and identifying regional and local patterns of cultural succession.

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[536] D.M.A. Bate, "The Pleistocene Mammal Faunas of Palestine and East Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 38-39.
[537] H.B.S. Cooke, "Quaternary Events in South Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 26-36; E.J. Wayland, "The Study of Past Climates in Tropical Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 59-66.
[538] Some randomly chosen examples: A.J. Arkell (Sudan Government and Archaeological and Anthropological Commission); Dr. F. Cabu (Government of the Belgian Congo and the Musée du Congo Belge); J. Desmond Clark (Government of Northern Rhodesia and the Rhodes-Livingstone Museum); Prof. Th. Monod (IFAN and MNHN-Paris).

Dating was still only relative, but many of the speakers reached the same general conclusions, that there were many types of stone tool cultures in Africa that were of significant age, that these African stone tools appeared at earlier points in time than comparable tools in European strata, and that these tools showed progressive development and refinement from simple to complex types that took advantage of the different characteristics of specific types of rock. Finally, the sub-committee on prehistoric archaeology also voted to discontinue using the terms with which they had previously described the major cultural succession of Paleolithic Africa.[539] Rather than attempting to fit each African tool culture into a precise European Paleolithic typology (whose names referenced different prehistoric sites in France), everything would now simply be called "Chelles-Acheul" plus the appropriate local regional term (i.e. a Stellenbosch Chelles-Acheul type or a Kagera Chelles-Acheul type). The term Pre-Chelles-Acheul technically encompassed the terms Kafuan and Oldowan, coined by Wayland and Leakey to describe the even simpler stone tools they had discovered; sub-section 7 of the resolution suggested that these terms be retained for describing the earlier and later Pre-Chelles-Acheul cultural stages (again, with suitable regional qualifications). This moved the field from treating the European stone tools as emblematic types, and established the Kafuan and Oldowan as typological designations that could be applied throughout Africa.

In the concluding sessions, the delegates voted to continue holding Pan-African Congresses every four years, and adopted a series of resolutions calling on the "governments of African territories" to take steps to establish both official geological and archaeological surveys,

[539] Resolution No. 16 (Based upon the Report of Sub-Committee on Prehistoric Archaeology held at 4.30 pm on Tuesday, January 21st, 1947), in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 8-9.

and to sufficiently fund both well enough to keep the research going.[540] Future work would depend on prolonged official support from the governments of the African colonial territories—support that all the attendees agreed should be tendered to Leakey and his fellow researchers without delay. Both organizers and participants judged the Congress was judged an enormous success. They especially enjoyed the tours out into the countryside organized by Leakey to see the Great Rift Valley, Lakes Naivasha and Elmenteita, and beautiful, ancient rock paintings.[541] The Congress also bore significant dividends for Leakey and Dart, as their formerly incredible fossils and preposterous hypotheses were placed in context by the work of other researchers, and in large part validated by the systematic, trustworthy work of a larger population of colonial surveyors and university geologists. The Congress enabled Dart and Leakey to act their parts as credible scientists and defend their claims before a large audience of their peers, in a way that was impossible when their primary forms of international intellectual engagement had been through the medium of flamboyant claims in letters to the editors of *Nature*.

The papers on *Proconsul* and *Australopithecus* stood out, partly because the evidence suggested answers to some important open questions in the field, partly because hominin fossils were so rare. (If hominin fossils had been plentiful and stone tools scarce, the prehistoric archaeology section of the Congress probably would have garnered the most attention from the participants, public, and the press.) Leakey and Dart, however, were not so rare – they were part of a much larger network of mixed professionals and amateurs who had spread out over the

[540] Of 17 total resolutions, ten called on specific governments to support geology and prehistoric archaeology. Resolutions were addressed to Angola, the Belgian Congo, the governments of the East African territories, Nigeria, the Rhodesias and Nyasaland, Somaliland, French West Africa, Egypt, Mozambique, and his Imperial Majesty Haile Selassie, the Emperor of Ethiopia.
[541] See WLGC entries January 12-19, 1947 in South Africa journal, 1946-47, Mss.Eng.misc.f.838. The primary difficulty the congress participants encountered was a tendency for the official cars to overheat when trying to get up steep hills.

African continent during the interwar period, before the Nairobi Congress brought them all together.

Conclusion

After the Congress concluded on January 23, Kenneth Oakley headed out on a "1000-mile safari into Tanganyika," to see the famous Ngorongoro Crater and Olduvai Gorge and gather geological and archaeological specimens for the Natural History Museum in London.[542] After looping back through Nairobi, where he stopped briefly to pack specimens and make notes at the Coryndon Museum, he left next for Rusinga Island in the company of Mary and Louis Leakey and Dorothea Bate, and visited the original site where *Proconsul* had been found. Next, he went out with the Kenya Geological Survey to examine glacial gravels near Mt. Kenya and gather mineral samples, volcanic ash, and high-altitude plants. When Oakley went to catch the train from Nairobi to Mombasa on March 1st, he had nearly 750 pounds of specimens in his packing cases – 500 pounds over the free allowance. "After much discussion with Station master," he wrote in his diary, "it was agreed to declare them as 'Old stones and bones for Museum'" which allowed them to travel at a lower shipping rate than rock samples, "which might after all include something *valuable* like marble, I was told."[543] The return by boat to Britain took twenty days, although Oakley made the most of a short stop at Aden to explore volcanic formations from the Pleistocene period.

[542] K.P. Oakley, "Report on Visit to East Africa, Jan.-Mar. 1947." Mss OAK Notes 8.1 (NHM London).
[543] K.P. Oakley, "Report on Visit to East Africa, Jan.-Mar. 1947." Mss OAK Notes 8.1

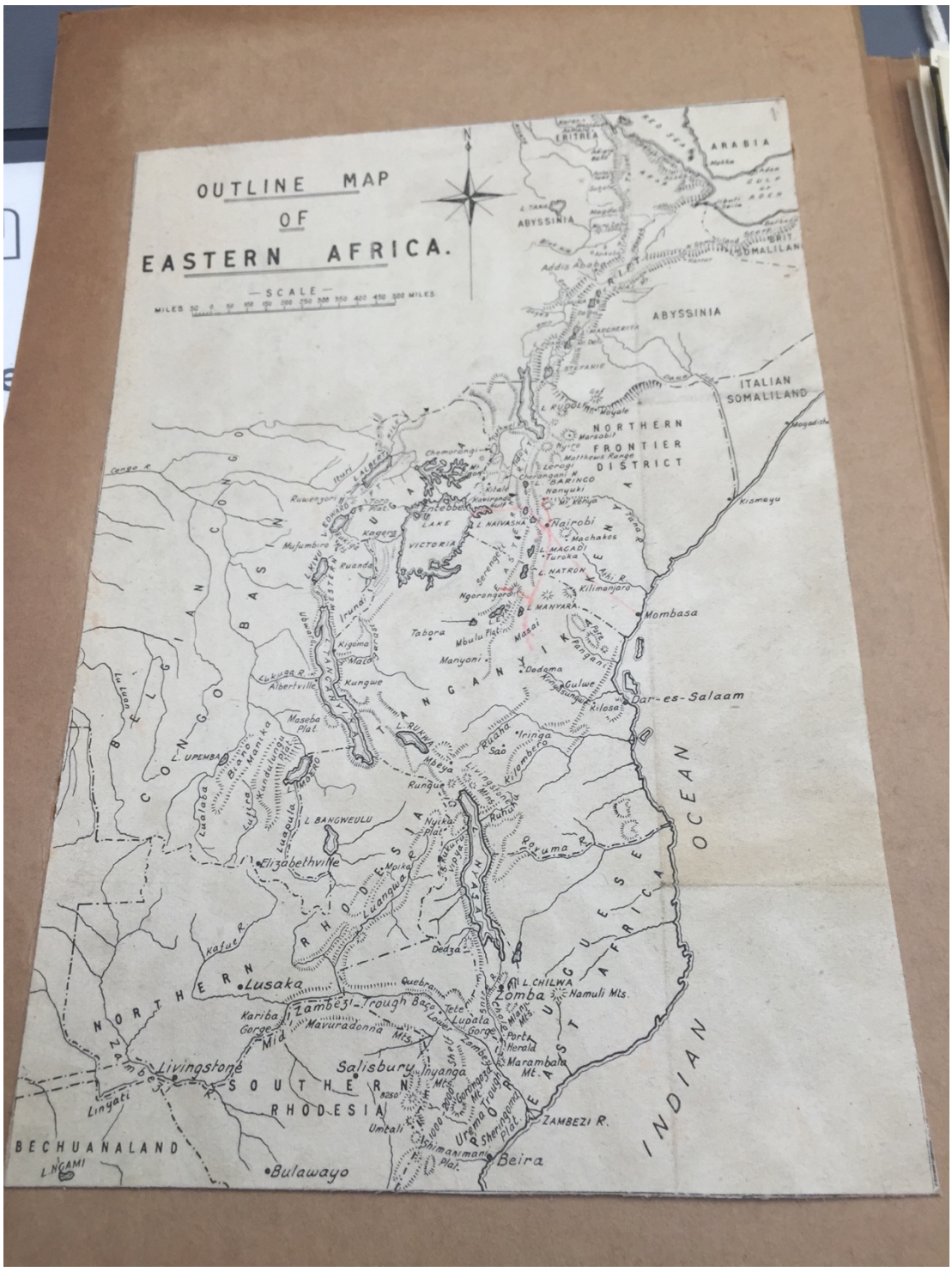


Figure 14 Map of East Africa, inside the folder cover in Kenneth Oakley's notes on the Pan-African Congress of 1947. (MSS OAK Notes 8.1--KP Oakley Trip to East Africa 1947, NHM London.)

All told, Oakley's trip to the Pan-African Congress resulted in more than 200 mammalian fossils for the Natural History Museum, as well as fossils of fish, plants, crocodiles, arthropods and gastropods, and an extensive set of rock collections for the museum's Mineral Department. This was hardly the first time that an extensive collection of specimens from East Africa had made their way to the NHM, but Oakley's travels show how the Congress opened another opportunity for British experts to engage with the natural history of East Africa, which provided more opportunities to validate or otherwise shore up the conclusions that had been drawn about the long history of the region and its importance to understanding the history of the human race.

In late March 1947, Oakley returned to the Natural History Museum in London after spending three months in East Africa.[544] Originally, the Congress had been organized to bring together researchers who were broadly interested in problems of African prehistory and geology, to share information, discuss common nomenclature for geological strata and cultural artefacts, and strengthen personal and professional connections among specialists working in the same region of the world. However, as Oakley wrote in a report for the Natural History Museum, the papers and discussions at the Congress had also covered another high-profile subject of research—namely, "the latest discoveries which throw light on the origin of man."[545]

"I was asked the other day," began Oakley in an undated report written sometime after his return to Britain, "'Is it true that the Garden of Eden was really in Africa?'

> I could only reply that this was not the language of scientists, but if one put the question this way: "Does the available evidence indicate that *Homo sapiens* first appeared in Africa rather than in Asia?", then I would say: "In my personal view, yes."[546]

[544] K.P. Oakley, "Report on Visit to East Africa, Jan.-Mar. 1947," Mss OAK Notes 8.1. NHM.
[545] K.P. Oakley, "The Origin of Man," undated but probably April 1947. Mss OAK Notes 8.1.
[546] Oakley, "The Origin of Man," 1. Mss OAK Notes 8.1.

Having heard and seen the evidence for himself at the Congress, and at Nairobi's Coryndon Museum, Oakley had built what he described as a reasonable "working hypothesis" of human origins. Although this hypothesis would necessarily be tested by future discoveries, Oakley believed the available evidence strongly suggested that humanity had first emerged somewhere on the African continent, and outlined the three constituent parts of his thesis.

First, anatomists, anthropologists, and other scholars of human evolution had rejected the language of a "missing link" between humans and apes. Instead, they sought to identify a "last common ancestor of apes and man," after which point the ape and human lines had diverged in separate directions. Over the course of expeditions at sites in East Africa, Leakey and a changing cast of co-explorers that included Mary Leakey and Arthur Tindall Hopwood had unearthed fragmented fossilized jawbones that appeared to belong to a type of ape dating to the Miocene period—the geological era where this last common ancestor would most likely be found.

Second, researchers in South Africa had discovered fossil evidence of speciation in the hominin line—a small-brained fossil "man-ape" that had been dubbed *Australopithecus* by Raymond Dart in 1924. This evolutionary progression of what Oakley dubbed "Proto-men" had probably had many such offshoots, including some who had probably "migrated into Asia," giving rise to the "specialized, brutish creatures, with low skulls and beetling eye-brow ridges – the Pekin, Java, and Neanderthal Men," who flourished briefly in the Ice Age conditions, building tools and burying their dead before going completely extinct themselves.

"Where did *Homo sapiens* come from?" Oakley then asked. "It begins to look as though he may have evolved from the Proto-men who stayed home in Africa."[547] By examining successive layers of geological deposits in Olduvai Gorge in Tanzania, as well as sites in Central

[547] Oakley, "The Origin of Man," 2. Mss OAK Notes 8.1.

Africa, researchers like Mary Leakey had tracked a cultural progression from chipped "pebble-tools" all the way to the "pear-shaped stone tools called 'hand-axes,'" which had been discovered in almost every part of Africa. "The extraordinary fact," wrote Oakley, was that identical stone hand-axes had also been unearthed in western Europe, but in geological strata that appeared to be much more recent than those which held similar tools in Africa. "There is good evidence," he concluded, "that the makers of hand-axes spread from Africa into Europe."[548]

This, then, was the case for Africa. It was not that a single find, whether paleontological or archaeological, shifted the balance of international scientific opinion. It was not just that the last common ape-human ancestor had lived in Africa, or that an early "man-ape" had apparently lived in Africa, or even that a particularly advanced Stone Age tool culture had appeared in Africa before it appeared in Europe. Instead, the pivot to Africa was made possible and plausible by the conjunction of all three forms of evidence, each undergirded by large-scale surveys of the African geological landscape that allowed these discoveries to be placed on one common map.

In short, it was the combination of *Proconsul*, *Australopithecus*, and abundant stone tools that had convinced Oakley that Africa was the site of human emergence rather than Asia. Each piece of new data could be related to similar evidence in other parts of the world, but the African examples consistently seemed to appear in earlier geological horizons. There was evidence for the right kinds of climate shifts that could have produced conditions that motivated some ancestral hominins to leave the trees and walk on the grasslands, and from this evidence, Oakley felt that it was reasonable to construct his hypothesis. It was not just that the ape and human lines had diverged for the first time in Africa, and then "proto-men" had transformed into true "men" elsewhere (either singly or multiple times, as Franz Weidenreich had suggested in his study of

[548] Oakley, "The Origin of Man," 2. Mss OAK Notes 8.1.

Sinanthropus). Rather, the successive layers of geological, paleontological, and archaeological evidence led Oakley to believe that these transformations had happened successively in Africa. The Australopithecines alone were not sufficient: it was the gradual accretion of information on all three levels that began to swing the balance in favor of Africa. Furthermore, empire made that knowledge-production possible.

Chapter 4. ONE SPECIES, UNDER THE BOMB

GLOBALIZING THE HUMAN PAST IN THE COLD WAR

At the Pan-African Archaeological Congress in 1947, many discussants returned repeatedly to problems of chronology. Where, for example, was the boundary line between the Pliocene and Pleistocene periods?[549] How did the historical rainy periods (or pluvials) of Uganda and Kenya align with glaciation patterns in the Alps or the Himalayas?[550] If so, was it possible to use evidence of past climate shifts to correlate finds between different continents? The picture of the long sweep of primate and hominin evolution that emerged in the Congress discussions strongly supported the conclusion that Africa was the site of the emergence of the human species, and that this emergence had taken place approximately at the end of the Pliocene period—although, as archaeologist Frederick Zeuner pointed out in his own presentation, what "late Pliocene" or "early Pleistocene" meant in absolute chronological terms was impossible to define. In his 1926 book *The Stone Age in Rhodesia*, Neville Jones (another Congress attendee) described the range of estimates given by eminent international scientists for the approximate beginning of the Pleiostocene period; their answers ranged from 10,000 to 1.6 million years ago.[551] The collective evidence for Africa was highly compelling, but how long ago had this human emergence occurred? Congress participants agreed that the fossils and stone tools seemed

[549] F.E. Zeuner, "The Plio-Pleistocene Boundary," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 55-59.
[550] Erik Nilsson, "Pleistocene Climatic Changes in East Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 45-55; E.J. Wayland, "The Study of Past Climates in Tropical Africa," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 59-66; and F.E. Zeuner, "Mediterranean and Tropical Pluvials," in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 66-69.
[551] Neville Jones, *The Stone Age in Rhodesia* (London: Oxford University Press, 1926), 14-15. Henry Fairfield Osborn and Arthur Keith, at 500,000 years and 200,000 years respectively, were near the middle of the pack.

to appear in Africa in lower strata than they did in Asia and Europe, but these estimates were relative, not absolute.

In the late 1940s, researchers in the United States and Britain developed several new chemical and radiometric dating techniques that allowed prehistorians and paleoanthropologists to begin placing human artifacts on an absolute timescale. The most famous and far-reaching of these dating technologies was radiocarbon, or carbon-14 dating. Radiocarbon dating relies on measuring the decay of radioactive carbon-14 in a specimen composed of formerly live organic material. Carbon-14 is naturally occurring and is absorbed by organisms while they are alive; because it is radioactive, the half-life can be used to calculate the time elapsed since the organism's death.[552] For the first time, it was possible to establish the chronological progression of the human species, tracking cultural developments and population migrations across the landscape of prehistoric time.

The development of radiocarbon dating coincided with a moment of powerful political commitment to a singular human species and a unified, and peaceful, world, and for the first time made meaningful age comparisons possible among materials gathered all over the world. The United States had emerged from the Second World War as the leading economic and scientific power, and, until the Soviet nuclear test in 1949, also held the distinction of being the only country in the world in possession of nuclear weapons.[553] Europe was slowly digging itself out of

[552] R.E. Taylor and Ofer Bar-Yosef, *Radiocarbon Dating: An Archaeological Perspective*, 2nd ed. (Walnut Creek, CA: Left Coast Press, 2014). It remains the most "securely established and widely used scientific method of obtaining chronometric age," with an upper limit of 60,000 years.

[553] On American postwar geopolitical and scientific power, see discussion in: Alfred Eckes and Thomas Zeiler, *Globalization and the American Century* (New York: Cambridge University Press, 2003); Victoria de Grazia, *Irresistible Empire: America's Advance through Twentieth Century Europe* (Cambridge: Belknap Press, 2005); John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge: The MIT Press, 2006); and Naomi Oreskes and John Krige, eds., *Science and Technology in the Global Cold War* (Cambridge: The MIT Press, 2014).

rubble and reassessing its place in the world, as colonial empires disintegrated and the nations on the continent were drawn into two opposing camps, NATO and the Warsaw Pact.[554] A new international order, in the form of the United Nations, was rising, with the power to intervene, if in only small ways, in international and imperial conflicts, such as the Dutch withdrawal from Indonesia in 1948 and 1949.

The postwar internationalism of the United Nations coexisted with the rising tensions of superpower conflict in the Cold War, and with it, the threat of imminent nuclear annihilation, or other more insidious forms of radioactive hazard that could endanger the entire planet. Radiocarbon dating was a product of this new nuclear world—designed by a veteran of the Manhattan Project, and dependent on Atomic Energy Commission-produced isotopes to calibrate and test the measuring apparatus. Researchers were suddenly able to throw significant new light on the depths of human prehistory all around the world—but that light was produced by the Nuclear Age.

At the same time that radiocarbon dating was being developed, the French historian Lucien Febvre returned to his colleagues at the French National Commission to the United Nations Educational, Scientific, and Cultural Organization (UNESCO) with a report from the 1948 General Assembly.[555] Among the hundreds of resolutions that made up the future UNESCO program, Febvre wanted to draw his colleagues' attention to one very large project that encapsulated the values that UNESCO most wanted to promote. If UNESCO was meant to "defeat war in the minds of men," as its founding documents stated, it would need to create a

[554] See Odd Arne Westad, *The Global Cold War: Third World Interventions and the Making of Our Times* (New York: Cambridge University Press, 2005); Tony Judt, *Postwar: A History of Europe Since 1945* (New York: Penguin, 2005).
[555] Lucien Febvre, "Report of the Beyrouth Conference to the French National Commission," *Notes et Études documentaires*, no. 1080, 26 February 1949, 9-13, 19.

new basis for humans to relate to each other and to their own past. This proposed "history of peaceful relations" would begin with the evolution of the human species and its first tools, languages, and cultures, and then trace human development through a subsequent five volumes, up to the present day. Above all else, wrote Febvre, the project was meant to highlight the "unity of civilization." In short, UNESCO wanted a new history textbook that could save the world. Equipped with new theories, new data, and a powerful new technology, paleoanthropology and prehistory seemed ready to rise to the challenge.

The "science of man" had always been a worldwide problem; now the "politics and governance of man" became a worldwide problem too. The attention paid to human unity and shared goals made sense in the aftermath of a worldwide conflict, but it also took on a special urgency in the context of active fears about nuclear war. As Orville Prescott wrote in a book review for the *New York Times* in 1954, "The more hair-raising the possibilities of tomorrow's history become, the more eagerly scholars turn to the examination of past history."[556] Readers, he continued "hope to find in the long story of mankind some clue to the immediate future. How comforting it would be, for instance, if we felt sure that we would not blow each other up!"

Even if the United States and the Soviet Union could avoid starting a nuclear third world war, there were other conflicts brewing, and plenty of sites where the clash between the rhetoric of postwar human unity and equality, and the reality of imperial politics became especially apparent. While the radiocarbon dating and UNESCO world history projects were framed as the work of objective individual scientists and co-equal nation-states, these projects developed through inter-imperial collaboration, and their development was constrained by pre-existing

[556] Orville Prescott, "Books of the Times," *The New York Times*, December 8, 1954. Accessed electronically May 25, 2017. The book under review was Carleton Coon, *The Story of Man: From the First Human to Primitive Culture and Beyond* (New York: Knopf, 1954).

networks—although both the break-up of the formal European empires and the development of the global Cold War affected how power, knowledge, and resources moved from point to point. These projects were not an escape route from imperial geopolitics—they were built by imperial geopolitics. Neither radiocarbon nor universal history could bring about the actual arrangement of world power or the community of nations and peoples that their rhetorical construction suggested should already exist.[557]

Both the radiocarbon dating project and the UNESCO world history project sought literally and metaphorically to unite the world. By putting human history on a single timeline, prehistorians and paleoanthropologists could finally study human evolution and the emergence of culture as a world-wide phenomenon. However, both projects were full of conflicts and contradictions—over how international science should be organized and practiced, over how global collaboration should be achieved, and over what it meant to be human in the aftermath of global war.

Dating the Past

On the evening of January 9th, 1948, Willard F. Libby presented a paper "Archaeological Ages by Natural Radiocarbon" at a "Supper-Conference for Anthropologists" hosted in New York City at the headquarters of the Viking Fund (soon to be re-named as the Wenner-Gren

[557] Both Mark Mazower and Susan Pedersen have analyzed the political and ideological role of empire in the League of Nations and the United Nations. See Susan Pedersen, *The Guardians: The League of Nations and the Crisis of Empire* (Oxford: Oxford University Press, 2015); Mark Mazower, *No Enchanted Palace: The End of Empire and the Ideological Origins of the United Nations* (Princeton: Princeton University Press, 2009); and Mark Mazower, *Governing the World: The History of an Idea* (New York: Penguin Press, 2012). On anti-imperial conflict in the late 1940s and 1950s, see C.A. Bayly and Tim Harper, *Forgotten Wars: The End of Britain's Asian Empire* (New York: Allen Lane, 2007), and Matthew Connelly, *A Diplomatic Revolution: Algeria's Fight for Independence and the Origins of the Post-Cold War Era* (New York: Oxford University Press, 2002).

Foundation).[558] He began by describing the process of cosmic radiation bombardment that produces neutrons in the high atmosphere, which in turn react with atmospheric nitrogen to form carbon-14. Since the rates of neutron production had been measured by physicists, the amount of radiocarbon on earth could be calculated, assuming all the neutrons formed radiocarbon, and that the production and disintegration of radiocarbon on earth were in equilibrium. If the specific radioactivity of carbon all over the earth's surface was the same (as Libby suspected it was), and that the rates of carbon-14 production had stayed consistent over the past 50,000 years, it "seems extremely likely that the measurement of the specific activity of buried materials will indeed give the elapsed time since the body was removed from the life cycle, i.e. since the time of death." Direct measurements without isotopic enrichment could be expected to give values back to 10,000 years. With further sample enrichment, it was possible that the method could be used to date organic materials back to as much as 40,000 years. Human culture could have an absolute timeline.

The problem of chronology, absolute dating, and available time had dogged evolutionists since the mid-nineteenth century. In the late 1860s, less than a decade after Darwin published *On the Origin of Species*, the eminent British physicist and engineer William Thomson, who would become Lord Kelvin in 1892, attempted to calculate the age of the earth. Using his expertise in thermodynamics and the estimated rate of cooling of the earth from a molten state, Thomson concluded that the planet could be no more than 100 million years old, which greatly reduced the available amount of time for the emergence of life in any form, not to mention the evolution of

[558] Willard F. Libby, "Abstract of paper Archaeological Ages by Natural Radiocarbon Content," Frederick Johnson papers, Box 2, "Committee on Carbon 14, Miscellaneous." UCLA Library Special Collections.

large and biologically complex species.[559] After Marie and Pierre Curie announced the discovery of radioactivity in 1903, the American researcher Bertram Boltwood was the first to propose dating geological samples through measurement of radiogenic lead deposits in a paper published in 1907.[560] By the early 1930s, radiometric dating techniques, mostly based on the uranium decay series, had allowed geologists to establish the age of the earth as significantly greater than Thomson's mid-nineteenth century estimates. Exact numbers, however, remained elusive. Dating the rocks surrounding a fossil find did not necessarily establish the age of the fossil except in specific cases, and while the temporal range of uranium-dating methods was useful for estimating the age of the planet, it was not precise enough to work on briefer evolutionary timescales.[561] Natural radioactivity could become a clock, but it had to be one that scientists could easily read.

Prehistoric archaeologists commonly classified stone tools in relation to a series of cultural strata that had been excavated at sites in France in the nineteenth century, where flint tools could be established to predate worked bone or antler tools. The cultural stages were named for specific sites in France—Le Moustier (flint), in the Dordogne, and Aurignac (bone), in the Haute-Garonne—but also became classificatory type-examples, which could then be exported and used to classify prehistoric tools all over the world, if it was assumed that all human cultures

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[559] William Thomson, "On the Secular Cooling of the Earth," *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science*, fourth series (January 1863), 1-14. On Thomson (Lord Kelvin), and his thermodynamic work, see Crosbie Smith and M. Norton Wise, *Energy and Empire: A Biographical Study of Lord Kelvin* (Cambridge: Cambridge University Press, 1989). J.D. Burchfield argues that Thomson's calculations, like those of many of his interlocutors, were essentially only guesswork estimates that were given an appearance of false precision, at least in part to score points against the evolutionists. See Joe D. Burchfield, *Lord Kelvin and the Age of the Earth* (New York: Science History Publications, 1975).

[560] Bertram B. Boltwood, "On the Ultimate Disintegration Products of the Radio-active Elements. Part II: The Disintegration Products of Uranium," *American Journal of Science* 23, no. 134 (Feb. 1907), 77-88.

[561] For discussion of the distinction between relative and absolute dating, and the importance of this distinction when estimating the age of fossil finds, see Kenneth P. Oakley, *Frameworks for Dating Fossil Man* (London: Weidenfeld and Nicolson, 1964).

had proceeded through identical stages of tool development and cultural production. Establishing correlations between different regions based on their tool development was, however, much more difficult than it seemed. "Prehistory itself helps very little," wrote Chinese paleoanthropologist W.C. Pei in 1939, when he attempted to correlate the geology and prehistory of China and Europe, "the workmanship of the stone implements of these two regions being too different."[562] One of Louis Leakey's early interventions was to argue that nowhere in Africa did the "true Aurignacian of Aurignac" occur, and that it was nonsensical to retain the term either in an absolute chronological sense, or as a way of putting Kenyan Paleolithic cultures into a trans-continental continuum.[563] By 1949, as one review article put it, the majority of workers in prehistory deemed it "abundantly clear" that the "classical sequence" of Paleolithic cultural succession in Europe was not necessarily applicable outside that continent.[564] For the purposes of attempting to understand historic human evolution and migration patterns, one of two things would have to happen. Either relative dating systems had to be consistent over very large and geologically different parts of the world, or an absolute dating method that did not rely on stratigraphic comparisons would have to be developed.

Willard Libby was neither a prehistorian nor a paleoanthropologist. Instead, he was a chemist with a knack for developing systems for counting low-level radioactivity. After completing his PhD at Berkeley in 1933, Libby joined the department as an instructor and later professor of chemistry, where he focused on naturally occurring radioactivity and, especially, on

[562] Wen-Chung Pei, "An Attempted Correlation of Quaternary Geology, Palaeontology, and Prehistory in Europe and China," Institute of Archaeology, University of London, Occasional Paper no. 2 (1939), 13. Miles Crawford Burkitt papers, GBR/0012/MS Add.7959, box 3. Cambridge University Library.
[563] L.S.B. Leakey, "Capsian or Aurignacian? Which Term Should Be Used?" in Leakey and Cole, *Proceedings of the First Pan-African Congress*, 205-206.
[564] Hallam L. Movius, Jr., "Old World Palaeolithic Archaeology," *Bulletin of the Geological Society of America* 60, no. 9 (September 1949), 1443-1456.

identifying isotopes of known elements.[565] For obvious medical and biological reasons, finding a radioactive isotope of carbon was particularly desirable. At Berkeley, Sam Ruben, Martin Kamen, and William Zev Hassid began looking closely at carbon isotopes that could be used as radioactive tracers.[566] (Ruben was one of Libby's graduate students.) Hassid, Kamen, and Ruben initially published on carbon-11, which had a half-life of about twenty minutes—feasible, but a little short for the research into photosynthesis that the group hoped to undertake. Experimental data suggested that the half-life for the as-yet un-isolated carbon-14 isotope would be about three months, which was a much better decay rate for a photosynthesis tracer, and Ruben continued to work on creating a sample of carbon-14 in the Berkeley cyclotron.[567] Together with Kamen, Ruben successfully isolated and analyzed carbon-14 in 1940. The half-life turned out to be much greater than either Ruben or Libby had suspected; in fact, Kamen and Ruben's initial calculations returned an approximate half-life of 4000 years, revised in later experiments to 5568 years.[568] Developing radiocarbon for research use, however, was put on hold when the United States entered the Second World War in 1941, and the Berkeley researchers were mobilized for different kinds of war work. Ruben and Kamen were pulled into research on chemical weapons and uranium separation, respectively, before Ruben was killed in a laboratory explosion in 1943. Libby, who had been on sabbatical at Princeton at the time of Ruben and Kamen's discovery, joined the Manhattan Project, and then moved to the University of Chicago after the war.

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[565] Interview of Willard Libby by Greg Marlowe on 1979 April 12, Niels Bohr Library & Archives, American Institute of Physics, College Park, MD USA, www.aip.org/history-programs/niels-bohr-library/oral-histories/4743-1

[566] Angela Creager, *Life Atomic: A History of Radioisotopes in Science and Medicine* (Chicago: University of Chicago Press, 2013), 227-230.

[567] Libby AIP interview, session 1.

[568] Creager, 229. Current (2017) experimental data gives the half-life of carbon-14 as 5730 years.

At Chicago, Libby continued to focus on nuclear chemistry, while working through some questions related to radiocarbon on the side. In early 1947, he published a paper in *Science* with several co-authors that discussed the natural production of radiocarbon in the environment as a by-product of cosmic radiation. [569] The paper analyzed the carbon-14 in two samples of methane, one taken from petroleum sources and the other collected from naturally-occurring bio-methane in the Baltimore sewers. The petroleum-sourced methane showed no carbon-14 activity, which was to be expected; given the vast age of the petroleum deposits, the isotope would have long passed the point where the carbon-14 decay activity would be measurable. The "young" bio-methane, however, showed amounts of carbon-14 that aligned with the amounts that would be predicted if carbon-14 was being naturally created through cosmic ray bombardment of the upper levels of the earth's atmosphere.

Libby and his co-authors were careful to note that it was conceivable that the Baltimore sewer carbon-14 could have come from non-natural sources, although they thought the possibility was very remote. [570] At the time of sample collection, the only source of artificially-produced radiocarbon in the country was the Atomic Energy Commission, and records showed that none of the AEC's carbon-14 had been sent to anyone in Baltimore. It was also conceivable that the bio-methane carbon-14 could have originated in an atomic pile, or an atomic bomb, but again, the amount of radiocarbon that was detected was in line with expected values for natural production, and the amount of naturally-occurring radiocarbon that should be present in the atmosphere was much larger than the amount that could be produced in any laboratory or government reactor at the time. Therefore, it seemed that the radiocarbon that Libby was

[569] E.C. Anderson, W.F. Libby, S. Weinhouse, A.F. Reid, A.D. Kirshenbaum and A.V. Grosse, "Radiocarbon from Cosmic Radiation," *Science* 105, no. 2735 (May 30, 1947), 576-577.
[570] Libby et al. (1947), 576.

measuring in the environment was naturally-occurring, and had been present on earth for a long time. The next major challenge was to determine the precise half-life of carbon-14. Libby, drawing on both his Manhattan Project connections and his status as one of the most prominent nuclear chemists in the United States, got a purified sample of radiocarbon from the AEC reactor at Oak Ridge, and experimentally determined that radiocarbon had a half-life of 5568 years, plus or minus 30 years.[571]

In the spring and summer of 1947, small discussions took place at Chicago among members of the chemistry and anthropology departments. Harrison Brown, a professor of chemistry, suggested to the anthropologist Fay-Cooper Cole that it might be possible to date archaeological materials by measuring their absorbed radium content, while Libby thought the same goal might be possible with radiocarbon. These conversations eventually grew to include not only Libby, Brown, and Cole, but also the nuclear chemist Harold Urey, anthropologists Fred Eggan, Sol Tax, and Kenneth Orr, and archaeologist Robert Braidwood.[572] In a side-by-side comparison of the radiocarbon and radium dating hypotheses, written by anthropology graduate student Robert Merrill in the summer of 1947, radiocarbon easily beat out radium as the target isotope of choice. It was absorbed consistently by living organisms over the course of their lifespan, and then disintegrated into stable, identifiable isotopes. Radium was not consistently

[571] Interview of Willard Libby by Greg Marlowe on 1979 April 16, Niels Bohr Library & Archives, American Institute of Physics, College Park, MD USA, www.aip.org/history-programs/niels-bohr-library/oral-histories/4743-2; Frederick Johnson, "Introduction," in Frederick Johnson, ed. "Radiocarbon Dating," *American Antiquity*. Memoirs of the Society for American Archaeology 17, no. 1, part 2 (July 1951). On Oak Ridge and the AEC, see Creager, *Life Atomic*.

[572] Robert S. Merrill, "A Progress Report on the Dating of Archaeological Sites by Means of Radioactive Elements," October 20, 1947. Frederick Johnson papers, Box 2: "Committee on Carbon 14, Miscellaneous." UCLA Library Special Collections. (Henceforth abbreviated as FJ, UCLA.) Merrill's report was later published; see Robert S. Merrill, "A Progress Report on the Dating of Archaeological Sites by Means of Radioactive Elements," *American Antiquity* XIII, no 4 (April 1948), 281-286. For a detailed history of the internal negotiations at Chicago between the chemists and the anthropologists, see Greg Marlowe, "Year One: Radiocarbon Dating and American Archaeology, 1947-1948," *American Antiquity* 64, no. 1 (January 1999), 9-32.

absorbed by all living things, and could also be the decay product of heavier radioactive elements—although it did have the advantage that it could be used to date inorganic materials. The problem of refining the technical processes of sample preparation, radioactivity measurement, and mitigating sample contamination, Merrill wrote, would fall largely to chemists and physicists.[573] Anthropologists and archaeologists, though, were involved from the outset in the radiocarbon dating development process.

After his address to the Viking Fund in January 1948, Libby requested assistance from the organization to put together a committee of archaeologists who would help him develop radiocarbon dating as a scientific tool.[574] He also applied to the Viking Fund for a grant of $40,000 for radiocarbon work, which he received in 1949.[575] The Radiocarbon Committee members were appointed by the American Anthropological Association, and consisted of Froelich Rainey from the Penn Museum in Philadelphia, Donald Collier at the Field Museum in Chicago, and Frederick Johnson from the Peabody Museum in Andover, Massachusetts, who served as the committee chairman and later as the unofficial historian of the radiocarbon enterprise. They began with selected archaeological samples from Egypt that were dated in the

[573] Merrill, "Progress Report," *American Antiquity* (1948), 286.
[574] Brief histories of the development of radiocarbon are given in Frederick Johnson, ed. "Radiocarbon Dating," *American Antiquity*, Memoirs of the Society for American Archaeology 17, no. 1, part 2 (July 1951); and Willard F. Libby, *Radiocarbon Dating* (Chicago: University of Chicago Press, 1952). See also Paul Fejos, *The Wenner Gren Foundation for Anthropological Research: The First Ten Years 1941-1951 as The Viking Fund* (New York: The Viking Fund, 1951), 22-24. For a recent history of radiocarbon development written by archaeologist practitioners, see chapter 8 in R.E. Taylor and Ofer Bar-Yosef, *Radiocarbon Dating: An Archaeological Perspective*, 2nd ed. (Walnut Creek, CA: Left Coast Press, 2014), 263-295.
[575] See: Johnson to Rainey and Collier, December 10, 1948 (FJ 1:2, UCLA); Rainey to Fejos, January 27, 1949 (FJ 1:2, UCLA); Libby to Fejos, December 13, 1948 (FJ 1:1, UCLA); Johnson to Libby, January 28, 1949 (FJ 1:1, UCLA); Johnson to Fejos, January 3, 1949 (FJ 1:[A-G Carbon 14 1948-Aug. 1950], UCLA); Fejos to Johnson, January 11, 1949 (FJ 1:[A-G Carbon 14 1948-Aug. 1950], UCLA).

historical record to a precise dynasty, using them to calibrate the radiocarbon dates against known chronometric data.[576]

Following these successful tests, the group moved on to samples of unknown age but known provenance, which "could be associated with archaeological complexes having some meaning relative to sequences which had been developed," providing a rough plausibility check on the dates.[577]

[576] Frederick Johnson, ed. "Radiocarbon Dating," *American Antiquity*, Memoirs of the Society for American Archaeology 17, no. 1, part 2 (July 1951). Froelich Rainey asked the committee to focus its early efforts on dating well-known or otherwise controversial archaeological sites; Rainey to Johnson, May 11, 1949 (FJ 1:2, UCLA). Richard Foster Flint, a geologist based at Yale, also assisted the main committee members at various points during the project.

[577] Frederick Johnson, "Present Status of Carbon 14 Research," paper read at the Society for American Archaeology Annual Meeting, Norman, Oklahoma (May 20, 1950): 2. (FJ 2: [Committee on Carbon 14, Miscellaneous], UCLA)

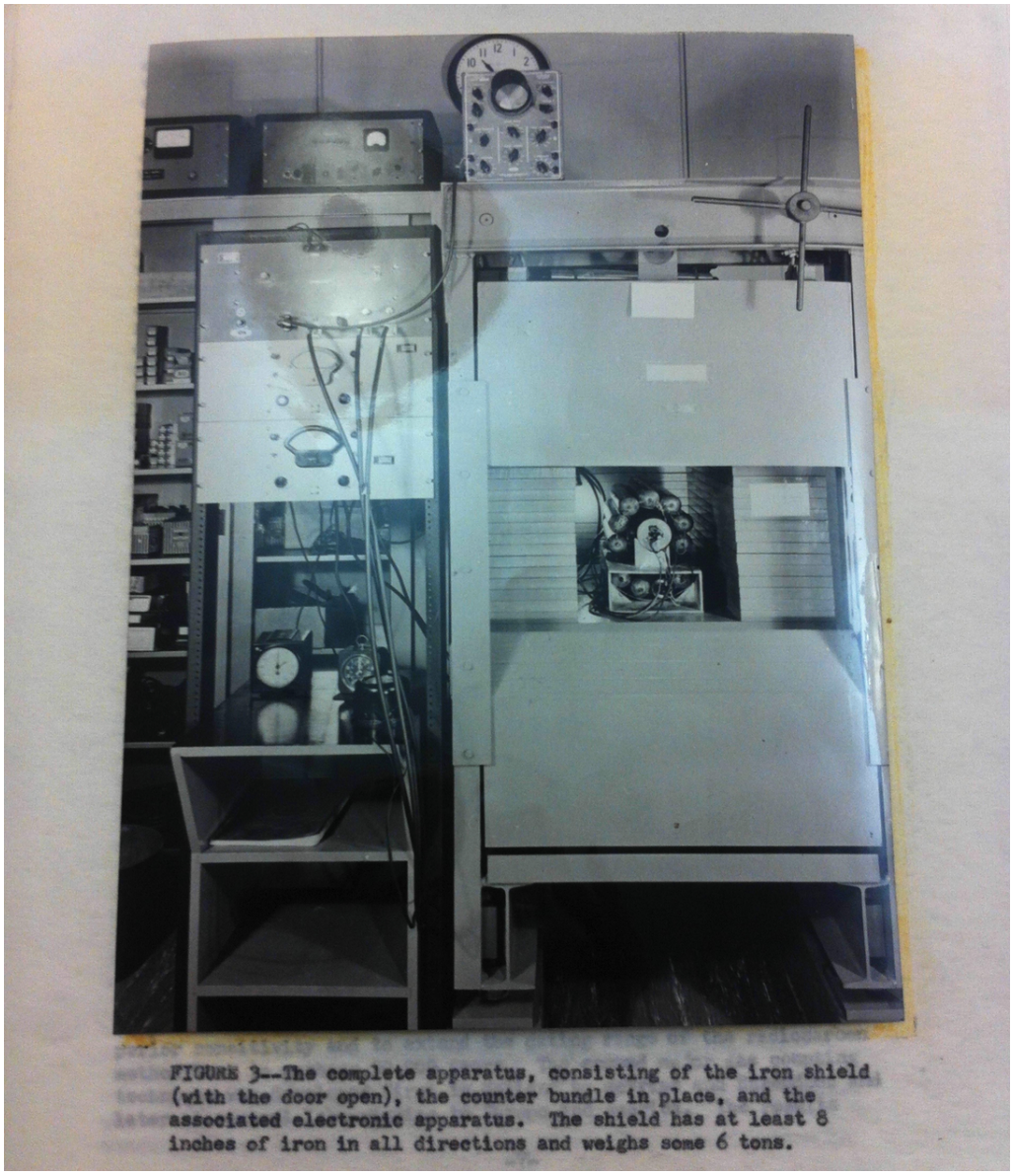


Figure 15 Radiocarbon counting apparatus, typescript draft of Willard F. Libby, "Radiocarbon Dating," *Endeavour* 13, no. 2 (January 1954). (W.F. Libby papers, box 15, UCLA Libraries.)

The next step in the Radiocarbon Committee's work was to conduct a worldwide assay of environmental radiocarbon, to establish that radiocarbon absorption was consistent at widely varying latitudes and elevations (the preferred option), or, barring that, to ascertain the corrections necessary to accurately compare the calculated dates for sample material that

originated in different parts of the world. In an October 1948 letter to Frederick Johnson, Libby set out a list of locations that were still unrepresented in his survey: "Northern Canada, New Zealand, modern Egypt, the Union of South Africa, Siberia, Japan or China, Iceland, the Philippines, Hawaii, Pitcairn Island or other islands in this group, and French West Africa at about 20˚N and 0˚W."[578] This collecting task fell largely to the archaeologist members of the Committee, who mobilized their professional network, relying on American academics who did regular work in particular parts of the world, who could use their own contacts to gather samples and funnel them back to the radiocarbon team. In the next year, after the initial worldwide assay was complete (and had confirmed that worldwide radiocarbon content was equal, regardless of locale), the committee used a similar point-man method to gather samples for testing from particular geographic regions.[579] Hallam Movius Jr., at Harvard, for example, was responsible for organizing the collection of samples from Scandinavia and Western Europe, while Robert Braidwood, at the University of Chicago, coordinated and shared his own specimens from Mesopotamia and the Middle East. However, projects in American archaeology dominated the list of target artifacts and sites at this stage of systematic dating work.[580]

Johnson was also concerned that the committee might be relying overmuch on exclusively archaeological samples, writing to Libby that they should attempt to "establish the program on as broad a basis as possible."[581] Samples of peat bogs were of high interest to the committee, but it was difficult to find bogs in the United States that had not already been drained. Ecologist Edward Deevey, a colleague of Richard Foster Flint's at Yale, wrote to a

[578] See Libby to Johnson, October 14, 1948. (FJ 1:1, UCLA).
[579] Johnson to Fejos, May 3, 1949. (FJ 1: [N1 A-G Carbon 14 1948-Aug. 1950], UCLA). The network was almost entirely male.
[580] See James B. Griffin to Johnson, May 21, 1949. (FJ 1: [N1 A-G Carbon 14 1948-Aug. 1950], UCLA).
[581] Johnson to Libby, April 8, 1949. (FJ 1:1, UCLA).

colleague in England to ask for samples of British peats, and Hallam Movius used contacts he had cultivated on the European continent to arrange correspondence and an exchange of samples between the Radiocarbon Committee and the National Museum of Denmark.[582] Gaining specific samples was sometimes challenging, but it was rarely impossible; someone on the Radiocarbon Dates Committee could usually find a willing collaborator who could either share material, or volunteer to contact someone else who could send a piece of wood or sample of peat to the United States for Libby's laboratory to analyze.

The radiocarbon dating project was only possible because of the collaboration between archaeologists from steady, long-established institutions with large collections of artifacts and long-standing collaborative networks of field researchers, on the one hand, and the new and rapidly expanding world of atomic chemistry, with its expanding research horizons, high-tech tools, and capacity to tap into deep wells of government funding on the other. Tensions emerged within the project as early as 1949, both between the Radiocarbon Dates Committee and the sample-submitting archaeologists, and among the members of the Dates Committee itself. Archaeologists were motivated to send the Committee material from ongoing excavations in part because they stood to directly benefit from learning how old a site or artifact was, in absolute rather than relative terms. This raised the question: who "owned" the chronological data that was being produced? In June 1949, Donald Collier wrote to Frederick Johnson:

> I favor the sending by Libby to collaborators of progress reports on the whole project, if the collaborators understand and agree that the data contained *are for information but not publication*. I think this device would be extremely useful in keeping the collaborators informed and increasing their understanding of the problems and difficulties involved…[583]

[582] Deevey to Harry Godwin, October 17, 1949. (FJ 1: [N1 A-G Carbon 14 1948-Aug. 1950], UCLA); Movius to Johnson, October 18, 1949. (FJ 1: [N2 L-P Carbon 14 1948-Aug. 1950], UCLA).
[583] Collier to Johnson, June 10, 1949 (FJ 1:2, UCLA).

Libby was mostly interested in establishing proof-of-concept; if a machine needed to be recalibrated, or unexpected contamination required a date to be revised a few hundred years in one direction or another, he was only concerned with identifying and correcting the problem.[584] Obviously, a few hundred years could make a tremendous difference to an archaeologist, especially one hurrying to get a description of a new site excavation into publication. In a speech to the Society for American Archaeology in May 1950, Johnson had to specify that any preliminary dates being reported should be understood as incidental data from a physics experiment performed by Libby and Arnold, and that archaeologists who submitted samples for testing should not treat as their personal intellectual property the age estimates they received in return.[585] However, even Johnson and the other archaeologists on the Radiocarbon Dates Committee began to be irritated with Libby's ignorance of (or disdain for) their disciplinary norms. Johnson wrote to Jesse Jennings, an archaeologist and the editor of *American Antiquity* in December 1950: "Libby is a physicist of top rank…However, he has no idea, even now, of the broader implications of what he has done or is doing. He cannot yet appreciate the importance or interest of his dates beyond the tables he prepares in the narrow confines of his laboratory."[586] A few months later, Johnson began another letter to Jennings with "Libby always does things in the damndest fashion."[587] Libby had begun writing his own book on the radiocarbon process, targeted to an audience of nuclear physicists and chemists, with a heavy focus on sample preparation and apparatus construction. Now he wanted to include reprints of material Johnson

[584] See memorandum from Richard Foster Flint, May 25, 1950 (FJ 1:2, UCLA); Johnson to Libby, May 31, 1950, and Libby to Johnson, June 7, 1950. (FJ 1:1, UCLA).
[585] Frederick Johnson, "Present Status of Carbon 14 Research," paper read at the Society for American Archaeology Annual Meeting, Norman, Oklahoma (May 20, 1950): 3. (FJ 2: [Committee on Carbon 14, Miscellaneous], UCLA).
[586] Johnson to Jesse Jennings, December 15, 1950 (FJ 1:3, UCLA).
[587] Johnson to Jennings, April 18, 1951. (FJ 1:3, UCLA).

and Jennings had produced for *American Antiquity*, to add a little archaeological color and interest for his audience. The problem wasn't really one of competition – Johnson recognized that the audience for a monograph on nuclear chemistry was not really the same as the devoted readership of *American Antiquity* – but he was irritated by Libby's high-handed attitude. "On second thought," he added to Jennings, "it might be an idea to 'force' the nuclear brethren to get a Memoir if they had to have one."[588]

After the first list of radiocarbon dates was published in 1951, along with reports from Libby, Johnson, and other committee members, the Radiocarbon Dates Committee was disbanded. [589] The radiocarbon dating concept had proven so successful that it was clear that the Dating Committee would never be able to keep up with demand unless Libby and his lab were willing to halt their research careers entirely to run dating samples for the rest of their lives. Instead, over the course of the 1950s, radiocarbon dating began to emerge as a dedicated sub-field of its own, complete with regular conferences (one in Andover, MA and another in Copenhagen within weeks of each other in fall 1954), dedicated journals (*Radiocarbon*, published from 1959 on), and its own set of technical and theoretical problems. Although developed as a joint project between nuclear physics and chemistry, on one side, and archaeology on the other, both fields found themselves increasingly sidelined as radiocarbon work became more specialized. When planning a joint meeting of European and American radiocarbon experts in 1955, James Arnold (now a physics professor at Princeton) mused about the difficulties of meaningfully discussing new work on carbon-14's half-life in a room of non-physicists, and pointed out that more and more chemists were transferring their C-14 research

[588] Johnson to Jennings, April 18, 1951. (FJ 1:3, UCLA). The "Memoir" is the *Memoirs of the Society for American Archaeology*, published as a supplement to *American Antiquity*.
[589] Johnson to Libby, November 30, 1951. (FJ 2: [Carbon 14 Arnold & Libby Sept. 1950], UCLA).

interests from archaeology to geochemistry and oceanography.[590] Danish radiocarbon researcher Hilde Levi similarly remarked that the physicists, chemists, archaeologists, and geologists who would make up such a meeting would have some topics in common, but equally might prefer to discuss technical challenges exclusively with their disciplinary co-confessants.[591]

In 1959, *Radiocarbon* published a complete list of dating laboratories around the world: sixteen in Europe, fourteen in the United States, three in Canada, and one each in Australia, New Zealand, and Japan.[592] Of the sixteen European labs, fifteen were in NATO or non-aligned countries; the remaining laboratory was in Poland. Six more labs, including one in Moscow, opened in 1960.[593] Radiocarbon was becoming more international, but still overwhelmingly confined to North America and Western Europe, continuing the pattern that had been present from the first data-gathering exercises of the Radiocarbon Dates Committee. The worldwide assay project, for example, was successful in terms of gathering sample material from all over the globe, but specimens from the Americas in general, and particularly the United States dominated the first list of dates published in 1951.[594] Most of the dated samples came from North America, with Central America and Europe in second place. Next in rank order were samples from Mesopotamia and Western Asia, which included Egypt, and most of the materials came from American museums. The 1951 dates list had three items from Australia, three from East Asia, and one item from sub-Saharan Africa: carbonized wood found on top of a stone blade

[590] James Arnold to Johnson, October 3, 1955. (FJ 4: [Agenda: Physics, etc.], UCLA).
[591] Hilde Levi to Johnson, November 3, 1954. (FJ 2: [Radiocarbon Cambridge Conference], UCLA).
[592] "List of Laboratories," Richard Foster Flint and Edward S. Deevey, Jr., eds., *American Journal of Science Radiocarbon Supplement*, (New Haven: Sterling Tower, Yale University, 1959), 215-218.
[593] Appendix II, "Radiocarbon laboratories known to be in operation during 1960," in Lynn and Gray Poole, *Carbon-14 and Other Science Methods that Date the Past* (New York: Whittlesey House, 1961), 154-156.
[594] Frederick Johnson, "Radiocarbon Dating: A Report on the Program to Aid in the Development of a Method of Dating," in Jesse Jennings, ed., *Memoirs of the Society for American Archaeology* 8 (1951), 5-19.

from a late Pleistocene deposit in Mufo, Angola.[595] The samples all made their way to Chicago through networks created by American researchers, and paid for by American institutions and research grants, all undergirded by the emergent Cold War military-industrial complex, and Americans continued to dominate international radiocarbon work for several years.

In 1954, the organizers of a radiocarbon conference in Copenhagen deliberately didn't invite American researchers, because they wanted to promote contacts between European research laboratories rather than routing all research collaboration through the better-funded labs in the United States.[596] According to Levi:

> With few exceptions, the European labs are in the very beginning of their work; it therefore seemed to me that American workers, if present, necessarily would dominate, both because of their much advanced techniques and the extensive research projects they have under way. They would cause the European beginner to remain rather silent, and while he would hear how much better others are doing, he would not get his own troubles discussed.[597]

Still, when an international congress between American and European researchers was proposed, Levi pushed for the conference to be held in the United States, since then European scientists could travel around to multiple laboratories in the US, making valuable contacts and learning new techniques, so long as the necessity of funding trans-Atlantic travel could be met.[598] If the conference absolutely had to be held in Europe, then England was the only possible location. This turned out to be the best option, and Cambridge University played host to an international conference on radiocarbon dating for researchers from both sides of the Atlantic in July 1955.[599]

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[595] Johnson, "Radiocarbon Dating: A Report," 16-19. By way of comparison, the Radiocarbon Dates Committee dated more items from Utah (2) than from sub-Saharan Africa (1).
[596] Hilde Levi to Johnson, November 3, 1954. (FJ 2: [Radiocarbon Cambridge Conference], UCLA).
[597] Hilde Levi to Johnson, November 3, 1954. (FJ 2: [Radiocarbon Cambridge Conference], UCLA).
[598] Hilde Levi to Johnson, December 2, 1954. (FJ 2: [Radiocarbon Cambridge Conference], UCLA).
[599] Frederic Johnson, annotated program, Cambridge Conference on Radio-Carbon Dating, July 25-30, 1955. (FJ 2: [Radiocarbon Cambridge Conference], UCLA).

The conference was, in fact, international, but the nations in question were the UK, the US, and a small smattering of European countries (going by the list of speakers). The language of the conference appears to have been English; no papers are listed in other languages, and in any case the large Anglophone majority would probably have dominated in both formal and informal exchanges. Radiocarbon promised to unlock the history of human cultural activity around the world, but for the first years of radiocarbon dating the research priorities, data gathering, sample testing, and publication timelines were all set by American researchers working at institutions in the United States.[600]

Researchers in the United States were also the first to notice a small, but growing problem related to doing radiocarbon dating in an increasingly nuclear world. At the University of Pennsylvania, anthropologist Carleton Coon described how the radiocarbon laboratory had to halt operations intermittently during the summer and fall of 1952, taking a week or two off before starting their measurements all over again. The source of their problem was "free C-14 in the atmosphere, blown over from Nevada." Coon continued, "If many more atomic bombs are set off, this method of dating may itself become outdated."[601] Even on a purely local level, the expanding medical applications of radioactivity increased the chances of cross-contamination

[600] This US-dominated trans-Atlantic internationalism fits in well with the dynamics described in John Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe* (Cambridge: The MIT Press, 2006).

[601] Carleton Coon, *The Story of Man: From the First Human to Primitive Culture and Beyond* (New York: Knopf, 1954), 154. Assuming Coon was right about Nevada, the source of the radiocarbon contamination was probably the Operation Tumbler-Snapper series, conducted at the Nevada Proving Ground from April-June 1952. The disruptions in the fall probably came from the Operation Ivy test series of multi-megaton thermonuclear hydrogen bombs at Eniwetok Atoll in the Marshall Islands, which absolutely would have increased atmospheric radiocarbon levels. (The Nevada test series may have just thrown off instruments with more ordinary fission debris.) Coon was probably not the most informed observer of Penn's radiocarbon program, since he was an anthropologist who studied living populations and mostly wrote on race theories.

and skewed dating results; Coon described how radioactive smoke from the university hospital's incinerator could set off a laboratory Geiger counter.

As the number of international laboratories increased, it also became clear the problem was not confined to the US. In the first published list of dates from the British Museum, released in 1959, the authors noted that the list was shorter than intended, since significant fluctuations in background radiation rates in the spring and autumn of 1958 had disrupted measurements and calibration tests. Later, in 1963, the British Museum research group had to modify its equipment because high concentrations of tritium—produced by nuclear weapons tests—had been detected in the local water supplies, and affected the gas synthesis procedures used in the proportional counting mechanism.[602] Radiocarbon contamination was a global-scale phenomenon.

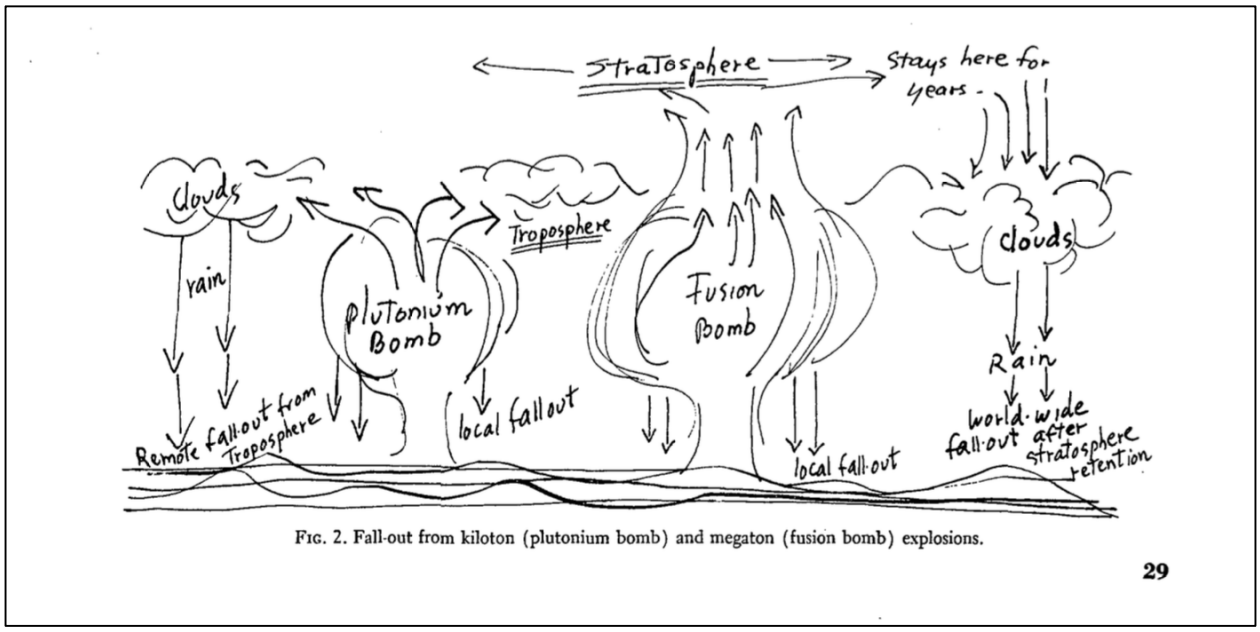


Figure 16 Sketch from article by Willard F. Libby, "Distribution and Effects of Fall-out," *Bulletin of Atomic Scientists* 14, no. 1 (1958), 29.

[602] H. Barker and C.J. Mackey, "British Museum Natural Radiocarbon Measurements V," *Radiocarbon* 10 (1968), 1-7.

Detonating a nuclear bomb produces radioactive debris via two pathways. First, and obviously, explosion of the fissionable bomb fuel produces radioactive fission products, which then fall out of the sky and enter the larger environment. As atmospheric tests of megaton bombs continued in the 1950s, however, AEC researchers also realized that detonating a thermonuclear bomb also released large quantities of free neutrons, which then collided with atmospheric nitrogen to produce radioactive carbon-14 isotopes in the upper atmosphere – not that dissimilar from the process the AEC used to make carbon-14 in their reactors at Oak Ridge. Before atomic bombs, atmospheric nitrogen turned into carbon-14 mainly because of cosmic ray bombardment of the upper atmosphere. Rates of cosmic ray activity had remained mostly constant for several thousand years by the point that radiocarbon testing was developed, which was crucial to the workability of the dating method. The increasingly large bomb blasts of the 1950s—like the Castle Bravo test in 1954, which produced 15 megatons of yield, roughly 1000-times the power of the first atomic bomb dropped on Hiroshima in 1945—were experienced in the upper atmosphere like a really big cosmic ray event. [603] The introduction of bomb-produced neutrons dramatically increased the amount of carbon-14 available for uptake in living organisms. As the radiocarbon proof-of-concept research had shown a decade earlier, carbon-14 uptake in living plants and animals was highly efficient; a large increase in the available reservoir would mean a large increase in radiation exposure for flora, fauna, and human beings. As a result, a newspaper reported in 1963, "today's animals and plants are absorbing far more radiocarbon than they

[603] The Castle Bravo test in 1954, for instance, had a yield of 15 megatons, roughly 1000-times the power of the original atomic bomb dropped on Hiroshima in 1945. See Alex Wellerstein, "Castle Bravo at 60," *Restricted Data: The Nuclear Secrecy Blog*. Published online February 28th, 2014. http://blog.nuclearsecrecy.com/2014/02/28/castle-bravo-at-60/; and Alex Wellerstein, "The Hiroshima-Equivalent: A Modest Proposal," *Restricted Data: The Nuclear Secrecy Blog*. Published online June 7th 2013. http://blog.nuclearsecrecy.com/2013/06/07/a-modest-proposal/

normally would. This abnormal absorption rate is bound to affect radiocarbon tests of the distant future."[604]

More immediately, though, scientists, governments, and the public wanted to know if elevated carbon-14 was a problem for the public, not just for anthropologists and archaeologists with radiocarbon labs. As both a radiocarbon man and, since 1954, a member of the US Atomic Energy Commission, Libby was dispatched to address the issue. In an open letter to the *Bulletin of the Atomic Scientists* in June 1957, he described nuclear weapons testing as minimally risky, compared to other sources of risk in everyday life, and as a worthy gamble when balanced against the "far greater risk – to freedom-loving people everywhere in the world – of not maintaining our defenses against the totalitarian forces at large in the world," at least until total disarmament could be achieved.[605] In a 1958 address to the D.C. chapter of the Federation of American Scientists, Libby stated that the bomb tests to date had produced enough carbon-14 to "increase the amount naturally present in all living matter by one-third of one percent," which was nothing to be concerned about; humans experienced the same increase in radiation exposure when they went up a few inches in altitude.[606] Oceanographic research had shown that large volumes of carbon-14 ended up in storage in the deep ocean waters. It would take about five hundred years for the ocean-land equilibrium to re-equalize, with environmental radiocarbon amounts remaining about three percent higher than historic baselines, equivalent to an elevation gain of about three feet – and this was only after an initial period of ten or twenty years had

[604] "A skeleton, a theory, a problem," *Richmond News Leader*, Friday, November 22, 1963. (WFL 44: [November 21, 1963, Sigma Xi Lecture, Medical College of Virginia, "Radioactive Dating."], UCLA).
[605] Willard Libby, "A Letter to Dr. Schweitzer," *Bulletin of the Atomic Scientists* 13, no. 6 (June 1, 1957), 206.
[606] "Statement by Dr. W.F. Libby, commissioner United States Atomic Energy Commission, for delivery before the Washington chapter, Federation of American Scientists. Washington D.C. -- May 1, 1958." (WFL, 13 (Speeches, AEC): ["Carbon-14 From Bomb Tests," for delivery before the Washington Chapter, Federation of American Scientists, Washington D.C. May 1, 1958], UCLA).

passed, when environmental radiocarbon created by the bomb tests would be a full twenty percent higher than baseline.[607]

However, as a 1958 paper by John Totter, M.R. Zelle, and H. Hollister noted, genetic and somatic effects of radiation increased linearly with dosage, so any increase in total radiation, however minimal, would necessarily lead to increased rates of cancers, stillbirths, genetic anomalies, and other negative health outcomes in the global human population.[608] In 1958, chemist and anti-nuclear activist Linus Pauling also published a paper in Science describing the genetic and somatic effects of carbon-14, and argued on the basis of his calculations that "the genetic damage…may be greater for carbon-14 than for the fission products usually classed as world-wide fallout, and that the somatic effects may be on the same order of magnitude."[609] Pauling ultimately estimated the genetic and somatic effects of carbon-14 fallout as being about 17 times greater than those associated with conventional fission products, although he admitted his calculations had a high degree of uncertainty. Relative to the other fission products, the long half-life of carbon-14 magnified its biological effects. Strontium-90 and cesium-137, for example, had half-lives of about 30 years; carbon-14, with a half-life of 5730 years, would degrade 191 times slower. The long half-life also magnified scientists' concerns: while it was concerning enough that strontium-90 might linger in the teeth of the present population of young children, bomb-produced carbon-14 would contaminate the entire biosphere, and linger for

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[607] Libby's emphasis on the sequestering of C-14 in the deep ocean echoes thinking in the same period about disposing of nuclear waste in the oceans, which was much less effective than scientists and policymakers had hoped. See Jacob Darwin Hamblin, *Poison in the Well: Radioactive Wastes in the Oceans at the Dawn of the Nuclear Age* (New Brunswick: Rutgers University Press, 2008).
[608] John R. Totter, M.R. Zelle and H. Hollister, "Hazard to Man of Carbon-14," *Science* 128, new series, no. 3337 (Dec. 12, 1958), 1490-1495. Zelle and Hollister were both staff in the AEC's Division of Biology and Medicine, where Totter had also worked before taking a job at the University of Montevideo, Uruguay. (See footnote, 1491).
[609] Linus Pauling, "Genetic and Somatic Effects of Carbon-14," *Science* 128, new series no. 3333 (Nov. 14, 1958), 1183-1186.

generations. The characteristics that made carbon-14 so useful for understanding human history was the same characteristic that made it a potential, formidable poison.

The lists of dates calculated around the world and published in *Radiocarbon* and other journals continued to grow. In 1960, Willard Libby was the sole recipient of the Nobel Prize in chemistry "for his method to use carbon-14 for age determination in archaeology, geology, geophysics, and other branches of science." At the presentation ceremony, the chairman of the Nobel committee emphasized the ways radiocarbon had illuminated "the prehistory of mankind," including assigning dates to a 15,000-year old sample of campfire charcoal found in France, and a 25,000-year old sample from a hearth in Iraq.[610] In this context, radiocarbon was cast as a peaceful, humane example of nuclear research, where atoms and isotopes were put to work illuminating the human past, instead of shadowing the human future.[611]

In a 1961 book for children, *Carbon-14 and Other Science Methods that Date the Past*, science educators and popularizers Lynn and Grey Poole described the value of radiocarbon in terms of how these tools added to the world's understanding of the human story.[612] While the Pooles touched on many applications, including geochronology and petroleum prospecting, the central theme of the book was that scientific dating was important and interesting because answering the question "How old is it?" would help scientists, and therefore the rest of us, understand when and how the earliest humans had lived.[613]

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[610] A. Westgren (Chairman of the Nobel Committee for Chemistry, Royal Swedish Academy of Sciences), banquet speech for W.F. Libby, December 10, 1960. *Nobelprize.org* http://www.nobelprize.org/nobel_prizes/chemistr y/laureates/1960/press.html

[611] On the peaceful deployments of nuclear energy, see Creager, *Life Atomic*; Krige, *American Hegemony and the Postwar Reconstruction of Science in Europe*; and Paul Boyer, *By the Bomb's Early Light: American Thought and Culture at the Dawn of the Atomic Age* (New York: Pantheon, 1985).

[612] Lynn and Gray Poole, *Carbon-14 and Other Science Methods that Date the Past* (New York: Whittlesey House, 1961).

[613] Poole and Poole, 10.

"It is known," the text began, "that primitive man roamed the earth in search of food hundreds of thousands of years ago."

> He very slowly became a more civilized being. He developed his skill in the arts and in agriculture. Men began to group themselves into communities, and then small communities joined together as *nations*. People within each of the many nations became curious about their own limited world. They wanted to know more about other nations. Civilizations rose and fell as the human being progressed from brawling brute to modern man.[614]

Radiocarbon had made this progression visible to modern observers, within the temporal boundaries set by the limits of the half-life and the sensitivity of the measuring mechanism. It also allowed natural events to be placed on an absolute timeline. Dating wood from trees that had been trapped underneath the advancing ice of the fourth ice age, for example, now assigned a hard date to one of the major benchmarks for relative dating.[615] (As a result, many dates for climate shifts, cultural products, or famous extinct mammal fossil finds now also had to be adjusted.)

[614] Poole and Poole, 10.
[615] See, for example, discussion in Lynn and Gray Poole, *Carbon-14 and Other Science Methods that Date the Past* (New York: Whittlesey House, 1961): "Few people today will argue the fact that establishment of the fourth Ice Age is one of the more important contributions of carbon-14 dating, one of the most far-reaching advancements in modern science. Dating the fourth Ice Age was a major milestone in re-evaluating the time-table of nature." (Poole and Poole, 54.)



Figure 17 The promise of radiocarbon dating. Illustration in Lynn and Gray Poole, *Carbon-14 and Other Science Methods that Date the Past* (New York: Whittlesey House, 1961).

The effort to systematize and globally correlate dates in the deep past had been ongoing since at least the nineteenth century; now, for the first time, radiocarbon dating allowed concrete, verifiable numbers to be attached to the benchmark events. It also showed that humans had been

building fires, carving tools, and creating art for a much longer span of time than many observers had expected. Radiocarbon was additionally useful for dating recent material, and was deployed to identify fake and frauds in museum antiquities collections. However, the most stunning and attention-grabbing discoveries were those that located the emergence of human culture in the far-distant past—long in advance of the development of modern concepts of ethnos or nation.

In Search of Fossil Clocks

When the Radiocarbon Committee was in the middle of collecting samples from around the world to build its reference list, Louis Leakey wrote to Libby and Johnson about whether they might be able to date hominin material he had excavated in East Africa.[616] In the same vein, American archaeologist Hallam Movius also wrote to the committee, offering charcoal from Zhoukoutien, China, taken from prehistoric hearths associated with Peking Man.[617] In both cases, the Radiocarbon Committee decided that the samples were almost certainly too old to be dated with the current sensitivity of the radiocarbon detector; furthermore, the test would require destroying most of the fossil specimens and the charcoal fragments in order to get enough physical material. Culture could be dated, but hominin fossils remained an open question, especially those that had been found in deeper strata that dated back to the early Pleistocene or

[616] East African material: Libby to Johnson, August 15, 1949 (FJ 1:1, UCLA); Johnson to Libby, September 1, 1949 (FJ 1:1, UCLA); Libby to LSB Leakey, September 14, 1949 (FJ 1: [N2 L-P Carbon 14 1948-Aug. 1950], UCLA); Movius to Johnson, October 18, 1949 (FJ 1: [N2 L-P Carbon 14 1948-Aug. 1950], UCLA). I was not able to locate the original letter from LSB Leakey to Libby in either the Johnson or Libby papers (also held at UCLA). Leakey and Libby either maintained or re-established contact in the 1960s, when Leakey was spending a few weeks each year in southern California, and Libby nominated Leakey for the 1967 Family of Man Award of Excellence. Libby to Wheelock H. Bingham, February 15, 1967. (Willard F. Libby papers (hence WFL), 113: [Miscellaneous], UCLA Special Collections).
[617] Zhoukoutien material: Johnson to Libby, October 6, 1950 (FJ 2: [Carbon 14 Arnold & Libby Sept. 1950], UCLA); Hallam Movius Jr. to Libby, October 13, 1950 (FJ 2: [Carbon 14 Arnold & Libby Sept. 1950], UCLA).

late Pliocene. In the 1950s, however, other methods of chemical and physical dating began to emerge from a similar techno-political postwar landscape.

While Willard Libby was working on atomic chemistry for the Manhattan Project, British geologist Kenneth Oakley spent his war years with the British Geological Survey, where he was responsible for overseeing research on two main topics: tracking the distribution of phosphate deposits around Britain, which could be tapped for domestic production of chemical fertilizers, and studying the effect of fluorine on dental health.[618] (Since the Geological Survey shared a building with the Natural History Museum in London, he was also on duty as a night-time fire warden, responsible for patrolling the museum during air raids.) It was known that fluorine was readily absorbed by bone as early as the mid-nineteenth century, and both British geologist James Middleton and French chemist Adolphe Carnot had explored the possibilities that fluorine absorption could be used to approximately date fossils.[619] Both Middleton and Carnot realized, however, that fluorine was not a particularly useful basis for chemical dating: the rate of absorption would change depending on local environmental conditions, while the amount of fluorine available in local groundwater could also vary enormously from site to site. The technique faded from prominence by the beginning of the twentieth century.

In 1943, Oakley returned to the idea of estimating the relative age of fossils by measuring the relative amount of fluorine fixation—a research question he reached by triangulating between his pre-war scientific interests and his wartime surveying projects—although he had no

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[618] For an overview of the development of fluorine dating and Oakley's place within it, see Matthew R. Goodrum and Cora Olson, "The Quest for an Absolute Chronology in Human Prehistory: Anthropologists, Chemists and the Fluorine Dating Method in Paleoanthropology," *British Journal for the History of Science* 42, no. 1 (March 2009), 95-114. Properly speaking, it was the presence of fluoride ions in the calcium matrix that the dating test was measuring, since elemental fluorine is a diatomic, super toxic gas under normal atmospheric conditions.

[619] See discussion in Goodrum and Olson, "Quest for an Absolute Chronology," 99-106. Marie-Adolphe Carnot was the nephew of the pioneering thermodynamics theorist Sadi Carnot.

opportunities to put any of these ideas into action. There was no method known for accurately determining the fluorine content of bones to the degree of specificity required, however, and the Natural History Museum lacked the sophisticated analytical apparatus that would be necessary to conduct even preliminary tests.[620]

After the war, however, and with the advantage of having worked closely on problems relating to the chemical interactions of naturally-occurring phosphates and fluorine on a scale ranging from individual teeth to the British countryside, Oakley was ready to take his investigations a few steps further. In 1947, he conducted some preliminary tests measuring the fluorine content of fossilized bone at a forensics laboratory belonging to the British Home Office. The outcome was that fluorine content could be measured, but only in very large sample sizes. By 1948, working together with the office of the Government Chemist, Oakley had refined his measurement techniques, and developed methods for extracting and measuring the fluorine content of much smaller samples of bone. For one of his first dating targets, Oakley selected samples from one of the Natural History Museum's most controversial specimens—the infamous Piltdown Man.[621]

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[620] Report on the History of Reinvestigation of Piltdown Relics, prepared by the Keeper of Geology for the Trustees, November 30, 1953. (DF 116/43 History of reinvestigation Piltdown relics + press reports.)

[621] See Report on the History of Reinvestigation of Piltdown Relics, prepared by the Keeper of Geology for the Trustees, November 30, 1953. (DF 116/43 History of reinvestigation Piltdown relics + press reports); and Kenneth P. Oakley, "Results of Applying the Fluorine Test to the Piltdown Skull," B.A. Section H., September 5, 1949. (DF 116/53 Keeper of Paleontology's Piltdown File 1949-1980.) This was also not the only test that was deployed against the Piltdown mystery in the immediate postwar years; Wilfrid Le Gros Clark wrote to Clive Forster Cooper, the director of the Natural History Museum, in 1946 to inquire about borrowing specimens (including some pieces of Piltdown) to embark on some crystallographic studies of fossil age. See Le Gros Clark to Forster Cooper, August 12, 1946. (DF 116/36, NHM.) Le Gros Clark and Oakley were also in touch directly about the exciting possibilities of a more refined fluorine detection test; see Oakley to Le Gros Clark, July 23, 1948. (DF 116/36, NHM). In the same letter, Oakley also proposed a dinner for all the "Pan-African Congressites" who happened to be in London during August, an invitation that Le Gros Clark accepted with pleasure.

Piltdown Man had been a source of both stirring pride and profound embarrassment to the British paleontological and anatomical community since its discovery by lawyer and amateur archaeologist Charles Dawson in a gravel pit near Piltdown, in Sussex, between 1911 and 1913.[622] The fossil assemblage consisted of a skullcap with the same cubic capacity as that of a modern *Homo sapiens* and a mandible that looked like it belonged to an orangutan or chimpanzee—which was bizarre, since scientists had expected that brain power was the final human-like characteristic to evolve, not the first—and had been found with a collection of fossilized animal bones, which themselves seemed to come from two distinct periods in the early and late Pleistocene.[623] If the anatomical features could be explained, however, then the second question remained: how old was Piltdown Man?[624] Dawson, together with Arthur Smith Woodward, of the Natural History Museum in London, suggested that the specimens were

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[622] The Natural History Museum in London holds archival collections on both the discovery and debunking of Piltdown Man, as well as the papers documenting the many attempts to solve the mystery in the following decades. The Piltdown story has been investigated from many different angles, and has generated a substantial popular literature on the hoax. Two useful entry points into the literature are Frank Spencer's *Piltdown: A Scientific Forgery* (New York: Oxford University Press, 1990) and William T. Stearn's *The Natural History Museum at South Kensington*, revised ed. (London: The Natural History Museum, 2001). See also the discussion in Augustine Brannigan, *The Social Basis of Scientific Discoveries* (New York: Cambridge University Press, 1981). The scientific papers announcing the discovery of the Piltdown fossils were read December 18th, 1912, and published in the March 1913 number of the *Quarterly Journal of the Geological Society of London*. See Charles Dawson and Arthur Smith Woodward, with appendix by Grafton Elliot Smith, "On the Discovery of a Palaeolithic Human Skull and Mandible in a Flint-Bearing Gravel Overlying the Wealden (Hastings Beds) at Piltdown, Fletching (Sussex)," *Quarterly Journal of the Geological Society of London* 69 (March 1913), 117-151.

[623] Kenneth P. Oakley, "Results of Applying the Fluorine Test to the Piltdown Skull," B.A. Section H., September 5, 1949. (DF 116/53, NHM.)

[624] This was literally the second question asked in the discussion period at the Geological Society meeting, by the zoologist Sir Ray Lankester. See Elliot Smith, "On the Discovery," 147. Furthermore, although Smith Woodward and Elliot Smith were satisfied with their anatomical explanations, not all researchers were. In "Missing Links," written by American paleoanthropologist and Piltdown skeptic Gerrit S. Miller, the French paleoanthropological community had reached the consensus that Piltdown Man was an ape jawbone in the same hole as a human cranium; certain scholars in Sweden, Germany, and Italy agreed. American opinion was divided between supporters of the original Woodwardian view and others like physical anthropologist Ales Hrdlička suggesting the mandible and skull were each representative of different weird human types. See "Missing Links," Miller, *Annual Report of the Smithsonian Institution 1928*. [NHM, K.P. Oakley papers, Mss OAK Piltdown 3.2.]

contemporaneous with either of two groups of fossil mammals found at the same site, one of which was estimated as belonging to the early Pleistocene and the other to the late Pleistocene. Even if Piltdown Man was contemporaneous only with the late Pleistocene fauna found in the same site, it would still be significantly older than most European Neanderthal specimens, and suggesting that anatomically modern human brains had evolved in Britain first. For many reasons, this was a controversial claim, but the outbreak of World War I cut short the dispute. Dawson, the original discoverer, died in 1916, and the fossil was held in suspense as a possible human ancestor while scientists tried to puzzle out how its distinctive features could exist in a single creature.

In their first test, Oakley and C. Randall Hoskins (a collaborator from the Department of the Government Chemist) determined that the fossilized elephant tooth and other fauna most likely came from the early Pleistocene period, since they showed a very high fluorine content. In contrast, the other Piltdown fauna that were believed to be from the late Pleistocene (prehistoric beaver and red deer) showed "a very low fluorine content" and the Piltdown remains "extremely little fluorine content."[625] The sensitivity of the test was simply not good enough to tell whether or not the difference between "very low" and "extremely low" was significant, and Oakley and Hoskins concluded first that the cranial bones and the mandible were of the same age, and second that they probably also originated in the late Pleistocene.[626]

However, while drilling into the specimens for samples, Oakley and his colleagues discovered that the outside surface of the mandible and molars had been stained with a chemical residue; the aged, fossilized appearance gave way to bright new bone and dentine just below the

[625] Oakley, "Results of Applying the Fluorine Test," 2.
[626] See Oakley, "Results of Applying the Fluorine Test," and Kenneth P. Oakley and C. Randall Hoskins, "New Evidence on the Antiquity of Piltdown Man," *Nature* 165, no. 4193 (March 11, 1950), 379-382.

surface. In 1953, after a thorough investigation, Oakley, together with J.S. Weiner and Wilfrid Le Gros Clark, announced that the mandible and teeth had been faked and deliberately introduced into the Piltdown site.[627]

It was not just that the chemical staining was suspicious—with more refined fluorine measurement techniques, it was possible for Oakley, Weiner, and Le Gros Clark to establish that the fluorine absorption of the mandible and two of the Piltdown teeth were not only inconsistent with the levels expected for a lower Pleistocene date, but instead indicated the bones were from the modern human period.[628] "From the evidence we have obtained," wrote the authors,

> It is now clear that the distinguished paleontologists and archaeologists who took part in the excavations at Piltdown were the victims of a most elaborate and carefully prepared hoax. Let it be said, however, in exoneration…that the problem was not capable of solution on the available evidence, that the faking of the mandible and the canine is so extraordinarily skillful, and the perpetration of the hoax appears to have been so entirely unscrupulous and inexplicable, as to find no parallel in the history of paleontological discovery.[629]

At first the cranium was believed to be a legitimate human fossil of undetermined antiquity, until Oakley and Weiner re-examined it in 1955 and found that it too had been stained to appear older, using the same chemical mixture as the other fragments.[630] Furthermore, x-ray and collagen

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[627] J.S. Weiner, K.P. Oakley, and W.E. Le Gros Clark, "The Solution of the Piltdown Problem," *Bulletin of the British Museum (Natural History) Geology* 2, no. 3 (London, 1953), 139-146. [NHM DF 512/7/1]. See also press release description in "Piltdown Man, Note 1," undated 1953 (DF 116/53, NHM) and Gavin de Beer, "The Piltdown Skull," British Museum (Natural History) Press Notice December 1, 1953 (DF 116/43, NHM). Shortly after the news broke in the press, Joseph Weiner, Kenneth Oakley, and Margaret Oakley all drove out to visit Arthur Keith at his cottage in Downe, Kent (the same village where Charles Darwin had made his home) to break the news in person; see letter from Oakley to Keith, November 14, 1953, and Weiner and Oakley, "A Visit to Sir Arthur Keith, November 21, 1953," both in DF 116/25, NHM.

[628] Weiner, Oakley, and Le Gros Clark, "Solution of the Piltdown Problem," 143.

[629] Weiner, Oakley, and Le Gros Clark, "Solution of the Piltdown Problem," 145.

[630] Gavin de Beer, press notice "The Full Extent of the Piltdown Hoax," June 29, 1954 (DF 116/43, NHM), and J.S. Weiner, W.E. Le Gros Clark, K.P. Oakley, G.F. Claringbull & M.H. Hey, F.H. Edmunds, S.H.U. Bowie & C.F. Davidson, C.F.M. Fryd, A.D. Baynes-Cope, A.E.A. Werner & R.J. Plesters, "Further Contributions to the Solution of the Piltdown Problem," *Bulletin of the British Museum (Natural History) Geology* 2, no. 6 (London: 1955), 225-287 (DF 512/7/2, NHM).

analysis had established that the mandible definitely belonged to a modern ape—it had probably come from a juvenile orangutan.[631] "Piltdown Man" was neither a Pleistocene ape-man nor was it truly from Piltdown—juvenile orangutans not being common in the ordinary fauna of modern Sussex. The entire fossil construct had to be a carefully constructed, deliberately planted fake.[632]

Disproving Piltdown was important on two fronts. First, and most importantly, vacating Piltdown Man as a legitimate human ancestor cleared up a significant question about the processes and pathways of human evolution. The large, human-like brain and ape-like jaw of Piltdown Man was precisely the opposite of the anatomical features that had been observed in the South African australopithecines, for one, and ran counter to the evolutionary expectation that the large brain was the last "human-like" quality to evolve in hominin populations, rather than the first. Eliminating Piltdown from consideration made understanding human evolution much easier, since its strange features had long been:

> …a most awkward and perplexing element in the fossil record of the Hominidae, being entirely out of conformity with both its strange mixture of morphological characters and its time sequence with all the paleontological evidence of human evolution available from other parts of the world.[633]

Second, while the discovery initially hinged on the discovery that the fossils were covered with chemical staining that had no natural or innocent explanation, establishing Piltdown as a fake also raised the profile of fluorine dating, and chemical and radiometric dating

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[631] Weiner et al., "Further Contributions," 228.

[632] The identity of the Piltdown hoaxer remained the longest-running paleontological whodunits of the twentieth century. Following further analysis of the skull and mandible in 2016, a research group in the UK determined that a single individual had been responsible for faking the specimens, and identified Charles Dawson as the most plausible candidate, given the work required. See Isabelle De Groote, Linus Girdland Flink, Rizwaan Abbas, Silvia M. Bello, Lucia Burgio, Laura Tabitha Buck, Christopher Dean, Alison Freyne, Thomas Higham, Chris G. Jones, Robert Kruszynski, Adrian Lister, Simon A. Parfitt, Matthew M. Skinner, Karolyn Shindler, and Chris B. Stringer, "New genetic and morphological evidence suggests a single hoaxer created 'Piltdown Man'," *Royal Society Open Science* 3 (August 10, 2016), 1-14.

[633] Weiner, Oakley, and Le Gros Clark, "Solution of the Piltdown Problem," 146.

more generally. Fluorine could fill a gap, allowing fossilized materials that were too old (probably) for radiocarbon to be assessed relative to other fossils in the same deposit. It wasn't perfect, but it was useful for establishing whether a human fossil was an intrusive burial into an older deposit.[634] As the sensitivity of radiocarbon increased, though, it made more sense for researchers who suspected they had discovered an intrusive modern burial to turn to radiocarbon analysis first, because they might be able to get absolute, rather than merely relative, chronological data—particularly in circumstances where knowing that something was simply younger or older than something else in the same deposit was not especially interesting.

When the Piltdown materials were being investigated in 1953-1955, the possibility of using the newly developed radiocarbon dating techniques on the fossils was not seriously considered, as the process "would have involved total destruction of the specimens to provide the minimum quantity of carbon."[635] By the end of the decade, technical improvements in the sensitivity of the radiocarbon testing process and the concomitant decrease in the amount of original sample required made this radiocarbon analysis of the Piltdown material possible. By 1958, also, the British Museum had set up its own in-house radiocarbon laboratory, which began publishing lists of dates in 1959.[636] Working with Dutch radiocarbon specialist Hessel de Vries, Oakley published a paper in *Nature* in July 1959 reporting that testing showed the mandible to be

[634] Oakley oversaw many similar chronometric projects during the 1950s and into the 1960s; see Goodrum and Olson, 112-113.
[635] H. de Vries, K.P. Oakley, "Radiocarbon Dating of the Piltdown Skull and Jaw," *Nature* 184, no. 4682 (July 25, 1959), 224.
[636] H. Barker and C.J. Mackey, "British Museum Natural Radiocarbon Measurements I," *American Journal of Science Radiocarbon Supplement* 1 (1959), 81-86. (Mss OAK Notes 6.5, NHM) As in the US, building, calibrating, and maintaining the dating equipment required UK radiocarbon researchers to cultivate relationships with government nuclear research agencies. The NHM laboratory thanked the Atomic Energy Research Establishment at Harwell, home to Britain's first nuclear pile, for assistance in developing and maintaining the electronic counting equipment.

500 years old, plus or minus 100 years, and establishing a similar antiquity for the cranium (620 plus or minus 100 years).[637]

How exactly the hoaxer had gotten his hands on a half-century old orangutan jawbone was somewhat mysterious; Oakley wrote in a draft letter to Le Gros Clark that he had emphasized the "probability aspect" in order to cover his bases and admit that the very odd result could possibly be wrong.[638] "I am sure that your scepticism will not be reduced by my telling you that prior to de Vries carrying out his test I had come to the conclusion that the jawbone already looked ancient *before* the forger began to work on it," wrote Oakley. There was still (at least in Le Gros Clark's opinion) a role for the trained judgment of an expert that had not been outsourced to the radiocarbon process, and to provide a gut-check on the radiocarbon results, which could be skewed by contamination, either of the sample or the counting system. A six-hundred-year-old human cranium wasn't difficult to source in Britain—some casual grave-robbing in a sufficiently old churchyard perhaps—but a very old orangutan was more difficult. Ultimately, Oakley hypothesized that the mandible could have come from a dealer in curiosities or ethnographic material from southeast Asia, and, in fact, a comparison between the Piltdown mandible and orangutan jawbone in the Natural History Museum's collections, originally purchased in Sarawak in the nineteenth century, showed some similarities in nitrogen content and physical appearance.[639]

Fluorine dating had initially shown that—all questions about validity and evolutionary provenance aside—Piltdown Man was younger than the Pleistocene date estimated from its

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[637] H. de Vries and K.P. Oakley, "Radiocarbon Dating of the Piltdown Skull and Jaw," *Nature* 184, no. 4682 (July 25, 1959), 225.
[638] Oakley to Le Gros Clark, not dated but probably before July 25, 1959. The letter is a draft, and marked with "Not sent" in Oakley's handwriting. (Mss Oak Piltdown 1.24, NHM)
[639] de Vries and Oakley, "Radiocarbon Dating of the Piltdown Skull and Jaw," 225.

surrounding fossils. Radiocarbon dating, playing to its strengths, had been used to demonstrate that the fossil was instead a modern fake. But there were still plenty of paleoanthropological specimens that could not be absolutely assessed by radiocarbon, because they were almost certainly far too old, and could not even be relatively dated by the fluorine testing method, because they came from geological zones where fluorine levels were already extremely high, meaning that even relatively recent specimens appeared very aged after only brief acquaintance with local groundwater.

In 1947, when Kenneth Oakley was in Nairobi for the Pan-African Congress, he ended up in conversation with Mary and Louis Leakey about some of his preliminary ideas about fluorine dating.[640] As discussed in chapter 3, Oakley returned to London with an enormous collection of rock and fossil samples for the British Museum—but also with small samples from the tendentious Kanam and Kanjera specimens that had torpedoed Louis's scientific credibility in the 1930s. Regretfully, the fragments continued to defy attempts to date them; Oakley and his collaborators at the Office of the Government Chemist discovered the fragments were completely saturated with fluorine, which was found in high quantities in exactly the kind of volcanic sediment that defined most of the Kanam and Kanjera regions, and many of the other really interesting East African dig sites that the Leakeys were exploring.

In January 1953, Oakley had another opportunity to commune with paleoanthropologists on their home turf, although this time he went to Northern Rhodesia (Zambia) and South Africa rather than Kenya and Tanzania, to investigate relative ages of the Australopithecines using fluorine dating.[641] Because many of the *Australopithecus* fossils had been unearthed during

[640] Goodrum and Olson, 106-107.
[641] See K.P. Oakley South Africa notebook extracts, January-March 1953 and "Preliminary Report on Dr. K.P. Oakley's visit to Southern Africa," both MSS OAK Notes 8.2, NHM. The trip was funded by the Wenner-Gren Foundation, which was also interested in supporting further development and application of

mining excavations, it was difficult or impossible to establish their approximate age. If Oakley could establish even rough correlations between the fluorine levels of the fossils and the stratified breccia near where they had been found, it would be possible to assign rough ages to them, as well as place the varying types of Australopithecines in chronological order relative to each other.

Oakley spent February and March 1953 collecting samples of bone and rock at Taungs, Sterkfontein, Swartkrans, Kromdraai, and Makapan, as well as examining the Australopithecine material held at the Transvaal Museum and in the anatomy department at Wits.[642] He also joined archaeologist Clarence Van Riet Lowe on some surveying trips to look at gravel beds in the Vaal region, where they discovered a series of pebble tools in a gravel layer that seemed very similar to the layers in which *Australopithecus* had been found at other sites. There was little material that was suitable for fluorine testing, although Oakley compared the fluorine levels in Dart's original *Australopithecus* from Taungs to a sample of bone from a nearby sample of breccia that had been assigned to the late Pleistocene. He found that the amount of fluorine (approximately 1.0%) was the same in both samples, although he noted that the mineral composition of the breccia was terrible for the transmission of fluoride ions in solution, and so the amounts were probably artificially low.[643]

In his final summation of the relative ages of the different South African Australopithecines, Oakley clustered them into two groups, one from the early Pleistocene and one from the middle Pleistocene, but admitted that this judgment was based on a number of

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fluorine dating, especially for the problem of "Early Man in Africa." See K.P. Oakley, "Report on Research and Study Rout in Africa, January to April, 1953," MSS OAK Notes 8.2, NHM, and K.P. Oakley, "Dating the Australopithecinae of Africa," *American Journal of Physical Anthropology* 12, no. 1 (March 1954), 9-28.

[642] "Preliminary Report on Dr. K.P. Oakley's visit to Southern Africa." (MSS OAK Notes 8.2, NHM)

[643] Oakley, "Dating the Australopithecinae," 13.

different methods for assessing fossil age, including estimations of historical rainfall patterns and the physical appearance of the breccia matrix. The pebble tools had not been found in association with any of the Australopithecines, but they appeared to be of approximately the same geological age. Given their small brains, though, Oakley rejected the hypothesis that these pebble tools could have been made by *Australopithecus*, instead favoring the explanation that there must have been a second, more advanced hominin type that co-existed with the Australopithecines. If this mystery hominin was contemporaneous with *Australopithecus* but lived in a different biotope, it would nicely explain where the pebble tools fell in the geological and chronological landscape.[644] All these conclusions were, however, conjectures—even Oakley acknowledged that there were many gaps in his evidence base.

In a talk at Wits on March 10, 1953, Oakley described the challenges and limitations of fluorine dating:

> It would be obviously impossible to ascribe a geological age to an isolated fossil bone on the evidence of its fluorine content, because there is such wide variation in the abundance of fluorine at different localities. Moreover, there is a probability that the abundance of this element in groundwater at any particular locality has fluctuated in the course of time, and this rules out the possibility of establishing an absolute time-scale on the basis of the graduation of fluorine.[645]

The best fluorine dating scenario was exactly the one that had arisen at Piltdown, where a collection of fossils had been found at the same site, some of which were well-known in other localities and had been indexed to an approximate geological period, and some of which were unique to the site. "To the 'man-in-the-street'," Oakley said at Wits, "it is much more exciting to

[644] "Preliminary Report on Dr. K.P. Oakley's visit to Southern Africa" (MSS OAK Notes 8.2, NHM) and Oakley, "Dating the Australopithecinae," 17-21.
[645] Kenneth P. Oakley, "Fluorine," University of the Witswatersrand, Johannesburg, March 10, 1953. (MSS OAK Notes 8.2, NHM)

be told that a certain specimen is 100,000 years old, than to be told that *this* specimen is certainly Middle Pleistocene, and *that* specimen is Upper Pleistocene."

> But at present there is no known method by which a fossil can be dated directly in years, at any rate beyond the range of the radio-carbon method, which dates carbon-bearing specimens up to 20,000 years.[646]

Fluorine testing was at its best when trying to detect whether a given fossil—like a *Homo sapiens* amid a collection of early Pleistocene fauna—was contemporary with the better-known fossils around it. As a tool, it very much reflected the question that was most often asked of hominin fossils with dubious antecedents found in older geological deposits: was a specimen an intrusive burial (as Boswell had decided was the case with Leakey's Kanam and Kanjera finds) or was it truly as old as it seemed? Even if a doubtful hominin could be placed in approximately the same geological period as its associated fauna, there was still a question of how much time had passed since that species had lived, in absolute terms. That answer would potentially clarify the tempo as well as the mode of human evolution—a subject of interest to many experts, as well as Oakley's man-in-the-street.

Fluorine couldn't answer this question, and radiocarbon, while ample for tracing the migration of human culture, couldn't go back far enough to be used to assess hominin fossil finds. But it was clear, increasingly, that hominins were also very, very old, while racial and cultural differentiation in *Homo sapiens* was recent, at least in terms of geological time. The more that radiocarbon dating established that "recent" human migration and cultural development dated back multiple thousands of years, the more that it became apparent to observers that a vast span of time separated out the emergence of humanity from the emergence

[646] Oakley, "Fluorine," 1. (MSS OAK Notes 8.2, NHM) Oakley's 20,000-year cut-off for radiocarbon here is a little conservative even for the mid-1950s.

of writing, or the growth of the earliest river valley civilizations, or the attested historical or mythic existence of figures of European prehistory who had been anointed as ancient anchors of the heroic national past in the heady days of late nineteenth century state-building.[647] "Our ancestors the Gauls" were mere *arrivistes* compared to a paleo-historical record that showed someone had been burning charcoal and sketching aurochs and wild deer on the walls at Lascaux 17,000 years in the past. But it was also virtually impossible to draw a direct connection between those prehistoric peoples and modern day inhabitants of the Dordogne region in southwestern France where the caves were located. The older a human cultural artifact was, the more universal it became.

Universal Prehistory and the Practice of Internationalism

Part of the enormous political and social value of this work in paleoanthropology and prehistory was the way that it fit into the internationalist dynamics of the postwar world. In 1948, leading representatives of the newly established United Nations Educational, Scientific, and Cultural Organization (UNESCO) announced a plan for a "history of peaceful relations" between different human groups and societies, encompassing the history of the entire world and highlighting the fundamental unity of human civilization.[648] One goal was to produce material

[647] On European nationalism and the creation of origin myths for the nation-state, see Benedict Anderson, *Imagined Communities: Reflections on the Origin and Spread of Nationalism* (London: Verso, 1983); Eric Hobsbawm and Terence Ranger, eds. *The Invention of Tradition* (New York: Cambridge University Press, 1983); and (in the specific mode of prehistory and nineteenth century European nationalism) Chris Manias, *Race, Science, and the Nation: Reconstructing the Ancient Past in Britain, France, and Germany* (New York: Routledge, 2013).

[648] See discussion in Lucien Febvre, "Report of the Beyrouth Conference to the French National Commission," *Notes et Études documentaires*, no. 1080, 26 February 1949, 9-13, 19. These spokesmen included Lucien Febvre, Joseph Needham, Julian Huxley, Charles Morazé, and Paul Rivet. See Patrick Petitjean, "The Ultimate Odyssey: The birth of the *Scientific and Cultural History of Mankind* project," in Petitjean et al., eds. *Sixty Years of Science at UNESCO 1945-2000* (Paris: UNESCO, 2006), 85-88.

for educational materials that could be distributed by UNESCO around the world promoting worldwide understanding "of the mutual inter-dependence of peoples and cultures and of their contributions to the common heritage."[649] But the UNESCO world history project was also about promoting a particular vision of global human unity that would underscore the importance of international collaboration, both in the aftermath of Holocaust and the Second World War, and in the opening stages of the global Cold War.

Between 1948 and 1951, the UNESCO history's editorial committee came to see the history of humankind as driven by exchanges between civilizations.[650] Of these, they especially emphasized exchanges leading to new scientific knowledge and the development of new technologies, which in turn generated new directions in human culture. The committee also emphasized that as UNESCO was engaged in writing a world history, European culture should not be considered as the paradigmatic model or necessary endpoint for the development of all human civilizations.[651] Ideally, the text would even become the basis of a new series of textbooks for schoolchildren around the world, which would both address the varying needs of national educational systems in the new international age, introducing the next generation of "world citizens" to a vision of a shared, exchange-oriented past that would give rise to a peaceful, collaborative future.[652] Under the title *Scientific and Cultural History of Mankind,*

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[649] Resolution 5.7, "Scientific and Cultural History," Human and Social Relations, "Resolutions Adopted by the General Conference During Its Second Session," Mexico, November-December 1947 (Paris: UNESCO, April 1948), p. 27.
[650] Petitjean's "The Ultimate Odyssey," gives an excellent schematic overview. See also Paul Betts, "Humanity's New Heritage: UNESCO and the Rewriting of World History," *Past and Present* 228, no. 228 (August 2015), 249-285; and Poul Duedahl, "Selling Mankind: UNESCO and the Invention of Global History, 1945-1976," *Journal of World History* 22, no. 1 (March 2011), 101-133. On the history of science in UNESCO more broadly, see Perrin Selcer, "Patterns of Science: Developing Knowledge for a World Community at UNESCO" (Ph.D. Dissertation, University of Pennsylvania, 2011).
[651] Gilbert Allardyce, "Toward World History: American Historians and the Coming of the World History Course," *Journal of World History* 1, no. 1 (Spring 1990), 32.
[652] On UNESCO's program for revolutionizing primary and secondary school textbooks, see Herbert Abraham, "How Biased Are Our History Textbooks?" *The UNESCO Courier* 9, no. 3 (March 1956), 5-6;

UNESCO's history project was placed in the charge of American historian Ralph E. Turner, who in turn began recruiting authors to collaborate on each of the planned six volumes.

It made perfect sense to begin this narrative at the very beginning, with the origin of humankind. "The opening of any full history of man," wrote British prehistorian Jacquetta Hawkes in 1953, "must be its Book of Genesis, the story of man's creation."[653] Trained as an expert in European Neolithic and Bronze Age archaeology, Hawkes had more than a decade of experience leading archaeological digs in France, Palestine, Ireland, and Great Britain. [654] During the Second World War, she worked first in the British War Cabinet offices before transferring to the Ministry of Education, where she produced educational films and other visual material. At the end of the war, Hawkes was appointed Secretary to the U.K. Commission for UNESCO, although she resigned from the civil service in January 1949 to have more time to write; her book *A Land*, which was an imaginative non-fictional narrative of the prehistory of Britain, was published in 1951 and was a bestseller in Britain in the 1950s.[655] That same year, she also served as an archaeological advisor to the Festival of Britain—her special focus was the "Origin of the People of Britain" pavilion in an exhibition in London's South Bank exhibition site. She was invited by Turner in November 1951 to join the *Scientific and Cultural History* project as one of

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and Ronald Fenton, "Asia Through Western Glasses: Nations Take a Fresh Look at Their Textbooks," *The UNESCO Courier* 9, no. 3 (March 1956), 7-13. The school textbook reform program was a source of difficulty for several UNESCO member states, including Japan and the Soviet Union. For a brief introduction to a large and complex history, see Aigul Kulnazarova, "Debating international understanding in the Eastern world: UNESCO and the Soviet Union," in Aigul Kulnazarova and Christian Ydesen, eds. *UNESCO Without Borders: Educational Campaigns for International Understanding* (New York: Routledge, 2016), 256-274.

[653] Jacquetta Hawkes, "Introduction to Volume I – Part 1, preliminary draft," June 29, 1953, 1-15. SCHM box 29, 2.83 (2) Jacquetta Hawkes Vol. I-2 (UNESCO Archives, Paris).

[654] Biographical note, Jacquetta Hawkes, June 1953. File 2.83(1), SCHM 1/28, UNESCO archives.

[655] Jacquetta Hawkes, *A Land* (New York: Random House, 1951). On *A Land* as a bestseller and literary touchstone for postwar Britain, see discussion in Robert MacFarlane, "Rereading: A Land by Jacquetta Hawkes," *The Guardian*, May 11, 2012. https://www.theguardian.com/books/2012/may/11/rereading-a-land-jacquetta-hawkes

two authors responsible for the planned first volume of the history, with the working title "Prehistoric and Ancient Times, Covering the Development of Peoples and Cultures to about 1200 B.C."[656]

As she began drafting the introduction to the first volume of the *Scientific and Cultural History*, Hawkes grounded her narrative (and by extension the entire UNESCO world-historical project) in the deep evolutionary history of the human species. Although this set her work apart from the rest of the project, which would be more conventionally oriented around people and societies, it was entirely necessary. "All later parts of the *History of Mankind* will be introduced by some account of how the content of the particular phase with which they are concerned…are to be related with what went before," wrote Hawkes.[657]

> Here, at the beginning of it all, the position is rather different, for in looking back we do not see a stretch of human history leading up to our point of continuation, but instead an immense vista of natural history. A tremendous perspective of landscape and living forms, but not a glimmer of science or culture!

And yet, Hawkes continued, her position was not all that different. The prehistoric period had received just as much of an "immense and powerful" inheritance from the previous prehuman era as any other period of more conventionally delineated human history had received from its predecessor. The bodily form of modern humanity had evolved over many, many centuries, with its "subtly elaborated brain" as well as the "highly charged emotional centers and all the strange, ancient furniture of the unconscious mind."[658] It was possible (although only as a hypothesis, and not universally accepted) that the "shadowy, deep-seated memories of the experience of the

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[656] R.E. Turner to J. Hawkes, 26 November 1951. File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO archives, Paris; and Paulo de Berrôdo Carneiro to Jacquetta Hawkes, 22 November 1951. File 2.83(1), SCHM 1/28, UNESCO. Her first co-author was the Dutch Egyptologist and archaeologist Henri Frankfort; after his sudden death in 1954, British archaeologist Leonard Woolley took over Frankfort's portion of the work.
[657] Hawkes, "Introduction to Volume I – Part 1, preliminary draft," 3.
[658] Hawkes, "Introduction to Volume I – Part 1, preliminary draft," 4.

evolving animal" lay somewhere deep within the universal subconscious of modern humans, generating the images and ideas that inspired artistic production and made human art "universally evocative." Culture and science as they were practiced today might not make an appearance in her text, Hawkes was saying, but their roots lay deep in human history, and it was her period of study that would make those roots apparent.

Anyone who considered the long history of humans in the world, Hawkes wrote, could see how "time has set a vast gulf" between the river valley urban centers of ancient Iraq and Egypt and the modern global metropolises of New York, London, and Moscow, but this gulf of time was the focal point of the other five volumes of UNESCO's planned six-volume history. Equally tremendous changes had taken place between the evolutionary emergence of early humans and the founding of the river valley civilizations. "The enormous longueurs of prehistory may make our minds yawn, yet momentous, irreversible events took place during those uncalendared ages," Hawkes concluded. These experiences were common across all human groups—the prehistoric period preceded the division of human society. These events during the earliest phases of development "did much to determine the pattern of the ancient civilizations," and continued to shape the paths of human societies in the twentieth century.

The *Scientific and Cultural History* was part of a bigger flourishing of works of global or world history in the 1950s and 1960s—many of which similarly began their stories with a consideration of human evolution.[659] William McNeill's 1963 *The Rise of the West*, probably the

[659] The distinctions between "world history" and "global history"—not to mention their frequent fellow travelers "transnational history" and "international history"—are epistemically meaningful, but also have specific histories, and have occupied different places within national historical communities; e.g. "world history" and "histoire mondiale" are not necessarily analogues. I would argue that the distinction between, say, global history and international history is meaningful, but that the boundaries are also significantly blurred in practice, both within specific scholarly works and over the course of an individual's career. On the current intellectual dimensions of global history, see Sebastian Conrad, *What Is Global History?* (Princeton: Princeton University Press, 2016). For a different perspective, see Bruce Mazlish,

most commercially popular of these works, began with the birth of the first urban civilizations, but many others, such as Leften Stavrianos' *A Global History of Man* opened with the birth of *Homo sapiens*.[660] Paleolithic history allowed authors to ground their story in a period of primordial human unity, before the development of states and cultures that would foreground the human divisions rather than common strengths. The French historian Charles Morazé, one of the early consultants on the *Scientific and Cultural History*, was also involved with a contemporaneous French book project, the *Histoire Générale des Civilisations*. It began the first chapter with the heading "From Paleolithic Unity to Historical Diversity" – a succinct summation of the spirit in which paleoanthropology and prehistory were mobilized.

Nonetheless, most of these projects were written by a single author or by a small group based at the same university or at least in the same country. The UNESCO world history project, however, was not only international in its scope, but was also meant to be international in its mode of production. When selecting authors to take charge of each volume, Turner and his editorial committee paid close attention to each candidate's formal credentials, but also to his or her national affiliations. The editorial committee itself had members from Brazil, the United States, the United Kingdom, Switzerland, France, Syria, India, Italy, and Mexico. Hawkes and her co-authors Woolley and Frankfort were selected for volume I in part because the region in

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"Comparing Global History to World History," *Journal of Interdisciplinary History* 28, no. 3 (Winter 1998), 385-395. On the distinctive traditions of world history since the mid-twentieth century, see Jerry H. Bentley, "The Task of World History," in Jerry H. Bentley, ed., *The Oxford Handbook of World History* (Oxford: Oxford University Press, 2011), 1-18.

[660] Leften S. Stavrianos, Loretta Kreider Andrews, Goerge I. Blankstein, Roger F. Hackett, Ella C. Leppert, Paul L. Murphy, and Lacey Baldwin Smith, *A Global History of Man* (Boston: Allyn and Bacon, 1962). This practice continues to the present: see chapter one, "Becoming Human" in the most recent edition of *Worlds Together, Worlds Apart*, a hallmark global history textbook published in the United States. See Robert Tignor, Jeremy Adelman, Stephen Aron, Peter Brown, Benjamin Elman, Stephen Kotkin, Xinru Liu, Suzanne Marchand, Holly Pittman, Gyan Prakash, Brent Shaw, and Michael Tsin, *Worlds Together, Worlds Apart: A History of the World from the Beginnings of Humankind to the Present*, new ed. (New York: W.W. Norton, 2014).

which their respective homelands (Britain and the Netherlands) were situated had played no significant role in world history during the historical era they were researching and presenting.

Beginning in January 1952, the authors were given five years to research and write their assigned portions of the text, although they were also asked for detailed outlines and draft introductions as early as 1953. Each author was also given the power to request or commission academic articles for publication in UNESCO's scientific-historical journal, the tri-lingual *Cahiers d'histoire mondiale—Journal of World History—Cuadernos de Historia Mundial*, which was also edited and published under the aegis of the International Commission for the Scientific and Cultural History of Mankind. These articles fulfilled a dual purpose—they brought recent academic research to a wider reading public, and provided up-to-date information for the *Scientific and Cultural History* authors to synthesize in their own work. Recruiting authors to write pieces for the *Cahiers* also helped bring in broader international perspectives. When Hawkes submitted her list of author and subject requests to Armando Cortesão, the secretary general of the Commission, she requested work from experts in India, China, Denmark, Sweden, Egypt—although, of the sixteen listed individuals, nine were from either the United States or the United Kingdom, and a further two were from a British colony (Louis Leakey, Kenya) and a commonwealth nation (A.J.H. Goodwin, South Africa).[661]

Like the sample gathering networks that were mobilized during the worldwide assay in the radiocarbon dates project, there was a particular geography to the expertise that Hawkes requested and deployed. Proximity and access certainly played a role. For example, Hawkes could easily telephone British experts like Kenneth Oakley and Wilfrid Le Gros Clark or invite them to lunch, but sending a letter to Chinese paleoanthropologist W.C. Pei inviting him to

[661] Jacquetta Hawkes to Armando Cortesão, March 7, 1952. File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO.

submit an article to the *Cahiers* on *Sinanthropus* and the Zhoukoutien dig required Hawkes and UNESCO to send an official invitation via the sinologist, chemist, and historian Joseph Needham in Cambridge, who then forwarded the message to the President of the Chinese Academy of Sciences, and from there on to Pei.[662] The underlying idea was that authors like Hawkes could lean on the subject-area expertise of an assortment of international experts—both in the initial research and drafting stage and during the text review process, scheduled to begin in 1957. Each author's text would be vetted by readers around the world in two categories: selected international experts in the field or period of history under review, and the national commissions of UNESCO member states—who either reviewed the material themselves or passed the text on to subject experts in their home countries.[663] The goal was to enshrine the internationalist perspective as much as possible; the national biases and personal points of view of the authors would, presumably, be corrected by receiving critical feedback from a diverse group of international readers. The national communities were conceived as fundamentally important to the *History*: "By means of such counsel and advice," wrote Guy Métraux in 1952, the national commissions would help "…ensure an accurate and impartial treatment of all cultural, religious, and national aspects of history and thereby enlarge our understanding of the development of mankind."[664]

[662] Jacquetta Hawkes to Guy Métraux, September 23, 1952. File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO. No article by Pei appeared in the *Cahiers*.
[663] Paulo de Berrôdo Carneiro to Jacquetta Hawkes, 22 November 1951. File 2.83(1), SCHM 1/28, UNESCO.
[664] Guy S. Métraux, "UNESCO – International Commission for a Scientific and Cultural History of Mankind," *Revista de Historia de América*, no. 34 (December 1952), 559.

Unlike many of the authors of other sections, Hawkes met her deadline.[665] Volume one part one of the *Scientific and Cultural History* was received by reviewers in August 1957, and nineteen out of UNESCO's seventy-seven member states returned remarks.[666] The resulting reviews ranged in length from one page (Norway) to seventeen pages (the Soviet Union), and covered a wide gamut of suggestions, objections, clarifications, and useful citations from paleoanthropological and archaeological literature in several languages.[667] Some readers noted typos and inquired about the proposed illustrations.[668] Other national delegations focused on errors of fact: the committee representing Pakistan, attentive to political geography and shifting borders, provided forty-five instances where the words "India" or "Indian" had been used inappropriately, while William C. Sturtevant, representing the United States, contributed ten increasingly incensed paragraphs critiquing the treatment of the evolution of language, covered in the draft chapter five.[669] The most common criticism was of the type "needs more Country X."

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[665] For the history of the delays of volumes six and four of the *Scientific and Cultural History*, see Betts, "Humanity's New Heritage: UNESCO and the Rewriting of World History," and Duedahl, "Selling Mankind: UNESCO and the Invention of Global History, 1945-1976."

[666] Guy S. Métraux, SCH/Memo/No. 775, 10 July 1957. File 2.83(1), SCHM 1/28, UNESCO. The nineteen countries were: Afghanistan, Australia, Austria, Bulgaria, Ceylon, Czechoslovakia, Finland, France, Israel, Italy, Japan, Norway, Pakistan, Poland, Romania, Spain, Turkey, the United States, and the Soviet Union. This means the document was sent out for comments from 48% of the European countries that were then UNESCO members, 26% of the Asian countries, and 50% each of the countries in Oceania and Northern America (although the only other member nations in these regions were New Zealand and Canada, respectively, and those two regions contributed only 3% each of the total UNESCO membership). While Latin America and the Caribbean countries made up 26% of the total UNESCO membership, zero reviews were requested from countries in that region. It's unclear from the archive whether these were the only countries asked to comment on this volume; if other countries were given responsibility for other volumes; or if the entire UNESCO membership was solicited, and only a small number finished reading the more than 800 pages of final manuscript.

[667] "Reports from Scholars and National Commissions, Vol. I-1." File 2.84(6), SCHM 1/38, UNESCO. See for example, the reports by the Members of the Faculty of Hebrew University (representing Israel) and by Professor Mizuno Seiichi, Kyoto University (representing Japan). All reports were submitted in either French or English.

[668] Prof. Dr. Muzaffer Senyürek, University of Ankara, representing the Turkish National Commission for UNESCO: "On p. 52…Sabat looks like a typing error; I think you meant Rabat." File 2.84(6), SCHM 1/38, UNESCO, pp. 3.

[669] Dr. Mahmud Husain, Dr. I.H. Qureshi, Dr. Moinul Haq, Mr. Nurus Safa, and Mr. R. Curiel, "Comments, by the Ministry of Education of Pakistan," File 2.84(6), SCHM 1/38, UNESCO, pages 1 and

Over and over, national commissions noted that while the story was rather good as it stood, what it really needed was, for example, in the case of Norway, more Norway. On one hand, this was exactly what the national commissions were supposed to be doing. Authors had been asked to pursue an impartial, universal, and international viewpoint in their writing, but it was acknowledged from the outset that it was impossible for a single person to completely escape the gravity well of his or her specific training, biases, and national perspectives. On the other hand, the feedback "needs more Norway" or "needs more Afghanistan" could be read as cases where countries were trying to make a case for their own significance in the universal human story. Was a given prehistoric find in, for example, Norway, truly important to all humankind – or just to Norway?[670]

In the name of internationalism and scientific objectivity, some categories of human difference were effaced, while others were naturalized. Gendered difference, for example, was never foregrounded; the terms "man" and "mankind" were used as the universal default. In volume one, both the imagined prehistoric hominins and the imagined modern reader were consistently, explicitly gendered male, in both Hawkes' drafts and the reports from the independent scholarly reviewers and the national commissions. The scientific convention of referring to hominin fossil finds as "Somewhere Man" was continued, even when osteological analysis of the pelvises of certain finds suggested that the original hominin had been female. During the scholarly review period, the American anthropologist, and well-known chauvinist, Carleton Coon returned lengthy, patronizing comments on Hawkes' draft, noting among other

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5. Hawkes made fewer errors than Woolley, eighteen to his thirty-three. For the United States, see William C. Sturtevant, "Chapter V, sections on language," in "Comments by Staff Members of the Smithsonian Institution (on behalf of the United States National Commission for Unesco)." File 2.84(6), SCHM 1/38, UNESCO, pp. 5-7.

[670] See Prof. Alf Sommerfelt, on behalf of the Norwegian National Commission for Unesco, File 2.84(6), SCHM 1/38, UNESCO, pp. 1. Norway represents a very clear-cut example of this phenomenon.

small nit-picks that the well-known Neanderthal fossil referred to as Steinheim Man was increasingly believed to be a female skeleton. Hawkes wrote in a chillingly firm rejoinder to Carleton Coon, "Being a humble woman myself, I am accustomed to the idea that woman is comprised within the general term Man. Surely this is common usage? E.g. Neanderthal Man and all the rest. My use of the term Steinheim Man has no sexual implications."[671] Hawkes chose to uphold scientific convention, subsuming 'woman' within the naturalized category of 'Man,' a practice that would continue, at least in Anglophone paleoanthropology, for many subsequent decades.[672] Coon was the only reviewer who received a direct, public reply from Hawkes, which was circulated to both UNESCO and the national commissions. She found it necessary to respond not so much to his criticisms on points of fact, but to his tone: "Dr. Coon expresses himself in a bluff and often deliberately incautious manner which is refreshing after too much pale caution, but which makes his criticisms sound much larger and more devastating than they are."[673]

Race and racial difference were foregrounded much more explicitly than gender in Hawkes' draft and final texts. Above all, Hawkes wanted to emphasize the underlying biological unity of the human species, while making a profound argument for racial pluralism as a source of human strength: "All races are one in that they can mate together and produce children who may be healthy, fertile, beautiful and intelligent, yet in their remaining separate and various lies one

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[671] Jacquetta Hawkes, "A Reply to Comments by Carleton S. Coon on Volume I, Part 1," File 2.84(6), SCHM 1/38, UNESCO, p. 2.

[672] Readers may notice the use of the non-gendered terms "human" and "humankind" in this dissertation, the midcentury grandeur of "The Origins of Man" and "The History of Mankind" notwithstanding. On this topic, see Mrs. Lintott, in Alan Bennett's play *The History Boys*: "…but having taught you all history on a strictly non-gender orientated basis, I just wonder whether it occurs to any of you how dispiriting this can be?" Alan Bennett, *The History Boys* (London: Faber & Faber, 2004), 83.

[673] Jacquetta Hawkes, "A Reply to Comments by Carleton S. Coon on Volume I, Part 1," File 2.84(6), SCHM 1/38, UNESCO, p. 1. See also Jacquetta Hawkes to Guy S. Métraux, 27 November 1957. File 2.83(1), SCHM 1/28, UNESCO.

of the delights of the existence of man on earth… Without this variety our future would be less abundantly promising just as our past would have been infinitely the poorer."[674] It was very much a late 1950s UNESCO-typical framing, that attempted to square the circle between the emergent anti-racist liberal political orthodoxy, on the one hand, and the adamantine refusal of physical anthropologists and other scientific practitioners, on the other, to drop "race" as *the* underlying principle for categorizing human beings.[675] The live nature of the debate was clear in the draft comments from the Australian national commission, which were entirely the work of anthropologist Ronald M. Berndt. He found Hawkes' discussion of racial difference in the initial draft to be "quite unsatisfactory as it stands," since the divisions between racial groups were given "as an arbitrary one." He also wanted Hawkes to add a brief discussion "on the fluidity of the concept of 'race,'" that would perhaps talk about new research in "classification on the basis of genetic characteristics … and especially to modern studies of blood-grouping."[676]

However, Berndt was the only reviewer among the national commissions who called attention to the ways that Hawkes dealt with concepts of racial similitude and difference. Trained as an anthropologist rather than a prehistorian, archaeologist, or paleontologist, Berndt brought a different set of professional and personal preoccupations to the material. In the eyes of the elite, almost entirely male reviewers, overwhelmingly originating in European countries, neither race

[674] Jacquetta Hawkes, *History of Mankind: Prehistory and the Beginnings of Civilization*, published for the International Commission for a History of the Scientific and Cultural Development of Mankind (New York: Harper & Row, 1963), 59-60.
[675] Perrin Selcer, "Beyond the Cephalic Index: Negotiating Politics to Produce UNESCO's Scientific Statements on Race," *Current Anthropology* 53, no. S5, The Biological Anthropology of Living Human Popualtions: World Histories, National Styles, and International Networks (April 2012), S173-S184. In 1985, half of American physical anthropologists surveyed believed in race as a biological category. See Matt Cartmill, "The Status of the Race Concept in Physical Anthropology," *American Anthropologist* 100, no. 3 (September 1998), 652.
[676] Professor Ronald M. Berndt, University of Western Australia, representing the Australian National Commission for UNESCO. File 2.84(6), SCHM 1/38, UNESCO, p. 1.

nor gender became categorical fault lines in the universalist narrative. National difference was recognized and explicitly removed from the political outlook of the *Scientific and Cultural History* project; other forms of difference, meanwhile, were effaced by the norms of "objective" scientific practice.[677]

Despite the growing importance of Africanist paleoanthropology, no commentators from African nations were invited to review Hawkes' document, nor were any African national commissions asked for comments. In part, this was because there were only seven African members of UNESCO in the fall of 1957.[678] Most the continent was still made up of what UNESCO and the UN euphemistically termed "non-self-governed territories," which were also distinct from the UN trust territories. The all-important "internationalist perspective" described by Métraux only worked through the nation-state; colonial territories didn't fit and therefore didn't have a voice. The mismatch between the rhetoric of the *Scientific and Cultural History* (and UNESCO writ large) and the realities of colonial rule become even more apparent when looking at the patterns of international reviewing of this purportedly universal human history, which began with archaeological and paleontological evidence taken from parts of the world with no self-determination or direct representation in the UN.[679] This was a fundamental paradox

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[677] On gender and the construction of scientific objectivity, see Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective," in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 183-201.

[678] Egypt, Liberia, Libya, Ethiopia, Morocco, Tunisia, and Sudan. Ghana joined UNESCO in 1958; then seventeen newly independent African nations joined in 1960, beginning with Guinea in February.

[679] On this topic, see Susan Pedersen, *The Guardians: The League of Nations and the Crisis of Empire* (Oxford: Oxford University Press, 2015); Mark Mazower, *No Enchanted Palace: The End of Empire and the Ideological Origins of the United Nations* (Princeton: Princeton University Press, 2009); and Mark Mazower, *Governing the World: The History of an Idea* (New York: Penguin Press, 2012). The Union of South Africa, as a white settler state that was also a member of the British Commonwealth, occupied a different political position in the UN and UNESCO. South Africa, however, was not eligible to review the manuscript, because the Union had withdrawn from UNESCO in 1956, protesting UNESCO's unflattering coverage of apartheid in several publications. See Otto Klineberg to Luther Evans, SS/Memo/54/4823, 6 January 1954. AG 8 Secretariat records, Sub-subseries X07.21 (68.01) - Union of South Africa. UNESCO archives online, uploaded 16 May, 2011.

of the entire postwar internationalist system in the 1950s, and also a deep irony about using fossil and archaeological material discovered in colonial contexts as the basis for an implicit historical argument about the shared rights, responsibilities, and privileges of a universal humankind.

Stick-Wielding Monkeys and People in Groups

Hawkes' 1953 draft of her section introduction laid out the geographic starting point for her tale. "For many years it was held to be most likely that the earliest human species originated in Asia," she wrote, "probably in some region along the southern slope of the Himalayas, but it is now very generally agreed that the African continent was the birth-place of mankind."[680]

> The opening of a human history must, therefore, begin by showing how creatures showing human and simian characteristics very nearly balanced lived in Africa, probably late in the Pliocene, and there gave rise to the earliest beings that can be identified as men both from their bodily characters and from their ability roughly to shape stone and wood to suit their purposes.[681]

Tool-crafting behavior was the starting point of human culture, "the beginning of that vast and varied creation" that dominated human activity to the present day. Parts of Asia had been settled by these tool-making early humans at a very early stage—perhaps immediately after "mankind" had emerged in Africa—and Hawkes described how these voyaging populations had quickly established a new center for cultural and physical development (a gesture towards racial differentiation). "In fact," she wrote, "we shall find that from very early times there were to be two great cultural traditions, one cradled in eastern Asia, the other in Africa." Hawkes waffled in

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Https://atom.archives.unesco.org/union-of-south-africa The pamphlets in question were: Kenneth Little, "Race and Society," and Arnold Rose, "Roots of Prejudice." On the same topic, see Michele Brattain, "South Africa's "Strange" Relations with UNESCO: Antiracism versus apartheid," in Aigul Kulnazarova and Christian Ydesen, eds. *UNESCO Without Borders: Educational Campaigns for International Understanding* (New York: Routledge, 2016), 220-235.

[680] Hawkes, "Introduction to Volume I – Part 1, preliminary draft," 5.

[681] Hawkes, "Introduction to Volume I – Part 1, preliminary draft," 5.

the draft over whether these prehistoric tool cultures in Asia were created by "more ape-like species of the type of *Pithecanthropus*" while the African cultures were the project of *Homo sapiens*, and tried to assess what role, if any, the Pithecanthropoids like Peking Man and Java Man might have played in the evolution of human cultural life. She suggested that *Pithecanthropus*, like the Neanderthals, represented a less advanced human branch that interbred into the population of *Homo sapiens* when that species finally left Africa for the wider world. In Hawkes' marked-up copy, the entire paragraph was crossed out, although it was reinstated with only minor copy-edits in a clean version of the same document.[682]

The African origins of humankind were a minor point for Hawkes. It was important as the foundation and starting point of the work, but the bulk of her narrative history concerned the evolution of culture and the migrations of stone tool-using human prehistoric societies outside the African continent (which was still not as extensively excavated as parts of Europe or Asia). In the introduction draft, she wasted little time moving on from Africa and the evolution of humans.

Hawkes was confident that the African origins hypothesis represented the current consensus view. While the transition from an Asian to an African point of origin was recent, Hawkes' immediate circle of scientific experts included several people who were among the first to have accepted and championed this perspective. Her 1952 list of requests for the *Cahiers* included articles by 1947 Pan-African Congress veterans Wilfrid Le Gros Clark and Kenneth

[682] Compare Hawkes, "Introduction to Volume I – Part 1, preliminary draft," 6 in box 29, folder 2.83(1) with Hawkes, "Introduction to Volume I – Part I, preliminary draft," 5-6 in box 28, folder 2.83(1), both UNESCO. The version from box 29 is typed but edited in Hawkes' handwriting and signed by her on the last page. The version in box 28 is typed on the standardized UNESCO office typewriter and typing paper (consistent with other internal memos and the collated versions of the *Scientific and Cultural History* reader reports), and the slightly different line formatting means the pages do not map between versions. The box 28 version is undated, but it is clearly the final version of Hawkes' draft, which is dated June 29, 1953. Unless specified, all citations are to the dated, hand-edited version from box 29.

Oakley, as well as prehistorian Dorothy Garrod (one of Hawkes' former tutors at Cambridge and her collaborator on field expeditions in the 1930s), who had not attended the Congress but had also been convinced by the groundswell of geological, archaeological, and paleontological evidence that supported African origins. Garrod's article for the *Cahiers*, published in July 1953, discussed the comparative bodies of evidence for Asian and African origins in the second paragraph, pointing out that the attractiveness of the Asian hypothesis had rested in part on how little was known about Asian prehistory, and that Africa, "with its remarkable anthropoid fossils and its extraordinary wealth of hand-axe industries is now the first favorite as the cradle of mankind."[683] Le Gros Clark was asked to write a piece on the position of *Homo sapiens* in the hominin evolutionary line, and Oakley on the glacial sequence in the northern hemisphere in relation to the migrations of human groups in the Pleistocene period.[684] Neither of the requested pieces from Oakley or Le Gros Clark appeared in the *Cahiers*, but even if these particular summary articles were never written, Hawkes was aware of their work and their arguments for Africa; Oakley even read selected sections of the entire text in draft and returned feedback and comments.[685]

When Hawkes and the International Commission for the Scientific and Cultural History of Mankind received commentaries from the UNESCO national commissions late in 1957, however, it became apparent that this foundational point about the cradle of humankind was a major point of contention, particularly for the delegation from the Soviet Union. On page 36 in

[683] D.A.E. Garrod, "The Relations Between South-West Asia and Europe in the Later Palaeolithic Age," *Cahiers d'histoire mondiale* 1, no. 1 (July 1, 1953), 13-37.
[684] See request list in Jacquetta Hawkes to Armando Cortesão, March 7, 1952. File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO.
[685] See the summary list of the published *Cahiers* pieces originally requested by Hawkes, April 1960 in SCHM 1/29, folder 2.83(1), UNESCO; see also Jacquetta Hawkes, interim progress report, November 16, 1955, File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO.

the complete draft, Hawkes had written: "There is now very little doubt that the continent which has the first claim to pre-eminence is Africa." Soviet ethnologist G.F. Debetz replied:

> It is possible, however, that the human species first emerged in Asia although it is difficult to insist on this because of the many points still obscure in this problem as a whole.[686]

He conceded that Africa was a popular hypothesis, but insisted on replacing the paragraph entirely, beginning with a new line: "The question of man's cradle land cannot be regarded as completely solved," and continuing:

> There is no doubt that Australia, America, and in all probability northern Eurasia must be excluded as possible zones. The remainder of the earth's land surface (southern Eurasia and Africa) is too vast to be considered as the cradle of the species since the emergence of man most certainly took place on a more restricted territory. At the present time, however, it is impossible to define the boundaries of this territory more exactly.[687]

Debetz conceded that "Many scholars favor Africa as the answer to this problem," since it was in Africa that the "most man-like" Australopithecines had been found. He strongly recommended, however, that the paragraph in the text be amended to conclude: "It is not impossible, however, that the cradle of man was one or another part of Southern Eurasia."

This was neither the first nor only time the Soviet UNESCO commission had intervened in the *Scientific and Cultural History*. The Soviet Union joined had only joined UNESCO in 1954, putting them at a practical and political disadvantage when trying to assert editorial control or political-historical prerogatives on the in-process text.[688] Alexandre A. Zvorikine, the chief

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[686] "Comments by G.F. Debetz (recommended by Prof. A.A. Zvorikine, member, International Commission for a History of the Scientific and Cultural Development of Mankind)." File 2.84(6), SCHM 1/38, UNESCO, pp. 4.
[687] "Comments by G.F. Debetz (recommended by Prof. A.A. Zvorikine, member, International Commission for a History of the Scientific and Cultural Development of Mankind)." File 2.84(6), SCHM 1/38, UNESCO, pp. 4.
[688] John A. Armstrong, "The Soviet Attitude Toward UNESCO," *International Organization* 8, no. 2 (May 1954), 217-233.

Soviet representative, immediately requested copies of the draft volume outlines and Hawkes' preliminary text, which he returned with comments.[689] The Soviet delegation reviewed all the preliminary plans for the volumes of the *Scientific and Cultural History*, and suggested many instances where the work of Soviet researchers could be productively integrated into the existing schema.[690] This was a prelude to the even lengthier comments that were returned to all the *Scientific and Cultural History* volume authors, not just Hawkes. Authors like Poul Duedahl and to a lesser extent Paul Betts have framed the famously lengthy and contrarian Soviet commentaries on the draft volumes of the *Scientific and Cultural History* as blatant obstructionism.[691] However, the objections raised on the topic of human evolution by reviewers representing the USSR and other socialist countries should not be dismissed out of hand. Rather than looking at the Soviet reviews as high-level international trolling, the content of the objections gives insight into where the cracks were in a scientific domain that was freighted with political significance.

The socialist challenge to Hawkes revolved around two main domains. The first concerned the construction of the hominin evolutionary lineage, which was assumed to be singular, monophyletic, and culminating in modern *Homo sapiens*. The second concerned the problem of determining or defining the boundary between "pre-human" and "human" in the first

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[689] Hawkes' responses to Zvorikine include: "The recommendations in this paragraph are entirely met by the text as now written," "This point has been partly met in the text as written, but the more extreme Soviet view should appear in a note," "I cannot find any substance in this suggestion," and "I cannot agree with these proposals." See Jacquetta Hawkes, "Comments on Professor Zvorikine's suggestions for Volume I, Part 1," February 20, 1956. File 2.83(1), SCHM 1/28, AG 8 Secretariat records, UNESCO.
[690] See A.A. Zvorikine, "Préface," *Cahiers d'histoire mondiale*, numéro spécial, Contributions à l'histoire russe (January 1958), 12-13.
[691] Paul Betts, "Humanity's New Heritage: UNESCO and the Rewriting of World History," *Past and Present* 228, no. 228 (August 2015), 249-285; and Poul Duedahl, "Selling Mankind: UNESCO and the Invention of Global History, 1945-1976," *Journal of World History* 22, no. 1 (March 2011), 101-133. Mark Mazower provides a helpful overview of the general Soviet strategy in the UN in his *Governing the World*, ch. 8 and 9.

place. The most common criticism was that Hawkes was insufficiently attentive to Marxist theories of human development, the doctrine of historical materialism, and the role of labor in the development of humanity.[692] Dr. Jiří Neustupný, one of the two authors of the comment submitted by Czechoslovakia, wrote, bluntly: "The author [Hawkes] does not seem to side frankly and intentionally with some of the basic conceptions of history."[693]

Debetz, Jiří Neustupný and Bohuslav Klíma, representing Czechoslovakia, and Konrad Jazdzewski, Maria Chmielewska, and Ludwik Sawicki, representing Poland, all focused on the question of anthropogenesis and the relationship between the Australopithecines, Pithecanthropoids, Neanderthals, and modern humans. Their primary argumentative strategy emphasized scientific uncertainty and expert dissent within the field, but their objections also aligned with Leninist conceptions of the stages in human evolutionary development. Purposeful tool-making behavior was the dividing line between pre-human and human. In a 1917 essay, Lenin differentiated the stages of human development as a progression from "a stick-wielding herd of monkeys," to "primitive men" who deliberately constructed tools, to "men united in clans," experiencing the beginning of social organization.[694] If human-ness was defined as progression to the second stage of development, then the Pithecanthropoid fossils known as *Sinanthropus pekinensis* (Peking Man), were the real first ancestors of modern humans. Those

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[692] The reference is to Engels's 1876 essay "The Part Played by Labor in the Transition from Ape to Human," although none of the reports invoke this source directly. For further discussion on socialism, paleoanthropology, and the People's Republic of China, see Sigrid Schmalzer, *The People's Peking Man: Popular Science and Human Identity in Twentieth Century China* (Chicago: University of Chicago Press, 2008).

[693] Jiří Neustupný, "Comment by the Members of the Czechoslovakian National Commission of UNESCO." File 2.84(6), SCHM 1/38, UNESCO, pp. 1.

[694] V.I. Lenin, "The State and Revolution: The Marxist Theory of the State and the Tasks of the Proletariat in the Revolution," in Stepan Apresyan and Jim Riordan, eds., *V.I. Lenin, Collected Works*, vol. 25 (June-September 1917) (Moscow: Progress Publishers, 1974), 395. On this point, see also Gustav A. Wetter, *Dialectical Materialism: A Historical and Systematic Survey of Philosophy in the Soviet Union*, trans. Peter Heath (London: Routledge and Kegan Paul, 1958), 469-473.

fossils, unearthed outside Beijing, had been found in association with an array of worked stone and antler tools. The Australopithecines discovered in South Africa retreated in importance. Robert Broom and Raymond Dart's fossils became simply compellingly strange examples of fossil apes that were not human, because they apparently had not made tools. From this perspective, it was once again now arguable that 'humanity' really did emerge first in Asia, and the African origins hypothesis appeared somewhat less justified, at least in the form that Hawkes presented.

Other than the Czechoslovak, Polish, and Soviet delegations, only two other reviewers made even cursory notes on the existence of other possible hypotheses about the geographic orientation of the cradle of humankind. Professor Alberto Carlo Blanc, representing Italy, suggested that Hawkes should hedge her claims a little more: it struck him as preemptory to declare that Africa was accepted unanimously as the site of the ancient human homeland, when this was, in his view, far from the case.[695] From the ten scholarly reviewers, only one, Luis Pericot Garcia at the University of Barcelona flagged the same claim by Hawkes, writing simply that "It is doubtful that Africa was the cradle of Homo sapiens," with no further comments.[696]

It was not strictly true that no tools had been found in Africa in association with hominin fossils; as described earlier in the chapter, Kenneth Oakley and Clarence van Riet Lowe had discovered very simple stone tools in gravels that appeared to be the same geological age as *Australopithecus*. Oakley had written about "Man the Tool-Maker" as early as 1943, when he

[695] Prof. Alberto Carlo Blanc, directeur de l' Instituto di Paletnologia Città Universitaria, Rome (au nom de la Commission Nationale Italienne pour l'Unesco). File 2.84(6), SCHM 1/38, UNESCO, p. 3.
[696] Luis Pericot Garcia, Professeur de Préhistoire à la Faculté de Philosophie et Lettres de Barcelone: "Page 107 – Il est plus que douteux que l'Afrique soit le berceau de l'Homo sapiens." File 2.84(6), SCHM 1/38, UNESCO, p. 3.

argued that "The employment of tools is undoubtedly a fundamental characteristic of man."[697] "As with all biological classifications," he continued, "only an arbitrary line can be drawn between pre-human and human," but if "man as tool-making animal" was taken as the definition, then, Oakley pointed out, the difficult-to-answer question "When did man first appear?" transformed into "When do we see the earliest tools?"[698] In 1957, the same year Hawkes finished her draft, Raymond Dart published a short monographic account of his research into the "osteodontokeratic" culture of *Australopithecus prometheus*, where he argued that his famous man-apes, in addition to being important precursors to the hominin line, had also invented fire, culture, and tools made of bones, teeth, and horn (*osteo-donto-keratic*).[699] Oakley also followed up with this line of questioning in 1957, when he published "Tools Makyth Man" in the January issue of the British journal *Antiquity*.[700] There was extensive evidence for stone tool industries all over eastern, central, and southern Africa, although there was no direct proof linking these tools to any of the fossil hominins that had been found in the same region. The non-socialist paleoanthropological consensus, in broad terms, agreed that tools were valuable for demarcating a boundary condition but they were not the be-all, end-all for defining human-ness and placing humanity's geographic origins.

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[697] K.P. Oakley, "Man the Tool-Maker," *Proceedings of the Geologists' Association* 55, no. 2 (1944), 115-118. This was expanded into an 98-page monograph in 1954: see K.P. Oakley,

[698] Oakley, "Man the Tool-Maker," 115. Oakley differentiated between animals using found objects to attain goals and purposeful tool-making, behavior he ascribed only to humans. In the early 1960s, Jane Goodall would observe chimpanzees in Gombe performing exactly this kind of purposive tool construction, stripping and cleaning a twig to stick into a termite mound for a snack, meaning this definition of "human" no longer held.

[699] Raymond Dart, *The Osteodontokeratic Culture of Australopithecus Prometheus*, Transvaal Museum Memoir No. 10 (Pretoria: The Transvaal Museum, 1957). Dart's claims on the osteodontokeratic were not at all popular, nor were they taken particularly seriously; see Marshall T. Newman, review of Raymond Dart (with Dennis Craig), *Adventures with the Missing Link*, in *Science* 131, no. 3400 (February 26, 1960), 603; and Robin Derricourt, "The Enigma of Raymond Dart," *The International Journal of African Historical Studies* 42, no. 2 (2009), 257-282.

[700] Kenneth Oakley, "Tools Makyth Man," *Antiquity* 31 (January 1, 1957), 199-209. The archaic spelling was deliberate.

After discussion between Hawkes and the series editors, the Soviet objections were published as footnotes appended to the conclusion of each chapter.[701] The solution was not fully acceptable to the Soviet national commission, which proposed further alterations, but in the final stages of editing on the text of volume one, it was determined that the Soviet additions could not be fully implemented. One UNESCO official noted in an internal memo that while the last-minute complaints from the Soviet prehistorians seemed a little contestable from the scientific point of view, they presented a certain interest from the ideological point of view, and added necessary color and depth to the history of humankind in the making. For her part, Jacquetta Hawkes thought that she had sufficiently illustrated the main points of Marxist thought on certain aspects of prehistoric society.[702] Eventually, though, the edits were stopped: H.G. Bandi, a Swiss professor of archaeology, selected as the neutral final reviewer, decided that the requests for additional notes would no longer be tolerated, as they were not useful to either reader comprehension or the intellectual merits of the *Scientific and Cultural History*. Volume one of the *History of Mankind* went to press and was published in English in 1963, followed by a French edition in 1967. Spanish, Greek, Slovenian, and Serbo-Croat translations were ultimately produced, although the short list of languages makes it clear that the grand ambitions of the International Commission to produce an authoritative world history that would be found in classrooms and libraries around the world had not quite come to fruition.[703]

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[701] Guy Métraux to H.C. Bandi, 27 April 1961. SCHM 1.36, UNESCO.
[702] Guy S. Métraux to P.E. de Berrêdo Carneiro, SCH/Memo No. 989, 25 April, 1961. SCHM 1.36, UNESCO.
[703] The one exception may have been Yugoslavia—although I have no evidence on whether the *Scientific and Cultural History* was integrated into a national curriculum, Yugoslavia was a major UNESCO project site in the 1960s, when it was viewed as a meeting point for socialist and non-socialist Europe. In this context, it's easier to imagine how the original enthusiasm for this historical project might have lingered longer and motivated UNESCO (or the Yugoslav national commission) to produce Slovenian and Serbo-Croat translations. On Yugoslavia and UNESCO in the 1960s, see Chloé Maurel, "UNESCO and Western Europe: From Cold War to Détente," in Lorenzo Mechi, Guia Migani, and Francesco Petrini, eds.

The Soviet critiques were leveled against Hawkes' interpretation of the evidence. It's difficult to read the Soviet delegation's growing volume of complaints and requests for clarification (and changes to the formatting, and different copy-editing practices, and better Marxist theory) without seeing in them a larger pattern of political obstructionism and attempts to assert power in an international arena by opposing American, British, and French interests in the small-scale of the International Commission for the Scientific and Cultural History of Mankind, which was heavily dominated by functionaries from those three countries.[704] But Debetz and Zvorikine's choice of emphasis was not random—their critique and its similarity to issues in circulation in the non-socialist paleoanthropological community makes clear how much the answers to the question "where" and "under what conditions" relied on how the evidence from the evolutionary record was interpreted. The explicit internationalist approach that UNESCO and the International Commission had championed for the project also meant that these different perspectives were supposed to be taken seriously. Weighing evidence differently could produce different valid answers, even as radiometric dating put the entire world on one common temporal scale.

When the first volume of the *Scientific and Cultural History* was released in 1963, it was the subject of a cover story in UNESCO's monthly magazine, *The UNESCO Courier*.[705] The mood was decidedly ambivalent, the triumph of publication notwithstanding. Ralph Turner had

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Networks of Global Governance: International Organizations and European Integration in a Historical Perspective (Newcastle upon Tyne: Cambridge Scholars Publishing, 2014), 105.

[704] Mark Mazower has also pointed out that this kind of oppositional delaying tactic was a common Soviet practice in the UN in the late 1950s; see Mazower, *Governing the World*, 244-249.

[705] Guy Métraux, "History of Mankind: A Global View of Scientific and Cultural Development," *The UNESCO Courier* 16, no. 6 (June 1963), 5. In contrast to the *Scientific and Cultural History*, the *Courier* was published in nine international editions: English, French, Spanish, Russian, German, Arabic, American English, Japanese, and Italian. (As a lightweight monthly magazine, however, the *Courier* was significantly less expensive to produce.)

been removed as editor-in-chief after he suffered two heart attacks in 1959, partially brought on by the stress of attempting to bring the project to fruition.[706] It was also clear the UNESCO history project was making little progress on the front of increasing international understanding and cooperation. "Many of the differences that still divide mankind go back far into the distant past," wrote Guy Métraux in the *Courier*. If the problems of international collaboration and the divisions between peoples, nations, and worldviews couldn't be ironed out within the confines of a small academic commission, then the prospects of UNESCO's other projects for international understanding looked dim in the larger world. "Yet," Métraux continued,

> …as Professor Paulo E. de Berredo Carneiro, of Brazil, points out in the preface to the *History*, a study of the historical antecedents of its peoples reveals links which draw them nearer to one another.[707]

Even if unity and peace among peoples was a work-in-progress, Métraux saw the work of the *Scientific and Cultural History* as connecting the ends of a circle. From a primordial unity, humankind had emerged. Now, at the mid-point of the twentieth century, humankind was staggering back towards "a growing consciousness of a civilization embracing all mankind"—one internecine, pettifogging, contradictory footnote at a time.[708]

Conclusion

The 1950s saw new political arrangements and new technological developments that made exploring the deep history of the human species—a truly global-scale problem—feasible in an entirely new way. Bringing the *Scientific and Cultural History of Mankind* to fruition and producing a world-wide accounting of absolute radiocarbon dates required active international

[706] Duedahl, "Selling World History," 126-127.
[707] Métraux, "History of Mankind," 5.
[708] Métraux, "History of Mankind," 7.

cooperation, from the level of gathering samples from specific remote parts of the world and getting them safely back to a radiocarbon lab in the United States to the level of orchestrating a massive multi-country review of a series of 800-plus page documents. Solving a world-wide problem could be possible if the world's scientists were mobilized towards the same goal.

These projects were co-constituted with the international networks that sustained them, but this internationalism was not friction-less and ran along lines of historical relationships; they were international in the literal sense, in that most of the action took place between nations, or individuals representing their nation in a small venue, but not in the emergent figurative inclusive sense, which recognized a much larger body of nations (many of which came into being during the 1950s, or the early 1960s). In fact, both radiocarbon and the *Scientific and Cultural History* could more accurately be described as inter-imperial instead of inter-national projects, given the imperial nation-states that were involved and how their positions in the postwar international power structure facilitated these projects. Both groups also had to navigate a complex and changing international geopolitical landscape to accomplish the work at hand.

Both the radiocarbon project and the *Scientific and Cultural History* were full of paradoxes and contradictions. The UNESCO history was predicated on the unity of *Homo sapiens* and a shared paleoanthropological heritage—but it proved difficult to reach consensus on what defined *Homo sapiens*, or what should be included in the accounting of the planet's prehistoric patrimony. UNESCO was a part of a new political framework of "world-civilization"—but one that included "non-self-governed territories" who had no voice in the proceedings for the first decade of the organization's activities.

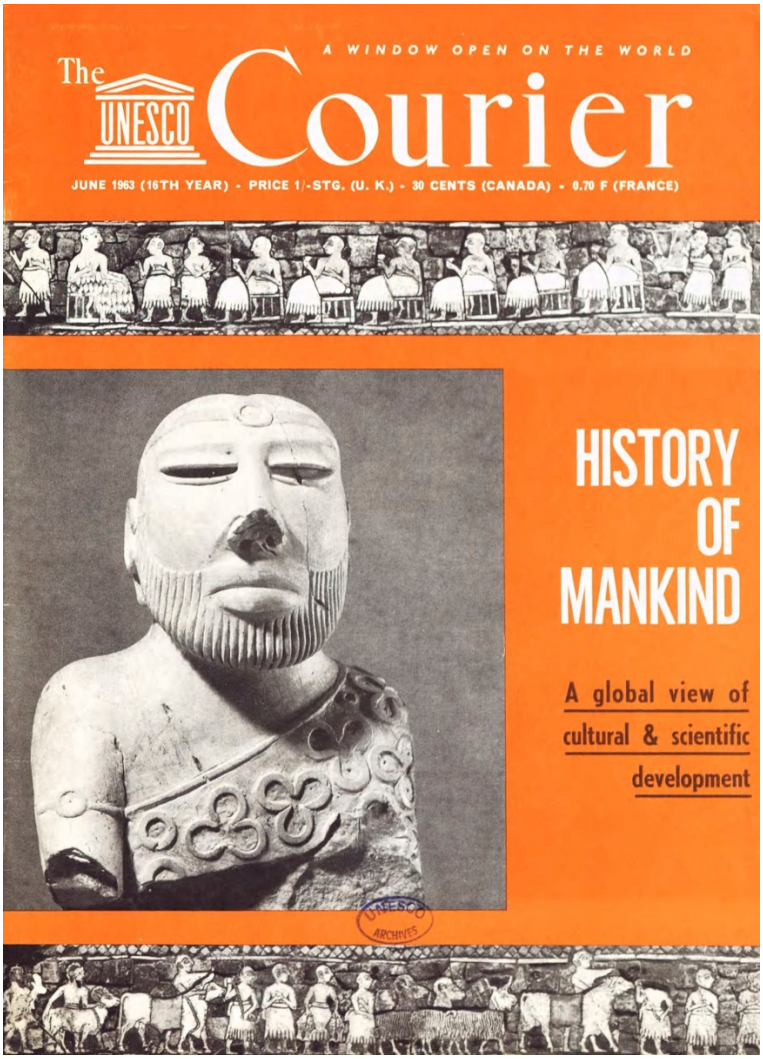


Figure 18 Cover image, *The UNESCO Courier* 16, no. 6 (June 1963).

Radiocarbon and fluorine dating provided incredible new insights into the absolute and relative ages of artifacts and natural events around the world—but only within certain time limits, and the advancing global nuclear programs made those absolute dates more difficult to calculate and verify. These projects showcased new models of scientific collaboration—but followed collaborative networks that extended along partial and incomplete pathways created and contorted by the power gradients of the global Cold War.

Chapter 5. TELLING STORIES

AFRICAN HISTORY AND THE CRADLE OF MAN

If 1959 was the Year of Darwin, 1960 was the Year of Africa. Seventeen new nations became independent in what had been French West Africa in a single year, and many more followed in the subsequent decade. In 1950, a map of the continent showed only four sovereign nations; by 1967, the number had risen to thirty-nine.[709] Colonial-era studies of Africa had reinforced the idea that Africa *had* no history, prior to European imperial control, and that the continent had simply existed in a primordial state of nature.

In his 1947 work *The World and Africa: An Inquiry into the Part which Africa Has Played in World History*, W.E.B. Du Bois asked "Was Africa the cradle of the human race? Did it witness man's first evolution from anthropoid ape to *Homo sapiens*?"[710] Du Bois concluded that the answer was yet unknown, quoting Darwin and Grafton Eliot Smith venturing cautious support for the idea of an African origin, but also conceding that it was entirely possible that humanity had begun in Asia and migrated into Africa, or even in Europe, becoming "Negroid by long segregation in a tropical climate."[711] Du Bois continued:

> But all this is conjecture. Of the origin of the Negro race or of other human races, we know nothing. But we do know that human beings inhabited Africa during the Pleistocene period, which may have been half a million years ago.[712]

Du Bois referred to the evidence of the Ugandan pebble-tools, describing them as the most primitive type of stone implement yet found, and then noted the succession of other stone tool

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[709] "New Portrait of Africa's Changing Face," *National Geographic Magazine* 118, no. 3 (September 1960), 360, and "Africa 1967," *The UNESCO Courier* 20, no. 6 (June 1967), 21. The four sovereign nations in 1950 were Egypt, Liberia, Ethiopia, and the Union of South Africa.
[710] W.E.B. du Bois, *The World and Africa: An Inquiry into the Part which Africa Has Played in World History* (New York: The Viking Press, 1947), 86.
[711] Du Bois, 86.
[712] Du Bois, 86.

cultures that had been found throughout the African continent. These included the "superb hand-axes" discovered in North Africa, the Sahara, Central Africa, West Africa, and South Africa, and the "middle Paleolithic flake-tool culture," which was best represented by implements unearthed in South Africa.[713] Du Bois' point was that Africa could not be discounted or denied a presence in world history; even at the earliest period of human cultural production, the archaeological record could be used to establish developmental commensurability between Europe and Africa. Du Bois cautioned the reader against adhering too strictly to the continental-scale approach to African history, emphasizing Africa was full of infinitely varied cultures and peoples, with distinct histories, and that there was thus "no one African race and no one Negro type."[714] He reiterated: "Africa has as great a physical and cultural variety as Europe or Asia." The point was that at no time in history had Africa been a continent without a history, any more so than Europe.

Du Bois was a titanic figure in anti-imperialist, anti-racist, and pan-African movements world-wide, and *The World and Africa* was written with these aims in mind. As a movement, Pan-Africanism had many pressing and significant goals, particularly the complete liberation of the continent from European rule, although the term is also an umbrella category for a variety of sometimes allied, sometimes contradictory political and cultural movements.[715] Nevertheless,

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[713] Du Bois, 89. Du Bois' exact sources for this discussion remain uncertain, although the pebble-tools of Uganda are clearly those described in detail by Wayland (1934). In a short bibliographic note in the introduction to *The World and Africa*, his sources for chapter IV (from which these excerpts are taken) are stated to be Edwin W. Smith (a missionary and anthropologist who also served as editor of *Africa*), Julian Huxley, and anthropologist C.G. Seligmann, "whose *Races of Africa* (1930) is priceless and marred only by his obsession with the 'Hamites.'" (Du Bois, ix)

[714] Du Bois, 97.

[715] The complete end of colonial rule in Africa was possibly the only touchstone for all the disparate groups affiliated with the movement; see Samuel W. Allen, "Introduction," in American Society of African Culture, ed., *Pan-Africanism Reconsidered* (Berkeley: University of California Press, 1962), 13. On Pan-Africanism broadly, see Colin Legum, *Pan-Africanism: A Short Political Guide*, rev. edition (New York: Frederick A. Praeger, 1965); Adekunle Ajala, *Pan-Africanism: Evolution, Progress, and Prospects* (London: André Deutsch Ltd., 1973); and Hakim Adi and Marika Sherwood, *The 1945 Manchester Pan-African Congress Revisited* (London: New Beacon Books, 1995).

speaking about Africa's position as the cradle of humanity was a powerful political point that supported claims for African historicity and the right to self-determination. As a child growing up in Panama in the 1950s, UNESCO regional director Simon A. Clarke recalled learning in the Universal Negro Improvement League Juvenile Division about Africa's importance as the "very cradle of humanity itself, a continent from which all other races had their origins."[716] This was in addition to the continent's enormous mineral wealth and rich cultural heritage, which seemed to augur a strong and powerful future for the continent that had played such an important role in humanity's ancient past. When Africa's history could be described on a timescale of one million years, the European colonial period appeared as a localized anomaly, rather than the defining historical experience of the African continent—especially as the process of imperial unraveling accelerated in the 1950s.

This chapter traces the disappearance of the Asian origins hypothesis in expert and popular discourse, from the end of World War II to the late 1960s. During this period, scientific studies of race and racial prejudice decoupled race from concepts of language and culture. While the race concept persisted (sometimes with astonishing tenacity), race could now only be defined with reference to biological characteristics, rather than cultural identity. This erased one of the major historical supports for the Asian origins hypothesis. With physical fossil evidence now cast as the main category of admissible data in human evolution studies—and in light of the continuing string of spectacular fossil finds produced by the Leakey teams in East Africa—understanding why the Asian hypothesis had ever been taken seriously became much more difficult. Likewise, as the profile of African paleoanthropology rose, researchers like Leakey and Dart embraced opportunities to narrate their work to governments, funding agencies, and the

[716] Simon A. Clarke, "Understanding Pan-Africanism," *Caribbean Quarterly: A Journal of Caribbean Culture* 58, no. 1 (2012), 101.

public. While these paleoanthropologists often made passing reference to previous scientific doctrine on human origins, their focus was, understandably, on themselves. Through their speeches, television and film appearances, and journalism, Dart and Leakey shaped public perceptions of the science of African origins, framing themselves as the modern inheritors of Darwin's prophetic statement that Africa was the cradle of humankind.

It was not just that the paleoanthropological literature left Asian origins behind, but the expansive Africanist historiography did too. With independence, scholars in African universities as well as in Europe and North America began to publish new histories of the African continent.[717] Africa was not only important to the globe because of the ferment of decolonization and the radical reshaping of the regional political maps; it had always been important, fundamentally, to the history of the entire human race. For authors of new African histories who wanted to situate their subject in the *longue durée*, the emergence of *Homo sapiens* in Africa was a superb anchor point, and one that allowed these authors to counter the old historiography of global irrelevance. Humanity's African origins were picked up in discourses of independence, decolonization, Pan-Africanism, and civil rights, and referenced in hundreds of new books on African history. In this context, the theory became packaged as objective fact, disconnected from its intellectual history, and the Asian origins hypothesis vanished into the past.

The science writer Robert Ardrey began his 1961 book *African Genesis* with the arresting line: "Not in innocence, and not in Asia, was mankind born."[718] By the end of the decade, it might have been unnecessary to include the second phrase.

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[717] See Ebiegberi Joe Alagoa, *The Practice of Historiography in Africa: A History of African Historiography* (Port Harcourt, Nigeria: Onyoma Research Publications, 2006), and Christopher Fyfe, ed. *African Studies since 1945: A Tribute to Basil Davidson* (London: Longman, 1976).
[718] Robert Ardrey, *African Genesis: A Personal Investigation into the Animal Origins and Nature of Man* (New York: Antheneum, 1963), 9.

Race and the Cradle of Man

During and after World War II, many anthropologists and biologists, especially in the United States, were actively engaged in repudiating major claims of Nazi racial science, including the existence of an "Aryan race."[719] This did not mean that anthropologists or biologists claimed that racial categories did not exist, but it did lead to a localization of race in physical characteristics and an explicit rejection of the nineteenth century idea that race and language could be collapsed into one another. Theodosius Dobzhansky and L.C. Dunn referenced Max Müller in their book *Heredity, Race, and Society*, first published in 1946, describing him as a "good scientist…who on an unlucky day used the words 'Aryan race' to describe peoples who spoke a certain group of languages."[720]

The scientific wrangling with the meaning and scientific value of race that took place during and after the end of World War II was only indirectly related to the change in paleoanthropological perspective on the importance of Africa. When arguments and new ideas about race were relevant, it was largely because these reformulations of the nature and meaning of race further weakened the supporting evidence for the Asian origins hypothesis that had first been proposed in the nineteenth century. Thinking about Africa as a part of human universal history required jettisoning multiple centuries of cultural baggage, including a long inheritance of racist thought and writing; but it did not depend on a wholesale rejection of the race concept.

For example, in *Race: Science and Politics*, originally written in 1939, anthropologist Ruth Benedict began by setting out a firm definition of what race was and what it was not. "In

[719] See Tracy Teslow, *Constructing Race: The Science of Bodies and Cultures in American Anthropology* (New York: Cambridge University Press, 2014), especially ch. 6.
[720] Theodosius Dobzhansky and L.C. Dunn, *Heredity, Race, and Society*, rev. ed. (New York: New American Library of World Literature, Inc., 1954), 13.

the briefest possible definition," she wrote, "race is a classification based on traits which are hereditary."[721] External, visible, physical characteristics like skin color, facial structure, hair type and color, and blood type were all potential signifiers of racial identity, but cultural and social behaviors and traits were not. "In the first place," she wrote,

> race and language are not the same. This should be obvious, for not all who speak Arabic are Arabians and not all who speak English are of the White race. Nevertheless this confusion occurs constantly.[722]

While there were instances where people who were all the same race also all spoke the same language, or where a language was exclusively spoken by people who belonged to a specific racial group, Benedict emphasized that this was always due to a third exogenous factor, group isolation. Especially in a more sparsely populated globe at an earlier time in human history, it was entirely possible that a group could become geographically and reproductively isolated from other human groups; historically, though, this isolation broke down before too many generations had passed, leading to racially intermixed populations that spoke one or the other language.[723] Benedict's primary purpose in reinforcing this language-race discontinuity was to point out the fundamental falseness of the concept of the "Aryan race." It was only a term for classifying a group of languages, with no reference to a "peculiar German racial heritage:"

> Because of the ludicrous inapplicability of the first sense of the word *Aryan*, the Nazis, when they selected the term, were obviously thinking of it in the latter sense of *Indo-*

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[721] Ruth Benedict, *Race: Science and Politics*, new edition with a foreword by Margaret Mead (New York: The Viking Press, 1959), 9. Trained by Franz Boas, Benedict was best known for her 1946 work, *The Chrysanthemum and the Sword*, which emerged from Benedict's wartime work with the Office of War Information (OWI) on Japanese culture and the Japanese "national personality." On Benedict and her fellow Boasians, see William Y. Adams, *The Boasians: Founding Fathers and Mothers of American Anthropology* (Lanham, MD: Hamilton Books, 2016).

[722] Benedict, *Race: Science and Politics*, 9.

[723] Benedict, *Race: Science and Politics*, 10. Or a language that combined features of both precursor languages.

> *European*. But the people speaking Indo-European languages have no unity of racial type either in skin, in eye or hair color, in cephalic index or in stature.[724]

Benedict made many of these same points in a short pamphlet for American servicemen (and the broader US public) that she co-wrote with anthropologist Gene Weltfish in 1943. In *The Races of Mankind*, Benedict and Weltfish made the stakes of their project obvious: "Thirty-five nations are now united in a common cause – victory over Axis aggression, the military destruction of fascism."[725] Racial understanding was critical to victory in the war, requiring coordination and cooperation between "the most different physical types of men," with "the most unlike beliefs, the most varied ways of life."[726] Racial difference still existed, but Benedict and Weltfish emphasized that there were no valid reasons for treating people of other races unfairly or as if they were inferior—and in any event, winning the war simply wouldn't be possible without interracial cooperation.[727]

Benedict was not writing with the goal of educating her readers about the ongoing debates over where and how the human species had evolved; Benedict focused on what race was and was not, and any collision with existing discourses on the geography of human origins was either indirect or incidental. In their 1943 *The Races of Mankind*, Benedict and Weltfish wrote:

> The greatest adventure story in the history of the world is the spread of early man to all corners of the globe. With crude tools, without agriculture, without domesticated animals

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[724] Benedict, *Race: Science and Politics*, 11.
[725] Ruth Benedict and Gene Weltfish, "The Races of Mankind" (1943), reprinted in Ruth Benedict, *Race: Science and Politics*, new edition with a foreword by Margaret Mead (New York: The Viking Press, 1959), 169.
[726] Benedict and Weltfish, "The Races of Mankind," 169. The reader was assumed to be a white US serviceman, and there is some slippage between the categories "white" and "American."
[727] See Teslow, ch 6. See also John P. Jackson, *Social Scientists for Social Justice: Making the Case Against Segregation* (New York: NYU Press, 2001), ch 2; and Anthony Q. Hazard, Jr., *Postwar Anti-Racism: The United States, UNESCO, and "Race," 1945-1968* (New York: Palgrave Macmillan, 2012), ch 1.

> except the dog, he pressed on, from somewhere in Asia, to the tip of Africa, to the British Isles, across the Bering Strait into America and down to Cape Horn.[728]

This was, as of 1943, the mainstream scientific narrative. Neither Benedict nor Weltfish was particularly versed in Old World prehistory or paleoanthropology; both women were cultural anthropologists who primarily worked on North America, although Benedict also studied Japan. Their closest point of contact with the cutting edge of paleoanthropology was most likely Franz Weidenreich, ensconced some thirty Manhattan blocks to the south at the American Museum of Natural History with his casts of *Sinanthropus pekinensis*, and surrounded by the fossils of vertebrate mammals and dinosaurs discovered by the Central Asiatic Expeditions. "Somewhere in Asia" was the generally accepted hypothesis for the geographic locus of human origins at that time.

The Races of Mankind was later adapted into a cartoon film strip and then an illustrated children's book, titled *In Henry's Backyard*.[729] When the book was released in 1948, it still marked the origin point of the human species as being in Asia, or at least located the dispersal point of the three major races somewhere in central Eurasia. It also described these early humans as having an indeterminate tan skin color, which had then become darker or lighter when human populations became geographically isolated in extreme climates at the far ends of the continents. "At the outer edges of the world," read the picture book page, "the extremes of skin color developed—what we call the black, the white, and the yellow skin colors."[730] It continued: "But scientists know that skin-color doesn't really matter; that you can't classify or judge people by

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[728] Ruth Benedict and Gene Weltfish, "The Races of Mankind" (1943), reprinted in Ruth Benedict, *Race: Science and Politics*, new edition with a foreword by Margaret Mead (New York: The Viking Press, 1959), 172.
[729] Teslow, 265-282.
[730] Ruth Benedict and Gene Weltfish, *In Henry's Backyard: The Races of Mankind* (New York: Henry Schuman, Inc., 1948), 27.

their complexions." This was the same logic that had served the cause of nineteenth century monogenists: pick a central point of dispersion, count the indigenous peoples of the Americas as Asian for racial categorization purposes, and therefore prove that all the races could have a common ancestor, with their marked physical divergences being the result of prolonged exposure to very different environments. Skin color shouldn't matter for human relationships, Benedict and other authors were saying, but it was an entirely valid marker of race as a physical category.

This attentiveness to unpacking and delegitimizing the bases of Nazi racial science had the side effect of destabilizing any arguments that relied ideas about Aryan origins to explain why the cradle of humankind should be found in Asia rather than anywhere else on the planet. However, the number of people making those claims was relatively small, especially if enthusiastic supporters of the Third Reich were excluded from the sample. Henry Fairfield Osborn of the American Museum of Natural History, for example, was arguing for the Aryan relationships of his long-sought Central Asian Dawn Men into the 1930s, but after his death in 1935, there were few other supporters of his ideas in the American paleontological mainstream.

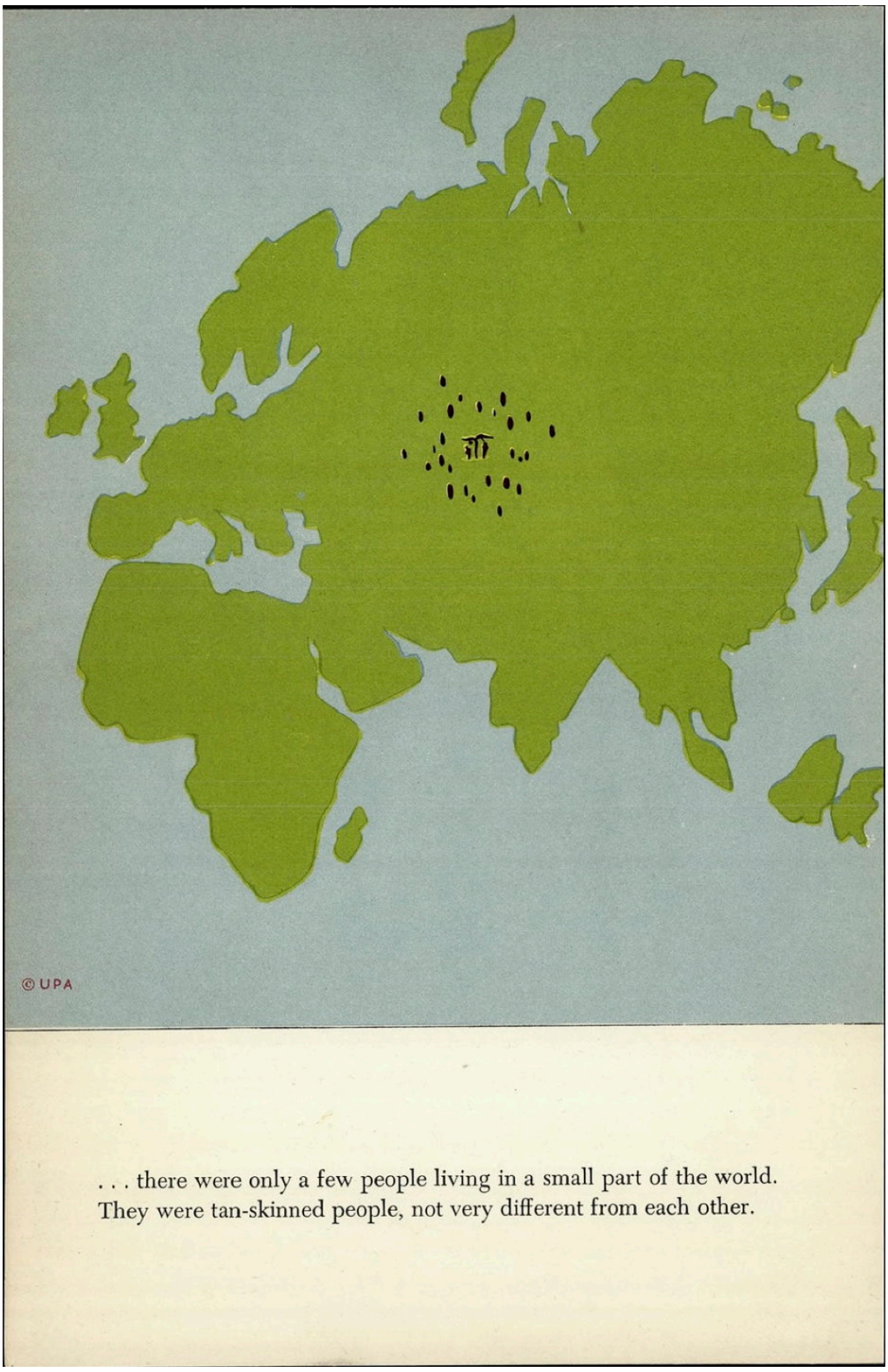


Figure 19 Ruth Benedict and Gene Weltfish, *In Henry's Backyard: The Races of Mankind* (New York: Henry Schuman, Inc., 1948), 25.

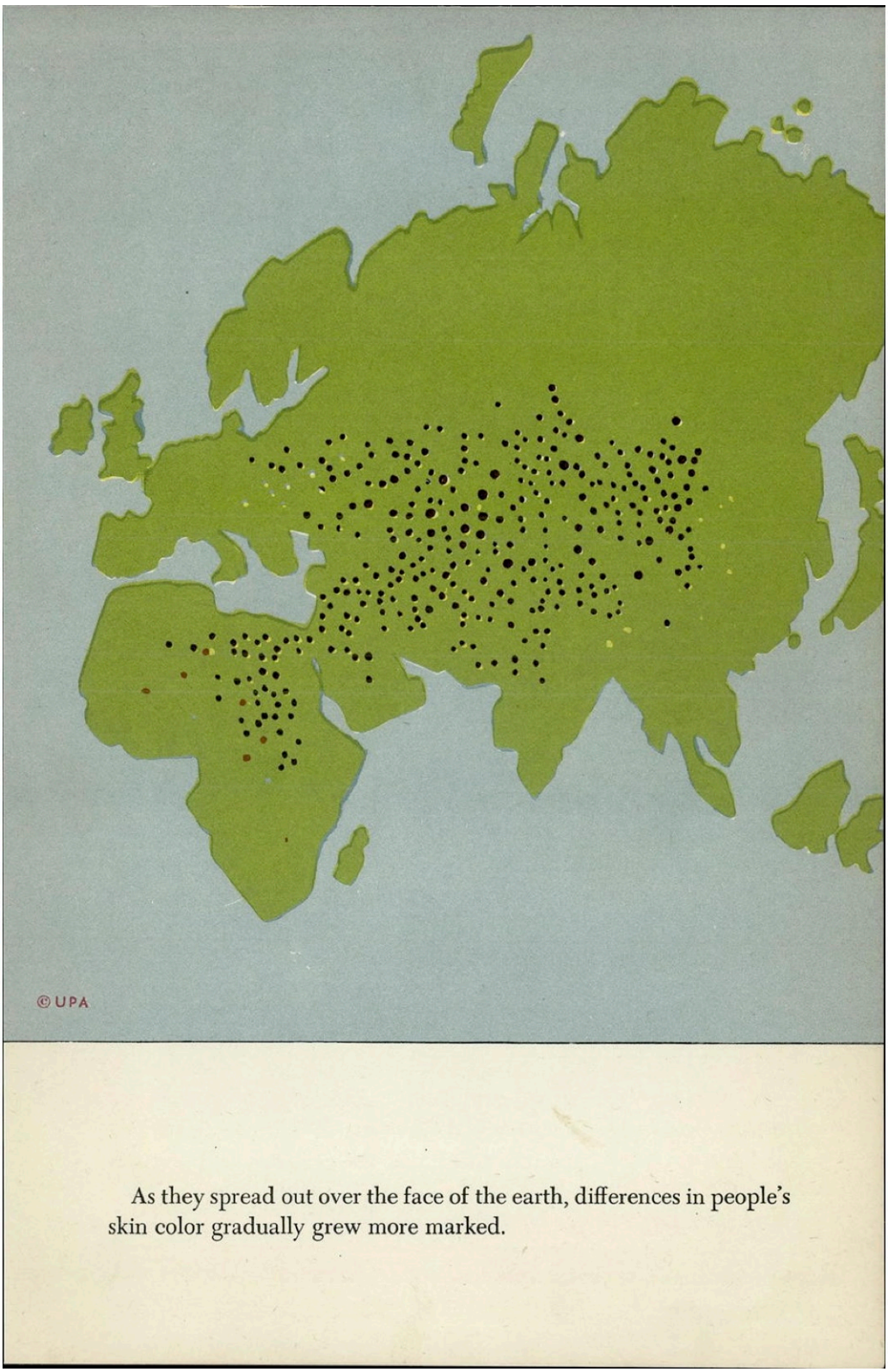


Figure 20 Ruth Benedict and Gene Weltfish, *In Henry's Backyard: The Races of Mankind* (New York: Henry Schuman, Inc., 1948), 26.



At the outer edges of the world the extremes of skin color developed —what we call the black, the white, and the yellow skin colors. But scientists know that skin-color doesn't really matter; that you can't classify or judge people by their complexions.

Figure 21 Ruth Benedict and Gene Weltfish, *In Henry's Backyard: The Races of Mankind* (New York: Henry Schuman, Inc., 1948), 27.

However, this does partly explain why the longer nineteenth century history of the Asian origins hypothesis largely fell out of scientific memory after the middle of the twentieth century. The racial and language theories buttressed the fossil evidence from Asia through the 1930s, and the combination of the two together could counter-balance the growing—although still small until the late 1930s—body of African evidence, which also suffered from the low credibility and high marginality of its discoverers. In the late 1940s, though, the balance decisively tipped towards Africa, due to the combination of geological, paleontological, and archaeological evidence already discussed, but also because the race-language theory was removed from the Asian side of the balance.

There is an extensive literature on the postwar reconsideration of race by anthropologists and biologists on both sides of the Atlantic, focusing especially on the UNESCO Statements on Race that were developed in serial iterations between 1949 and 1951.[731] Despite the apparent synchrony of the development of the race statements and the emergence of the out of Africa hypothesis, the two were not actually closely linked in 1950. The temporal specificity is important here—scientific thinking on race and African origins shifted in small but perceptible ways over the 1950s and 1960s.[732] The Statements on Race—which were heavily contested and

[731] See, for example, Jenny Reardon, *Race to the Finish: Identity and Governance in an Age of Genomics* (Princeton: Princeton University Press, 2005); Tracy Teslow, *Constructing Race: The Science of Bodies and Cultures in American Anthropology* (New York: Cambridge University Press, 2014); Michelle Brattain, "Race, Racism, and Antiracism: UNESCO and the Politics of Presenting Science to the Postwar Public," *The American Historical Review* 112, no. 5 (December 2007), 1386-1413; Perrin Selcer, "Beyond the Cephalic Index: Negotiating Politics to Produce UNESCO's Scientific Statements on Race," *Current Anthropology* 53, no. S5, The Biological Anthropology of Living Human Populations: World Histories, National Styles, and International Networks (April 2012), S173-S184; 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; and Anthony Q. Hazard, Jr., *Postwar Anti-Racism: The United States, UNESCO, and "Race," 1945-1968* (New York: Palgrave Macmillan, 2012).

[732] In short: the general sense of the secondary literature on paleoanthropology and race at mid-century is that the out of Africa hypothesis meaningfully coincided with the scientific reassessment of race, with positive effects for the project of liberal anti-racism, but with negative effects for paleoanthropology, which was restricted from acknowledging the possibility that multiple hominin species might have existed

revised and re-released with the comments of physical anthropologists who disagreed with the original version produced largely by cultural anthropologists—did not mean that Africa was more or less plausible as a candidate continent for the cradle of humanity.[733] In fact, as Perrin Selcer describes, talking specifically about race and Africa, or the treatment of Black citizens in white-majority nations, were especially circumscribed in the UNESCO discussions, lest United States or Great Britain—key UN members and sources of financial support—come under fire for their own domestic and imperial racial politics.[734]

In the first UNESCO race statement, written by a selection of social scientists and published in July 1950, points five and six (out of fifteen total) both rejected the idea that a linguistic group could be treated as a "race."[735] "To most people," ran point 5, "a race is any group of people whom they choose to describe as a race."

> Thus, many national, religious, geographic, linguistic, or cultural groups have, in such loose usage, been called "race," when obviously Americans are not a race…nor are any other national group. Catholics, Protestants, Moslems, and Jews are not races, nor are groups who speak English or any other language thereby definable as a race…[736]

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at the same time. While my thought on this period has been shaped by the work of Donna Haraway and Robert Proctor on the three-fold relationship between fossil hominin and primate studies, race theories, and the UNESCO race statements, both authors (in their very different ways) end up flattening significant shifts in scientific thinking about human evolution between the 1950s and the 1970s. See Donna Haraway, "Remodeling the Human Way of Life: Sherwood Washburn and the New Physical Anthropology, 1950-1980," in *Primate Visions: Gender, Race, and Nature in the World of Modern Science* (New York: Routledge, 1989), 186-230, and Robert N. Proctor, "Three Roots of Human Recency: Molecular Anthropology, the Refigured Acheulean, and the UNESCO Response to Auschwitz," *Current Anthropology* 44, no. 2 (April 2003), 213-239.

[733] The line "Under our skin, we are all Africans" is a classic example of how the out of Africa hypothesis was deployed as an anti-racist argument in the 1980s and 1990s, but this statement would have seemed like nonsense to the anthropologists and biologists who gathered at Cold Spring Harbor in 1950; the white audience members would have classified themselves as obviously not "Africans," if "African" was meant as a stand-in for a racial or ethnic classification. (The "under our skin" quote comes from Chris Stringer and Robin McKie, *African Exodus: The Origins of Modern Humanity* (New York: Henry Holt & Co., 1996).)

[734] As Selcer very nicely puts it, "The great advantage of the Holocaust as a foil for antiracists was that denouncing the Nazis alienated no member states." See Selcer, "Beyond the Cephalic Index," S175.

[735] United Nations Educational, Scientific, and Cultural Organization, "Statement by Experts on Race Problems," 20 July 1950, UNESCO/SS/1.

[736] UNESCO, "Statement by Experts," (1950), 2.

Point six continued in this vein: "National, religious, geographic, linguistic, and cultural groups do not necessarily coincide with racial groups."[737]The original 1950 race statement was heavily criticized by physical anthropologists and others for its assertion (conveyed in point fourteen) that race was "not so much a biological phenomenon as a social myth," created by humans and with limited ontological or epistemic value.[738]

A heavily revised second statement was released in 1951 with the input of a larger group of physical anthropologists and biologists. The authors of the second statement greatly qualified their rejection of racism, and argued for the retention of race as a useful and valid biological concept. The 1951 statement treated the linguistic point in much the same way as it had been described in the 1950 iteration, although with slight modifications of language:

> National, religious, geographical, linguistic and cultural groups do not necessarily coincide with racial groups; and the cultural traits of such groups have no demonstrated connexion with racial traits. Americans are not a race…nor are people who live in Iceland or Britain or India or who speak English or any other language, or who are culturally Turkish or Chinese and the like…[739]

In 1952, UNESCO published *The Race Concept: Results of an Inquiry*, which included the excerpted criticisms and comments of the experts on each point of the revised Race Statement. The rejection of the race-language linkage passed almost entirely without comment; Kenneth Mather, a geneticist from the University of Birmingham, expressed his agreement, noting that

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[737] UNESCO, "Statement by Experts," (1950), 2.
[738] UNESCO, "Statement by Experts," (1950), 3-4. "The biological differences between ethnic groups should be disregarded from the standpoint of social acceptance and political action. The unity of mankind from both the biological and social viewpoints is the main thing."
[739] "Statement on the Nature of Race and Race Differences, by Physical Anthropologists and Geneticists—June 1951," in UNESCO, *The Race Concept: Results of an Inquiry* (Paris: UNESCO, 1952), 12.

while the people living in one country or speaking one language certainly could be one race, they need not be, "and it so happens that in general they are not."[740]

The only objection was raised by German geneticist (and former Nazi Party member) Fritz Lenz, who believed it was inaccurate to say that cultural and racial-biological traits had no correlation whatsoever. "From the purely empirical point of view," he wrote, "there are obvious correlations between the cultural and racial traits of human groups, and more particularly with regard to primitive cultural groups."[741] Relative to other statements made by Lenz and several of the other German anthropologists and geneticists (among them Eugen Fischer and Hans Weinert), these particular comments were mild. At one point, Alfred Métraux, who was coordinating the gathering of comments on the revised race statement, vented angrily that it was almost necessary to put the answers from Germany into a special chapter, owing to "the violence of their tone and their racialist inspiration."[742] Writing later to another colleague, Métraux reflected bitterly on the frustrations of attempting to manage the German contingent, members of whom had now accused Métraux of violating democratic principles for trying to modulate some of their remarks. "I have always wanted to be a good European," wrote Métraux in March 1952, "and I was one of the first ones to reach my hand to my German colleagues…Of course, they are entitled to their ideas about race, but I do not think it is fair to accuse us of anti-democratic procedure."[743]

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[740] UNESCO, *The Race Concept: Results of an Inquiry*, 46.
[741] UNESCO, *The Race Concept: Results of an Inquiry*, 46.
[742] Alfred Métraux to Ernest Beaglehole, February 1, 1952. Folder 323.12 A102 Statement on Race Part IV from 1/I/1952 to 31/III/1953, UNESCO archives, Paris.
[743] Alfred Métraux to Hans Nachtsheim, March 19, 1952. Folder 323.12 A102 Statement on Race Part IV from 1/I/1952 to 31/III/1953, UNESCO. Nachtsheim, a geneticist based in Berlin, was the only German commentator on the Race Statements who had not formerly been a party member, and was Métraux's point of contact for recruiting German scientists to join the UNESCO effort. The echoes of the First World War can be seen in Métraux's thinking, especially in his attentiveness to mitigating the isolation of German science after the war and his concern for maintaining European unity. Fischer, Weinert, and Lenz

Repeatedly, postwar anthropologists and biologists reiterated that race was real and necessary, a meaningful category of biological difference and categorization, even if it should have no bearing on the political or social standing of a person or population. Additionally, if race was exclusively biological, then cultural or psychological factors were irrelevant to tracing the long history of the human species. The story of human evolution could only be told through rocks and fossils. Cultural material, social practices, and the historical development of languages belonged to a different ontological domain.

Ironically, accessible books written to publicize the new ideas about race and human equality still gestured to the Asian origins of humanity—even though that theory was no longer accepted, and its fall from grace was at least in part due to the rejection of the Aryan race concept that had motivated the production of these books in the first place. For example, in 1952 the UNESCO Department of Mass Communications produced a picture book for schoolchildren titled *What is Race? Evidence from Scientists*.[744] The book included suggested questions for teachers and discussion leaders, quizzes to test the reader's knowledge of what constituted a "race."[745]

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also have more complicated intellectual and political trajectories; on this topic in general (and Fischer in particular), see Teslow, 313-315, and Robert Proctor, "From *Anthropologie* to *Rassenkunde* in the German Anthropological Tradition," in George W. Stocking, Jr., ed., *Bones, Bodies, and Behavior: Essays in Biological Anthropology* (Madison: University of Wisconsin Press, 1988), 138-179.

[744] Diana Tead, *What is Race? Evidence from Scientists* (Paris: UNESCO Dept. of Mass Communications, 1952). See also 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.

[745] Tead, 72-75. Examples include: Mediterraneans (a race), Chinese ("may refer to a nation, a culture, a civilization or language, but not to a race."), Aryans ("Aryans as a race do not exist. Aryan is a linguistic term…"), Negroes ("belong to one of the major groups of mankind."), Australians ("It depends on who is using the word."), and Russians ("a national, or even more correctly a cultural group, the correct term for their nationality being citizens of the Soviet Socialist Republics, which comprise many racial elements. 'Russian' refers to the inhabitants of a certain territory in Europe.")

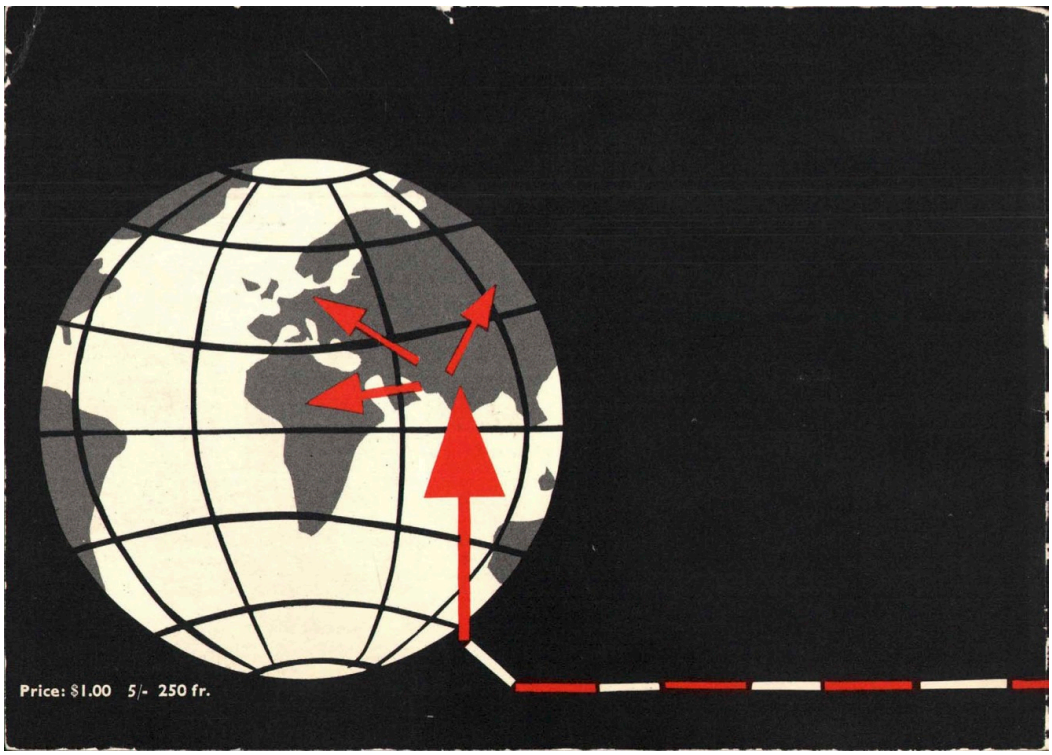
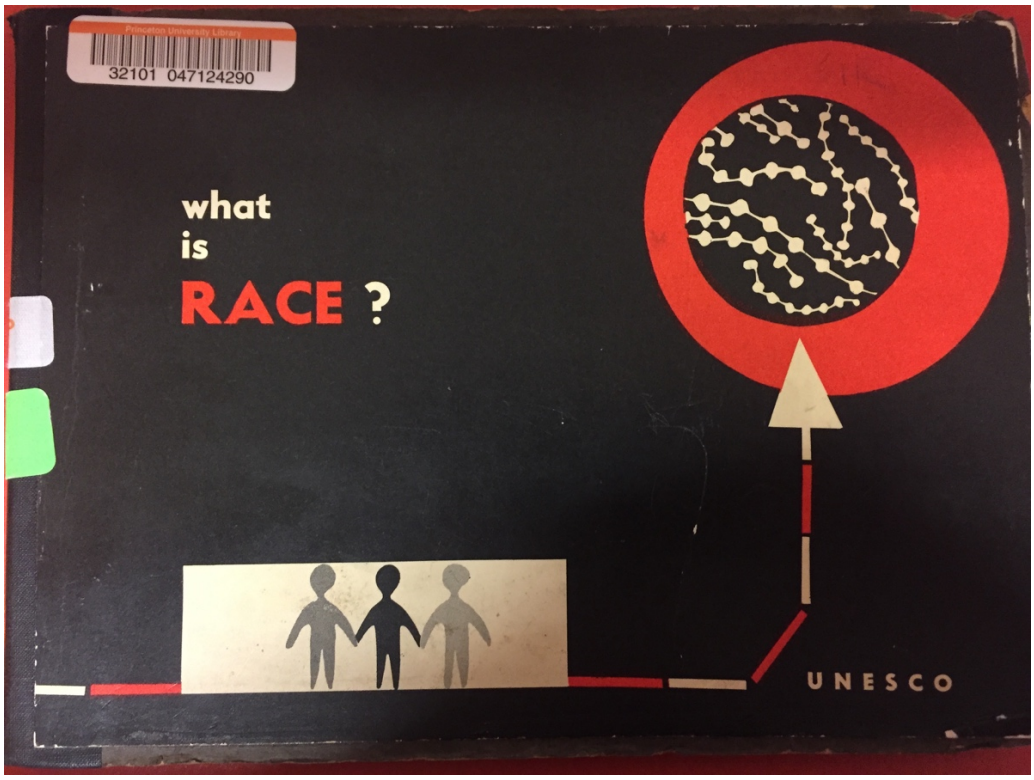


Figure 22 Back and front covers of Diana Tead, *What is Race? Evidence from Scientists* (Paris: Unesco Dept. of Mass Communications, 1952). The arrow connects the magnified gene image on the front to the Asian origins of humanity on the back cover.



It also included elegant and striking illustrations that resembled the product of the modernist Isotype graphic design movement.[746] The cover of the book was a wrap-around design, showing three abstract grey and black human figures in a line, linking hands, and a red and white arrow coming from the back cover and pointing to a highly stylized depiction of genetic material, drawn as white dots connected by lines, surrounded by a thick red circle.[747] On the back cover, the arrow leads to a second illustration, a white and grey image of a globe overlaid with smaller red arrows. The main arrow connects the DNA image from the front cover to a spot on the map somewhere in northern India or Pakistan; three smaller arrows diverge from that point, showing movement north-west in Europe, north-east into Central Asia and East Asia, and west/south-west across the Arabian Peninsula and into Africa.

One of the first illustrations in the book was a taxonomic tree of hominin ancestry, which drew a meandering path from a lemur-like first primate through the collection of well-known European hominin specimens (including the questionable Piltdown Man) before ending up at *Homo sapiens*.[748] Small text at the bottom of the page read:

> These men lived at the time of the early glacial periods, starting perhaps half a million years ago. From the shape and other characteristics of the skull, we know that each type showed gradual improvement until finally a new species evolved, *Homo sapiens*.[749]

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[746] Bangham, 88-92.
[747] The twenty-first century reader is likely to be amused by the marked lack of iconic double-helix representations of DNA (Watson and Crick would announce the discovery of the structure of DNA the following year, 1953).
[748] The choice of fossils in this diagram is unusual; the only non-European fossil is Ngandong Man, which was a *Pithecanthropus* fossil found by von Koenigswald in Java in the mid-1930s. The others are Swanscombe Man (Britain); Steinheim Man (Germany); Mount Carmel Man (Palestine, discovered by British-American expedition); Fontechevade Man (France); Piltdown Man (Britain); and Neanderthal Man (Belgium, France, Germany).
[749] Tead, 10-11.

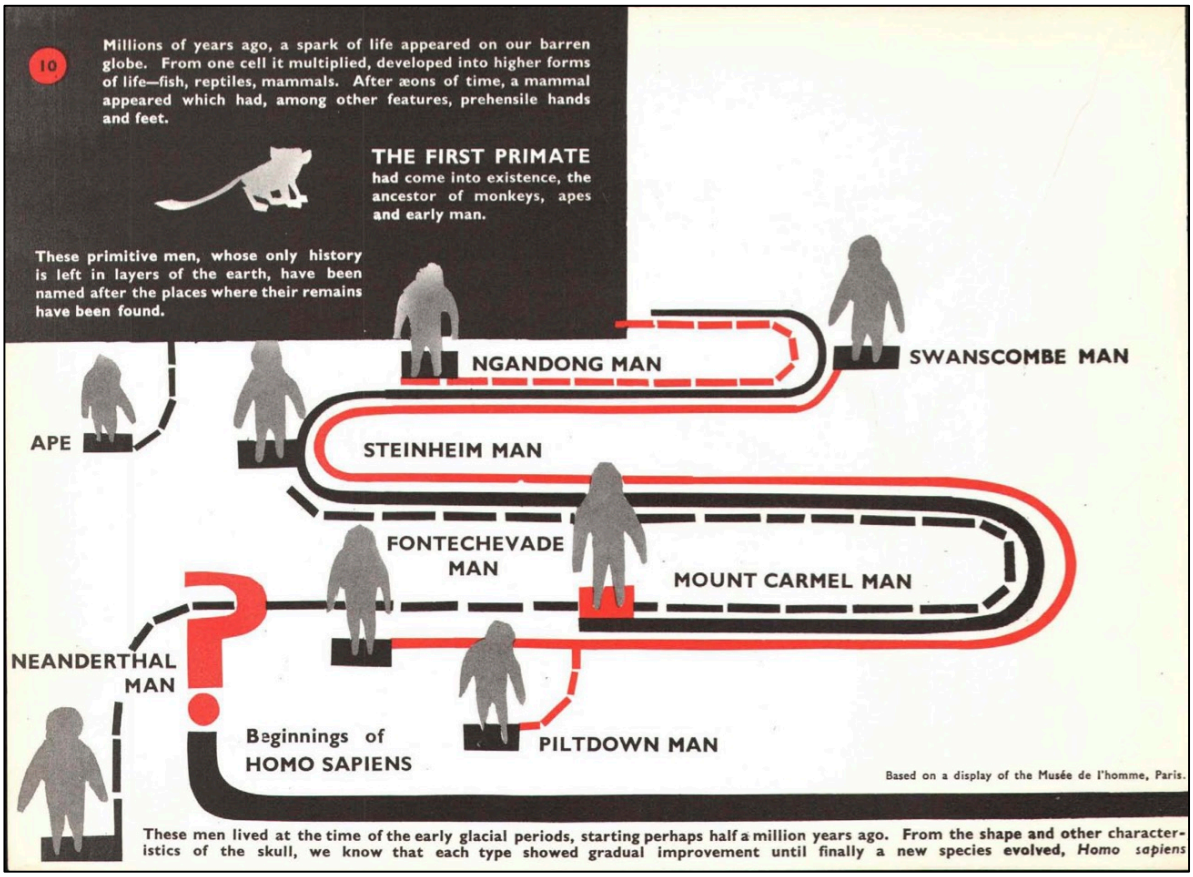


Figure 23 Illustration showing hominin ancestry from Diana Tead, *What is Race? Evidence from Scientists* (Paris: UNESCO Department of Mass Communications, 1952), 10.

The key point of the illustration was made clear in the final sentence: "All men living today belong to a single species, *Homo sapiens*, and are derived from a common stock."[750]

The map-and-arrows design appeared again inside the book, in a two-page illustrated spread under the heading "Geographical isolation has been the great race-maker." The "Common Ancestors" were drawn in northern India or Pakistan, and four arrows came out from the central figures, heading towards Europe (filled with small, light-grey abstract figures labeled "Caucasoid"), Africa (black figures labeled "Negroid"), and southeast Asia and East Asia

[750] Tead, 11.

(medium-grey figures labeled "Mongoloid"). The arrow that pointed north and east towards China, Korea, and Japan continued up into the Russian Far East, with a line of little arrows continuing across the Bering Strait and down into the Americas, where more medium-grey figures were drawn under the heading "Mongoloid (American Indian)."[751] The point of the drawing was to illustrate how races could form by entirely natural biological processes:

> Races were formed by the complex processes of MUTATION, SELECTION, ADAPTATION, MIGRATION, ISOLATION. As people became widely separated the new traits brought about by mutation became predominant in three of the major groups of races.[752]

The page concluded "Doubt still exists about where the early men, our common ancestors, appeared. It may have been in the Near East or Africa, rather than in Pakistan and India." This "where" was largely unimportant; the central focus in *What Is Race?* was the explanation for how human racial diversity had come into being. The text's implicit argument was that these differences were merely of interest to scientific classifiers, and should not be used to make judgments on the capabilities or weaknesses of different human groups.

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[751] Tead, 38-39. Interestingly, the maps-with-arrows trope did not immediately re-appear in the African origins literature, although my sample size is limited. However, it seems provocative that in two richly illustrated magazine stories on the Leakeys and the discoveries at Olduvai, one published in *National Geographic* in 1960 and one in *The Observer* (the Sunday magazine of the UK paper *The Guardian*) there were maps showing dig sites, but no arrows. See Des Bartlett and Louis S.B. Leakey, "Finding the World's Earliest Man," *National Geographic Magazine* 118, no. 3 (September 1960), 420-435; and John Davy, Ian Berry, and Maurice Wilson, "The Search for the Origins of Man," *The Observer* (January 23, 1966), 14-21. In the anthropology textbook *Man's Place in Nature*, written by C.F. Hockett in 1973, there are illustrations showing the distribution of prehistoric tool cultures, with different symbols showing different periods of time (thus an implicit demonstration of the progression out of Africa—see page 391) and a map showing approximate human distribution as of 100,000 BCE (page 401). See C.F. Hockett, *Man's Place in Nature* (New York: McGraw-Hill, 1973). I suspect that the map with arrows illustration makes a resurgence in the 1980s with the rise of mitochondrial DNA studies and the tracing of "Mitochondrial Eve."

[752] Tead, 38-39.

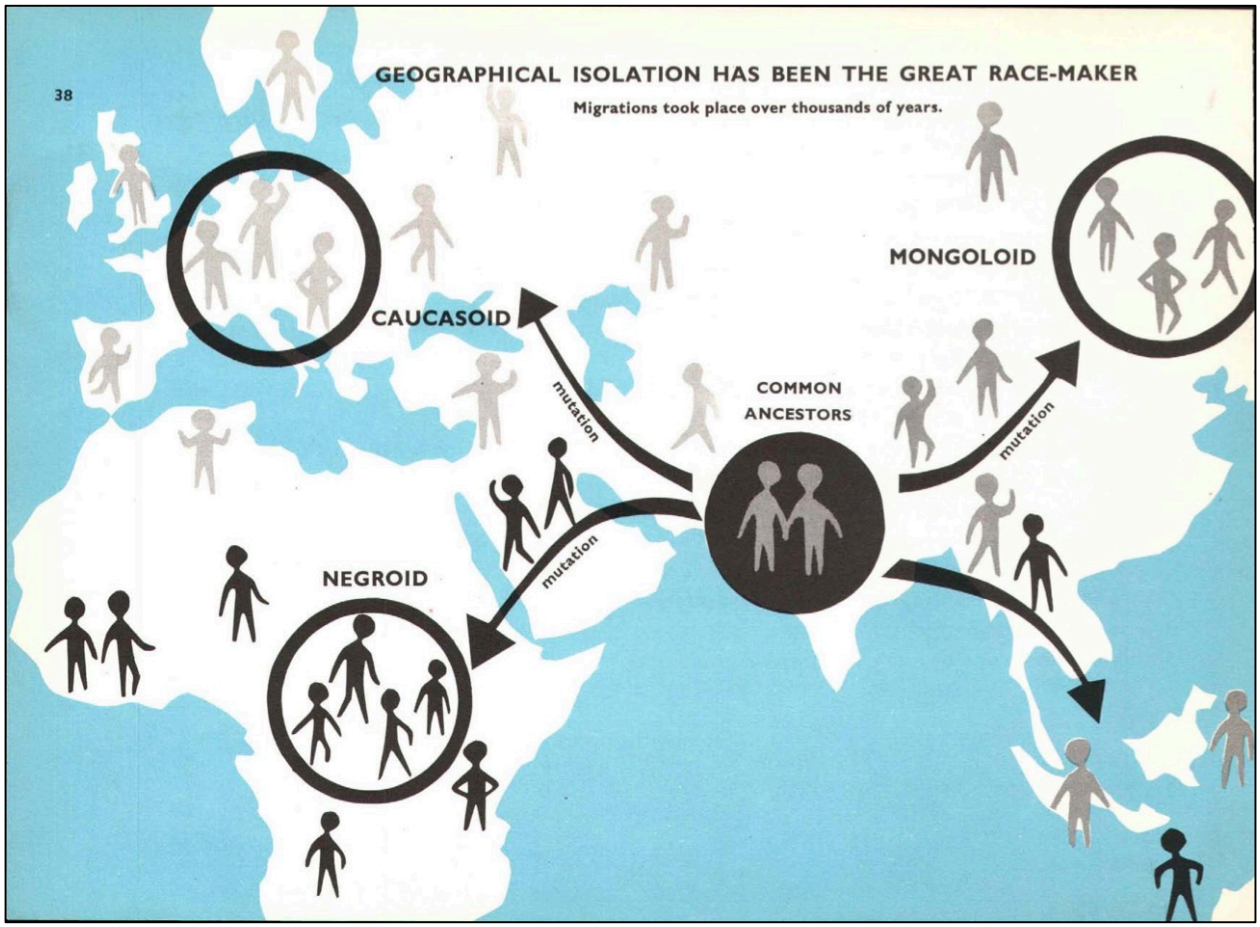


Figure 24 Illustration showing origins of humankind in northern India, from Diana Tead, *What is Race? Evidence from Scientists* (Paris: UNESCO Department of Mass Communications, 1952), 38.

Darwinian Prophesy

By the 1950s, the idea of African origins was becoming more widely accepted in scientific circles, and the concept of African origins was beginning to spread into the public international consciousness. A new narrative emerged that back-dated the emergence of the out of Africa hypothesis to Darwin in 1871, and the first proof-of-concept to Dart in 1925. Leading paleoanthropologists publicly advocated for their work and their theories of humanity's geographical origins in the 1950s. These narratives were written for broad public consumption, and told the story of paleoanthropological discovery as an extension of the author's personality

and career in the sciences. Comparing Raymond Dart's autobiography and radio lectures with G.H.R. von Koenigswald's autobiography shows that the paleoanthropological consensus on African origins was not monolithic by the mid-1950s, especially for a researcher like von Koenigswald who had made his mark in Asian paleoanthropology.

The great irony, however, was that just as Dart was defining himself in print and radio as the scientist who had made the most important discovery of the century in human evolution, he was very much on the margins in his own country. From 1939 until 1948, paleoanthropology had enjoyed a privileged position in the South African political milieu, because of the enthusiastic patronage of Prime Minister Jan Smuts. Smuts believed in the power of science to put South Africa on the map, whether it was the science of the very old (human origins) or the very new science of radioactivity and atomic fission. The first South African uranium mine, for example, opened near Johannesburg in 1951.[753] South Africa emerged from the Second World War hungrily eyeing the possibility of an increased presence on the international stage. This spirit spread even to the *South African Archaeological Bulletin*, which issued a call to its members to gather reprints of articles to send to French institutions to help them build up their backlists and awareness of new developments after the war.[754] Smuts spent the final three years of his time as South Africa's prime minister working assiduously on the political organization of the newly

[753] As argued previously, economic geology and human origins research have critical points of intersection, because mining frequently provides the baseline surveying knowledge necessary for identifying strata where hominin or other fossils are found. Mining also tends to increase funding to geology departments, often with a spill-over benefit for programs in archaeology and paleontology. South Africa's gold and diamond mines had been world-famous for several decades by this point, and the importance of South African mineral production to the world economy had increased enormously during the Second World War. See Raymond Dumett, "Africa's Strategic Minerals During the Second World War," *The Journal of African History* 26, no. 4 World War and Africa (1985), 381-408. On the longer history of South African uranium mining, see Gabrielle Hecht, *Being Nuclear: Africans and the Global Uranium Trade* (Cambridge: The MIT Press, 2012), especially "Migrant Miners," in ch 7.
[754] "Editorial Notes and News," *South African Archaeological Bulletin* 1, no 2 (March 1946), 31.

created United Nations, while also managing to keep up with new paleoanthropological literature, materially support scientific research, and even take tea with visiting researchers, as he did with Wilfrid Le Gros Clark for half an hour on the morning of January 3, 1947.[755] Smuts also sponsored the airplane to take Dart, Broom, Le Gros Clark, and other researchers from South Africa to Kenya for the 1947 Pan-African Congress. In 1948, Smuts's United Party lost to the Nationalist Party (NP) in the South African parliamentary elections.[756] To the NP, which was closely allied with the South African Dutch Reformed Church, evolution research was clearly on the side of both secularism and racial equality; paleoanthropology was both a religious and political heresy. The Christian-nationalist ideology of the NP had been in development for at least the previous twenty years—roughly contemporaneous with Dart's paleoanthropological career.[757] Smuts died in the fall of 1950, at the age of 80, and Robert Broom followed six months later, aged 84. Raymond Dart was left to carry on as the leading figure in South African human origins research, but instead of presiding over a new era of South African paleontological primacy, Dart found himself scrambling for funds in an unfriendly environment.

The first paleoanthropological casualty was the Second Pan-African Archaeological Congress, which had been proposed during the first congress of 1947. Planning began immediately, and a general proposal for an organizing committee was drawn up by 1948.[758] The proposal included major roles for the government of the Union of South Africa, which would take responsibility for issuing official invitations to representatives of the major colonial powers

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[755] South African journal entry for Jan. 3rd, 1947. Wilfrid Le Gros Clark papers, series 21, Mss.Eng.misc.f.838. Le Gros described Smuts as "very affable."
[756] Kuljian, 109-112.
[757] Saul Dubow has discussed the intersection of Afrikaaner nationalism, race science, and religious ideology in his *Scientific Racism in Modern South Africa* (Cambridge: Cambridge University Press, 1995). See in particular ch 7, "Christian-national ideology, apartheid, and the concept of 'race.'"
[758] A.J.H. Goodwin, "Second Pan-African Congress on Prehistory, 1951," *The South African Archaeological Bulletin* 3, no. 9 (March 1948), 16-17.

with interests on the African continent, as well as representatives of major international scientific organizations, and whoever was the standing Prime Minister would be appointed as the honorary president of the congress. (The proposal also noted that the South African government had offered to cover a large portion of the congress's bills.) However, with the government now under the control the NP and Prime Minister Daniel François Malan, there was no chance this paleoanthropological congress would be permitted to take place in Johannesburg.

The Second Pan-African Congress was instead moved to Algiers and held in the fall of 1952, with the enthusiastic backing of the French government.[759] The congress was also massively expanded to incorporate a range of anthropological, geological, and paleontological studies, including some that had nothing to do with Africa.[760] Mary and Louis Leakey (represented on this occasion by Louis) were fêted for their recent discovery of "an astounding collection of absolutely perfect fossil insects and soft fruits from the Miocene beds of Kenya," which allowed them to partly reconstruct the habitat and ecosystem of the *Proconsul* fossil apes.[761] However, noted American archaeologist L. Cabot Briggs, reporting live as the director of Algerian Studies for the American School of Prehistoric Research, "the question of the relationships, if any, between *Proconsul* and the Australopithecine and Human ancestral stocks"

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[759] By sponsoring the 1952 Congress and locating it in Algiers, the French government guaranteed that French and Francophone scientists would play a much larger role in the proceedings; a congress in Anglophone South Africa would have had a much smaller French presence, due to both language and geography. Additionally, while the South African government refused the Congress because of its secularism and evolutionary content, hosting an elite scientific conference on human evolution in Algeria reinforced the official French commitment to *laïcité*, modernity, and science, especially in the context of French policies that attempted to limit the political and social influence of Islam in Algeria. See John Ruedy, *Modern Algeria: The Origins and Development of a Nation*, 2nd ed. (Bloomington: Indiana University Press, 2005).

[760] See Emanuel Vlček, "New finds of the Diluvial man in the Bohemian Karst (Czechoslovakia)" in Lionel Balout, ed. *Congrès Panafricain de Préhistoire Alger 1952, Actes de la IIe Session* (Paris: Arts et Métiers Graphiques, 1955), 787-790.

[761] Quotation is from L. Cabot Briggs, "Second Pan-African Congress on Prehistory," *Archaeology* 5, no. 4 (December 1952), 246. Morell also discusses the seed and insect finds in *Ancestral Passions*, 159.

was still open.[762] "The deepest regret was expressed (and most sincerely felt by all present) at the absence of a South African delegation," wrote archaeologist Sonia Cole in a report on the congress two months later.[763] The South African government had refused the scientific delegation permission to accept the official invitation.

It was in this context that Raymond Dart organized a series of nine lectures for radio that were broadcast on the English program of the South African Broadcasting Corporation in 1953.[764] The series title was "Africa's Place in the Human Story."[765] In the booklet published under Dart's editorial guidance after the program went off the air, which re-created the major points of the radio address, we can see the teleological narrative of the discovery of the African origins of humanity beginning to take shape. Dart began his introduction with a reference to the famous quotation in Pliny's *Natural History*, "Out of Africa, always something new."[766] The modern recognition that this "something new" might have also historically included *Homo*

[762] Cabot Briggs, "Second Pan-African Congress," 246.
[763] Sonia Cole, J.D. Clark, and Oliver Davis, "The Second Pan-African Congress on Prehistory," *The South African Archaeological Bulletin* 7, no. 28 (December 1952), 150.
[764] According to Dart, the Corporation received so many letters of interest that the lectures were published in a booklet, under his editorial guidance. All quotations in this article are taken from the published booklet text. See Raymond A. Dart, ed. *Africa's Place in the Human Story* (Cape Town?: South African Broadcasting Corporation, 1953).
[765] Dart also did a radio series in 1959 titled "Africa's Place in Human Civilization," which Saul Dubow frames as an extension or expansion of a 1931 radio series on cultural diffusion and theories (advanced very confidently by Dart) of prehistoric cultural contact between Africa and Asia. Dubow folds "Africa's Place in the Human Story" into this larger arc of Dart's radio engagements, but the content of "Human Story" is very different, being much more focused on evolution approached through anatomical, paleontological, and geological study than on prehistoric culture and the emergence of civilization. (It was also not entirely written by Dart.) See Saul Dubow, *Scientific Racism in Modern South Africa*, 46-47 (including ft. 69).
[766] Dart, "Introduction," *Africa's Place in the Human Story*, 2. The phrase is also glossed in the *Suda*, a massive 10th century CE Byzantine Greek historical encyclopedia of the ancient Mediterranean world as "Always Libya produces something bad," in the original Greek, and is explained as a proverb "in reference to those who do bad things and who are always discovering some new kind of bad thing." (See Suda Online Database, entry alpha-iota 104 http://www.stoa.org/sol-entries/alphaiota/104. Many thanks to Caroline Mann for this point.) The tenth century gloss may be more accurate for describing how many British anatomists responded to Dart's 1925 article announcing *Australopithecus*.

sapiens was dated back to Darwin. But the idea failed to gain traction due to historical novelty and, apparently, the Industrial Revolution:

> Darwin's idea of close relationship with apes was too new and people were much too distracted about business affairs to worry about the novelties Africa might have bearing upon this aspect of the human story…Civil war was being fought over African slaves in America and the Suez Canal was being opened up in the North of Africa. The principal new things of importance coming out of South Africa were the diamonds discovered soon afterwards at Kimberley. Although the slave trade was finished for Europeans, Equatorial Africa was found to have untold commercial values in palm oil, ivory, gold, timber and cocoa; and the whole continent was being completely partitioned. Finally, in 1886 gold was discovered on the Rand.[767]

"People did not have too much time to spend on oddities amidst the Industrial Revolution," wrote Dart, but since the fortuitous encounter with the Taungs skull almost thirty years before, it had been his "inescapable fate" to write about man-apes and the emergence of the human species: "So much has already been written about these creatures that trembled on the brink of humanity that there may be little entirely new from Africa in these pages."[768] To make it clear how generally accepted and not-new his African hypothesis was, Dart gave very little space to alternate precursor theories. In his lecture "The Proto-Human Inhabitants of Southern Africa," Dart ran through the criticisms his 1925 conclusions on the Taungs skull had faced: wrong "body size, stature, teeth, geographical situation, brain volume and intellectual capacity."[769] Out of all these incorrect features, though, the worst of all was the "unexpected place [the skull] came from, away down south in Africa."[770] The proper place, Dart reminded his readers, was supposed to be Asia, since the all-too-primitive Java Man had been found there in 1891. When his

[767] Dart, "Introduction," 3.
[768] Dart, "Introduction," 5.
[769] Raymond Dart, "The Proto-Human Inhabitants of Southern Africa" in *Africa's Place in the Human Story*, 20.
[770] Dart, "Proto-Human Inhabitants," 20.

announcement of the "puny South African infant discovered by sheer accident at Taungs" was made, the rest of the world was looking in the direction of China, distracted by the teeth and then skulls of Peking Man:

> All these pointers along with the teeming human populations of India and China and the establishment of ancient civilizations in the near East, had contributed towards giving everybody in Europe and America who thought about these things, the idea that if there was any such object as a missing link it should also be found in Mother Asia.[771]

Dart gave the Asian hypothesis very little consideration beyond the paragraph quoted here. The rest of his lecture ranged widely on the history of fossil excavation in South Africa, ideas about the manufacture of bone tools and whether the Australopithecines had made weapons or used fire.[772] The lecture text was broadly speculative, and focused on Dart's freewheeling ideas about the histories of African pre-humanity, but it did acknowledge that Africa had seemed geographically implausible and that the timing of the Taungs discovery was unlucky since it was quickly overshadowed by the much more compelling discoveries at Zhoukoudian.

Other speakers in the radio series granted the Asian origins hypothesis significantly more weight and historical validity. Phillip Tobias, then senior lecturer at Wits in anatomy (he would take over Dart's role in the department after the latter's retirement in 1959), spent several paragraphs reviewing the prehistory of his intellectual field and piecing together a holistic picture of the evidence from many parts of the globe that allowed scientists to trace back the primate line in species change, time, and space.[773] H.B.S. Cooke, a senior lecturer in geology at Wits who gave the lecture "Primitive Mammals and Primates of Africa" credited Darwin with a

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[771] Dart, "Proto-Human Inhabitants," 20.
[772] On Dart's willingness to make incredibly confident and wildly speculative statements in professional contexts, see Robin Derricourt, "The Enigma of Raymond Dart," *The International Journal of African Historical Studies* 42, no. 2 (2009), 257-282.
[773] P.V. Tobias, "The Very Ancient Human Inhabitants of Africa," in *Africa's Place in the Human Story*, 23-26.

"cautious nature" when he ventured a claim that was "until very recently, thought to be very wide of the mark," suggesting that Africa was the cradle of the human species.[774] Cooke explained the re-evaluation of Darwin's hypothesis as the result of data accumulation; before the 1930s, "too few fossils had yet been found in the little-known continent of Africa to allow its claims to compete with those of Asia."[775]

To Cooke, Dart's 1925 announcement of *Australopithecus* should have led to at least a reconsideration of the plausibility of African origins, but "most of the scientists of the world refused to accept the evidence." It was the combined weight of Broom's expanded body of Australopithecines and the Miocene ape fossils discovered by the Leakeys in East Africa in the late 1940s that swung the balance in favor of Africa. The Miocene apes showed the expansion and diversification of primate stocks in Africa, as well as plausible paths of migration to Asia that fell in the right place on the geological timeline. When the East African data was combined with Broom's (not Dart's) very interesting man-like apes, Cooke comfortably concluded that "Our African continent thus occupies a place of supreme importance in the human story."[776]

The language of possession was important throughout the lecture series, and was not just a tic of Cooke's. Dart also drew rhetorical connections between evolutionary progress and the advance of white settler colonialism. The conquest of nature went hand in hand with the conquest of territory and people – in fact, the distinction between the two categories was treated as essentially moot, especially by Dart, who would slip between discussing European interest in African great apes and African people—who he referred to as "Bushmen, Pygmies, Hottentots"—in the same breath.[777] The implicit end-point of these evolutionary developments in

[774] H.B.S. Cooke, "Primitive Mammals and Primates of Africa," in *Africa's Place in the Human Story*, 17.
[775] Cooke, "Primitive Mammals," 17.
[776] Cooke, "Primitive Mammals," 18.
[777] See Dart, "Introduction," 2-3.

Africa was the modern Union of South Africa, including white minority rule. The appeal to national pride, in terms of both the historical significance of the region and the cutting-edge scientific work that was now being done by South Africans, to the envy of the rest of the world, allowed Dart and his co-speakers to thread the needle of apartheid and National Party politics, without running afoul of the anti-evolution views of the political leadership. By making the story of human origins about *Australopithecus* and (white) African pride, it was possible to render the work acceptable.[778] Saul Dubow has noted that the NP's attitude towards science in the first decade of apartheid was characterized by pragmatism, with a cautious attitude towards institutional disruption and a disinclination to be cut out from participating in international scientific organizations. It was permissible for scientists to talk about racial hierarchies, but not about the theory of evolution – which probably explains why Dart ascribed nineteenth-century negative reactions to Darwin's theories to Victorian obsessions with natural resource exploitation and industrial development, rather than to Victorian belief in Christian religious doctrine.

Dart's radio series was only broadcast in South Africa, but his autobiography, written over the years 1955 to 1959, would reach a much larger international audience. *Adventures with the Missing Link* was published in 1959, and essentially codified Dart's story of the *Australopithecus* discovery, his thirteen or so years as a lone voice in the wilderness, and the subsequent validation and worldwide acclaim that came when other scientists began to agree with his conclusions.[779] Both the book's tone and its existence in the first place were due to the influence of the American science writer Robert Ardrey, who came to Johannesburg in 1955 to

[778] See Dubow, *A Commonwealth of Knowledge*, 256-257.
[779] Raymond Dart with Dennis Craig, *Adventures with the Missing Link* (New York: Harper & Brothers, 1959).

write about Dart's theories about violence and human aggression.[780] The first half of *Adventures with the Missing Link* was a lively scientific adventure story, describing Dart's stunned and joyful moment of discovery when he successfully detached the Taungs skull from the breccia block in December 1924, and then his long trek towards both validation and vindication.

The second half of the book took up the subject of Dart's researches in the 1950, which dealt with the presumable cultural and intellectual capacities of *Australopithecus.* Dart's key claim was that the Australopithecines had been tool-users, making those items out of bones, wood, and horn (which explained the dearth of stone tools found in association with *Australopithecus* specimens). Furthermore, *Australopithecus* had used those tools as weapons, to kill both other animals and other Australopithecines, which was Dart's preferred explanation for the signs of head trauma that he observed in the original Taungs *Australopithecus* skull. Marshall T. Newman, reviewing *Adventures with the Missing Link* for *Science* in February 1960, wrote that the book ends "rather lamely," since there was virtually no evidence to back up Dart's more outlandish claims.[781] However, the first half of the book was entirely about how Dart had advanced similarly outlandish remarks in a related instance, and ultimately been hailed as a visionary—perhaps his osteodontokeratic culture claims would soon receive similar validation.

Adventures with the Missing Link has remained popular with journalists and paleoanthropologists who are writing journalistic accounts of their own field, since Dart's vivid, punchy description of slowly separating the Taungs skull from the breccia matrix is a wonderful

[780] Dart, *Adventures*, xviii. Ardrey's article about his time in South Africa was called "A Slight (Archaic) Case of Murder," published in *The Reporter* in 1955. On Ardrey and his writings on the place of violence in evolution, see Erika Lorraine Milam, *Creatures of Cain: The Hunt for Human Nature in Cold War America* (Princeton: Princeton University Press, forthcoming 2018).
[781] Marshall T. Newman, review of Raymond Dart (with Dennis Craig), *Adventures with the Missing Link*, in *Science* 131, no. 3400 (February 26, 1960), 603.

story, dropping the reader into the very moment of discovery.[782] But the discovery and the text were separated by more than thirty years, and Dart's preoccupations and concerns in 1955-1959 were not identical to those of 1925. Both the radio series from 1953 and the text of *Adventures with the Missing Link* show the ways that Dart was crafting the narrative of his discovery after the results had been validated, and responding to contemporary political conditions and intellectual currents, while also attempting to create a favorable environment for the reception of his latest highly controversial research and shape his legacy, especially since he stepped down from his position as the chair of anatomy at Wits in 1958, right before *Adventures* was complete.

However, there were still popular paleoanthropology books first published in the 1950s that did not unequivocally support the African origins hypothesis. Ralph von Koenigswald's *Begegnungen mit dem Vormenschen* was published in German in 1955, and translated into English as *Meeting Prehistoric Man* in 1956.[783] It was published in New York by the same house that would later handle *Adventures with the Missing Link*, Harper and Brothers, and similarly combined personal autobiographical details of von Koenigswald's life as a scientist with discussions of major discoveries and changing theories of human evolution in the previous seventy or so years. Only two years older than Louis Leakey, von Koenigswald was the last living representative of the interwar generation of European and American paleoanthropologists who had worked on the Central Asian origins hypothesis and performed extensive fieldwork in

[782] Martin Meredith's *Born in Africa* block-quotes large sections of *Adventures with the Missing Link* in the chapter on Dart, for example.
[783] G.H.R. von Koenigswald, *Begegnungen mit dem Vormenschen* (Düsseldorf: E. Diederich, 1955) and G.H.R. von Koenigswald, *Meeting Prehistoric Man,* trans. Michael Bullock (New York: Harper & Brothers, 1956). It seems to have had a much more limited print run than *Adventures with the Missing Link*, and as far as I know, von Koenigswald never made contact with anyone with as much literary or publicity clout as Robert Ardrey.

the region.[784] *Meeting Prehistoric Man* fit into the genre of scientific-but-still-accessible books published about paleoanthropology, biology, evolution, and human nature in the 1950s, but it told a very different historical and intellectual story of human origins research, especially when compared with Dart's retellings of the same period.

In one early chapter section, titled "From Darwin to Dubois," von Koenigswald described how scientists like Eugène Dubois were aware of Darwin's Africa suggestion in the late nineteenth century, but had found Haeckel's geographical logic more convincing. The largest part of the book dealt with von Koenigswald's work in Java on different forms of *Pithecanthropus* and his collaborations with Franz Weidenreich on *Sinanthropus* in Beijing. The penultimate section of the book discussed Africa. For von Koenigswald, it was a fact that the oldest fossil primate remains that had yet been identified were African, as were the "singular half-men" found by Dart and Broom in South Africa. However, he wrote:

> The role played by Africa in the evolution of man is not yet clear. The oldest elephants are also African, and yet the transition from the primitive forerunner to the type of elephant still extant took place in Asia.[785]

This was partially a problem of chronology: many of the *Australopithecus* fossils had been found in cleft fillings that were almost certainly intrusions into much older geological formations (or had no geological context at all, due to mining). The timeline was incredibly challenging to track, and if it could be shown that the Australopithecines had lived on earth at the same time as *Pithecanthropus*, for example, then it was more likely that they were a kind of fossilized ape.

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[784] W.D. Matthew had died in 1930, Davidson Black in 1934, Henry Fairfield Osborn in 1935, Arthur Smith Woodward in 1944, Franz Weidenreich in 1948, Émile Licent in 1952, Arthur Keith and Teilhard de Chardin in 1955. Von Koenigswald's Chinese and Indonesian colleagues were for the most part, however, alive and well – Pei Wenzhong outlived von Koenigswald by about two months (they both died in 1982).

[785] von Koenigswald, *Meeting Prehistoric Man*, 145.

The human-adjacent features of the Australopithecines were interesting, but they didn't necessarily confirm that *Australopithecus* lay directly in the human evolutionary line. Von Koenigswald also quipped that this was something of a psychological issue, rather than a paleontological one: everyone wanted to be the possessor of the very oldest hominin finds.[786]

Another critical problem was *Australopithecus*' very small, highly undeveloped brain. "Although they are to be regarded as morphologically human in the widest sense," wrote von Koenigswald, the Australopithecines:

> …were stuck fast at the simian level. They do not represent a group at an earlier phase of the same line of development as that on which *Pithecanthropus* and *Meganthropus* lie; and their over-specialization puts them out of court as a primitive stage of ancient man.[787]

It wasn't that von Koenigswald believed absolutely in the power of craniometrics—"There are many people of great brilliance with relatively small heads"—but there were still constraints on what was possible with a very, very small brain. On those grounds, it made no sense to him to elevate *Australopithecus* above ape level.[788] *Australopithecus* could be found in southern Africa, and some preliminary fossil evidence suggested the same species could be found in East Africa as well. But there was no reason to believe that this meant the vector of migration had to run from south to north; fossilized primate teeth in China might yet prove that *Australopithecus* had roamed there too! In von Koenigswald's eyes, there was an equally good measure of evidence to surmise an Asian origin for *Australopithecus*, who had been displaced into remote corners of the earth by the rise of Pithecanthropoids. "Somehow or other," von Koenigswald concluded about the Australopithecines, "they missed the road to humanity."[789]

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[786] von Koenigswald, *Meeting Prehistoric Man*, 154.
[787] von Koenigswald, 162. *Meganthropus* was another giant Javanese hominin discovered by von Koenigswald in the 1930s.
[788] von Koenigswald, 162.
[789] von Koenigswald, 165.

His arguments were built from first-hand evidence, gathered on tours of South and East Africa in the early 1950s, which included a trip to Rusinga Island on the Leakeys' boat, the *Miocene Lady*, and a camping trip at Olduvai Gorge, as well as a short hike around Swartkrans, South Africa, with anatomist John Robinson. Von Koenigswald had not been an attendee at the 1947 Pan-African Congress—he was on his way to New York at the time, only freshly released from a POW camp in the Netherlands East Indies and heading to a fellowship at AMNH.

That von Koenigswald could come to Africa at all in the early 1950s shows one of the small advantages that the rise of African paleoanthropology offered for scientists who worked in European imperial powers: Africa was relatively close, especially as air travel across the continent increased in the 1950s. By way of contrast, by the time *Meeting Prehistoric Man* was published, von Koenigswald had been banned from returning to his former research sites in what was now independent Indonesia. Excavations at Sangiran had re-started in 1952 after a gap of more than ten years due to the Japanese occupation and the subsequent colonial violence as the Dutch attempted to reassert control over the archipelago.[790] In 1955, the Republic of Indonesia made a formal demand for the return of the Sangiran and Ngandong fossils, which von Koenigswald had brought with him first to New York City and then to his new position at the Rijksuniversiteit in Utrecht. Von Koenigswald fought the decision, arguing that many of the most important and impressive finds, particularly the *Pithecanthropus* specimens, had been excavated while he was a private citizen-researcher funded by the Carnegie Institution and that

[790] See Ronald H. Spector, *In the Ruins of Empire: the Japanese Surrender and the Battle for Postwar Asia* (New York: Random House, 2007); J.B. Robertson and J. Spruyt, *A History of Indonesia* (New York: St. Martin's Press, 1967); and M.C. Ricklefs, *A History of Modern Indonesia, since c. 1200*, 4th ed. (New York: Palgrave MacMillan, 2008). On archaeology specifically, see Teuku Jacob, "Palaeoanthropological Discoveries in Indonesia with Special Reference to the Finds of the Last Two Decades," *Journal of Human Evolution* 2 (1973), 473-485; and R. Soekmono, "Archaeological Research in Indonesia: A Historical Survey," *Asian Perspectives* 12 (1969), 93-96.

there were no museum or research facilities in Indonesia that could adequately preserve the delicate fossils.[791] The Indonesian government responded by declaring von Koenigswald *persona non grata* – and despite him still managed to gain control of the Ngandong crania, which had been unearthed while von Koenigswald had still been on the colonial government's payroll.[792] Access to fossil dig sites in east and southeast Asia was no longer as easy as it had once been for Europeans enmeshed in the power structures of their home country's colonial empires.

Louis Leakey, like Dart, also published new work in the 1950s that elided the earlier hiccups of his research in East Africa. In 1953, he completely rewrote his 1934 book *Adam's Ancestors: An Up-to-date Outline of What Is Known About the Origin of Man*, which made his and Mary's Miocene ape finds seem like the natural outcome of a lengthy, well-thought out research project, dating back to the late 1920s. He did not, however, talk particularly about Darwin; in fact, the one reference to Darwin in the original *Adam's Ancestors* was taken out, although the focus of the original quotation had not been a justification for looking for the "missing link" in Africa specifically, but rather a justification of looking for "missing links" at all.[793] In the revised *Adam's Ancestors*, Leakey wrote that "the evidence that is available today points very strongly to the African continent as the place where man and the great apes were

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[791] P. Marks and C.W. Drooger, "Levensbericht G.H.R. von Koenigswald," *Jaarboek 1983* (Amsterdam), 162. Dutch translation by EMK.

[792] 1955 was also the same year that Indonesia reached new prominence in world politics as the host nation for the Asia-Africa Conference held in Bandung, and opened a new round of talks with the Netherlands government over the dissolution of the Netherlands-Indonesian Union and the ceding of Papua to Indonesia. See *Asia-Africa Speaks from Bandung* (Djakarta: The Ministry of Foreign Affairs, Republic of Indonesia, 1955); Adrian Vickers, *A History of Modern Indonesia* (New York: Cambridge University Press, 2005), 126; and Ricklefs, *A History of Modern Indonesia,* 288.

[793] Louis Leakey, *Adam's Ancestors: An Up-to-date Outline of What Is Known About the Origin of Man*, 1st American edition (New York: Longmans, Green and Co., 1935), 160. Leakey replied to his hypothetical questioner that, in the first place, Darwin had said that humans and monkeys shared some common ancestor in the distant past, which was not the same as being descended from monkeys, and in the second place, that there was no *single* missing link. "As we try to trace back the ancestors of man we find that innumerable links are missing in the chain of evidence for which we are seeking." (160)

evolved."[794] However, readers should not assume that this work was in any way *complete*—there were "immense areas" where no prehistorian had explored at all, the "vast continent of Africa" was "so little explored from this point of view," and "much work remains to be done" on *Australopithecus*, including excavating known deposits of similar composition and geologic age in Angola, the Congo, and Northern Rhodesia (Zambia).[795]

In his 1953 radio broadcasts, Dart appealed to South African national pride and the appeal of technological modernity, reiterating that so much of Africa was now known, that the formerly "dark" continent was now traversable, excavatable, and legible in world history. Leakey, on the other hand, was looking towards the future and towards drawing in audiences with the promise of what had not yet been discovered. His financial situation had improved, due to grants from businessman Charles Boise, the government of Kenya, and a new permanent position as the curator of the Corydon Museum in Nairobi.[796] He also continued to supplement his income by working as a consultant for the Special Branch, working on both run-of-the-mill investigations and as a translator, advisor, and investigator for Kikuyu matters, especially as the Mau Mau insurgency grew in the early 1950s.[797] His professional reputation had risen after the first Pan-African Congress, and his collaboration with Le Gros Clark on a publication on Miocene hominins from East Africa for the prestigious "Fossil Mammals of Africa" series published by the London Natural History Museum further improved his scientific standing, especially with the British anatomical and paleontological community.[798] Unlike Dart, who was

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[794] Louis Leakey, *Adam's Ancestors: An Up-to-date Outline of the Old Stone Age (Palaeolithic) and What is Known About Man's Origin and Evolution*, 4th ed. (London: Methuen & Co., Ltd., 1953).
[795] Leakey, *Adam's Ancestors* (1953), 213-215.
[796] Morell, 155.
[797] Morell, 163-169. On Mau Mau, see Caroline Elkins, *Imperial Reckoning: The Untold Story of Britain's Gulag in Kenya* (New York: Henry Holt, 2005), and David Anderson, *Histories of the Hanged: The Dirty War in Kenya and the End of Empire* (New York: W.W. Norton, 2005).
[798] Morell, 158-159.

nearing retirement age and just wanted his past and ongoing research projects to be taken seriously, in *Adam's Ancestors* Leakey made the case for the continuing importance of his work, and the necessity of funding paleoanthropology and archaeology in African sites in the future. From a beginning marked by marginal academic posts and improbable accidental discoveries, East and South Africa had blossomed into arguably the most vibrant region in the world for paleoanthropology. Finding fossils as a part of a coordinated research program would be expensive, if it was going to be done right, but with the right story, getting money to research the tantalizing beginnings of the human species could be made significantly easier. Writing these narratives about African paleontology was essentially like grant-writing, on a very large indirect scale.

As the consensus around African origins solidified, the standard narrative of paleoanthropological history that emerged was largely created by Raymond Dart—hardly a disinterested narrator of his own career. It coalesced, however, at the same time as a new, very public reappraisal of Darwin's legacy, which was tied to the centennial celebrations of *On the Origin of Species*, held in 1959. The celebration was a critical moment for the solidification of a triumphant story of how science was continuing to prove Darwin "right," on both the African origins of humanity and evolution in general. In this moment, the logic of looking for human ancestors was naturalized, creating a smooth historical line between the theory proposed by Darwin and the proof (variably defined) that had been provided first by Dart, and continued by Leakey, Broom, and other researchers.

Paleoanthropologist Ian Tattersall has condemned the efforts of Ernst Mayr and other biologists to prune the proliferating species and genera and linearize hominin evolution in 1950,

arguing that this denial of taxonomic "bushiness" delayed critical realizations in the field.[799] Without adjudicating Tattersall's counterfactual claims, the similarity is striking between the ways that the hominin lineage was streamlined in the 1950s and the ways that practitioners also attempted to simplify the historical narrative of how paleoanthropologists came to believe the cradle of humankind was in Africa. By the end of the 1950s, the African origins hypothesis appeared nearly total, so much so that at least in Europe and North America, the Asian origins hypothesis seemed to fade out of existence.

In November 1959, the University of Chicago hosted a five-day celebration to commemorate the centennial of the publication of Darwin's *Origin of Species*. The event featured a series of panel discussions on evolution given by a collection of international experts in the field, who were also asked to contribute papers on various topics for a commemorative volume. *The Evolution of Man*, published in 1960 and edited by anthropologist Sol Tax, was the second of three volumes that came out of the University of Chicago Centennial.[800] In a paper titled "The Origin of the Genus *Homo*," Louis Leakey began: "Darwin believed that the most likely continent in which to search for evidence of human evolution was Africa."[801] Eighty-eight years after Darwin had proposed the African origins of humankind in *Descent of Man*, his

[799] Tattersall, *Case of the Rickety Cossack*, 213-221. Interestingly, an article on Olduvai fossil finds from 1966 even uses the phrase "Man's family bush" to caption a sketch of hominin fossil relationships. See John Davy, Ian Berry, and Maurice Wilson, "The Search for the Origins of Man," *The Observer* (January 23, 1966), 20. (Mss Add.7959, box 4. Cambridge University Library.)

[800] Sol Tax, ed. *Evolution After Darwin*, vol. 1: *The Evolution of Life: Its Origin, History, and Future* (Chicago: University of Chicago Press, 1960); Sol Tax, ed. *Evolution After Darwin*, vol. 2: *The Evolution of Man: Man, Culture, and Society* (Chicago: University of Chicago Press, 1960); Sol Tax and Charles Callender, eds. *Evolution After Darwin*, vol. 3: *Issues in Evolution: The University of Chicago Centennial Discussions* (Chicago: University of Chicago Press, 1960). See also Vassiliki Betty Smocovitis, "The 1959 Darwin Centennial Celebration in America," *Osiris* 14, Commemorative Practices in Science: Historical Perspectives on the Politics of Collective Memory (1999), 274-323.

[801] L.S.B. Leakey, "The Origin of the Genus *Homo*," in *Evolution After Darwin*, ed. Sol Tax, vol. 2, *The Evolution of Man: Man, Culture, and Society* (Chicago: University of Chicago Press, 1960), 17.

"tentative suggestion" had been "more than substantiated by fossil evidence" from a series of very ancient geological periods.[802]

In fact, the fossil evidence had recently increased. In July 1959, Mary Leakey had unearthed a skull in Olduvai Gorge in Tanzania of a type that she and Louis ultimately classified as a robust *Australopithcus*, although they originally had given it the designation *Zinjanthropus boisei*, and the nickname "Nutcracker Man" or "Dear Boy."[803] The *New York Times* reported in early September 1959 that the skull was "the link between man and the South African ape man," and believed to be the oldest skull ever discovered that had belonged to a tool-making culture, since the fossil had been found in association with the fragments of a "primitive stone culture called Oldowan."[804] In the article, Louis was quoted as saying that the find was "a convincing piece of evidence of the truth of Darwin's view that man and apes evolved from common stock." The Darwin centennial was the perfect opportunity for connecting the dots between the great man's theories and the fossil evidence. The Africa-focused paleoanthropologists now emerged as explorers who had been following closely in Darwin's footsteps from the outset, creating a smooth historical through-line on the African origins of humanity that stretched from 1871 to 1959.

Reciprocally, Darwin's theories became even more credible because they had been substantiated by results in the field. Certainly, not everything Darwin had ever proposed was deemed to be worthy of intellectual resurrection in 1959 – the role of sexual selection in evolution, for instance, had a similar triumphalist "Darwin was right!" moment, but not until a

[802] Leakey, "The Origin of the Genus *Homo*," 30.
[803] Morell, 185-195.
[804] "Finder Says Fossil Links Ape and Man," *The New York Times*, September 4, 1959.

decade later, in the early 1970s.[805] The fact that Darwin was "right" about the origins of humanity, however, was important to emphasize and reiterate to the members of the public who formed most the target audience of the 1959 celebrations.[806] This was especially the case for the American scientists who were organizing the event, and wanted to pre-empt political interference or overtly negative publicity from anti-evolutionists in the United States.[807]

[805] This is a simplification; see Erika Lorraine Milam, *Looking for a Few Good Males: Female Choice in Evolutionary Biology* (Baltimore: The Johns Hopkins University Press, 2010).
[806] Smocovitis, "The 1959 Darwin Centennial Celebration," 293-299.
[807] Smocovitis, 293-294. The Scopes Monkey Trial appeared to be very much on the minds of the many of the celebration's organizers.



Mrs. Leakey holds the fossil she found on the slope of Olduvai Gorge. Dr. Leakey points to the upper teeth and palate, which through the ages slowly turned to stone as minerals replaced bone and dentine.

Dr. Leakey considers his man a bridge between *Australopithecus*, the extinct near-man of South Africa, and *Homo sapiens*, today's universal species (skull at left). Though *Zinjanthropus* probably did not know the use of fire, he shared modern man's ability to make tools according to a predetermined pattern.

Massive molars set the discovery apart from modern man (palate below) and even the gorilla. They indicate his diet was mainly vegetarian. Small canines and incisors resemble those of present-day man. The lack of tusklike eyeteeth strongly implies that he did not rely on biting for battle or for skinning animals. In compensation, he made cutting tools.

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DES BARTLETT, ARMAND DENIS PRODUCTIONS

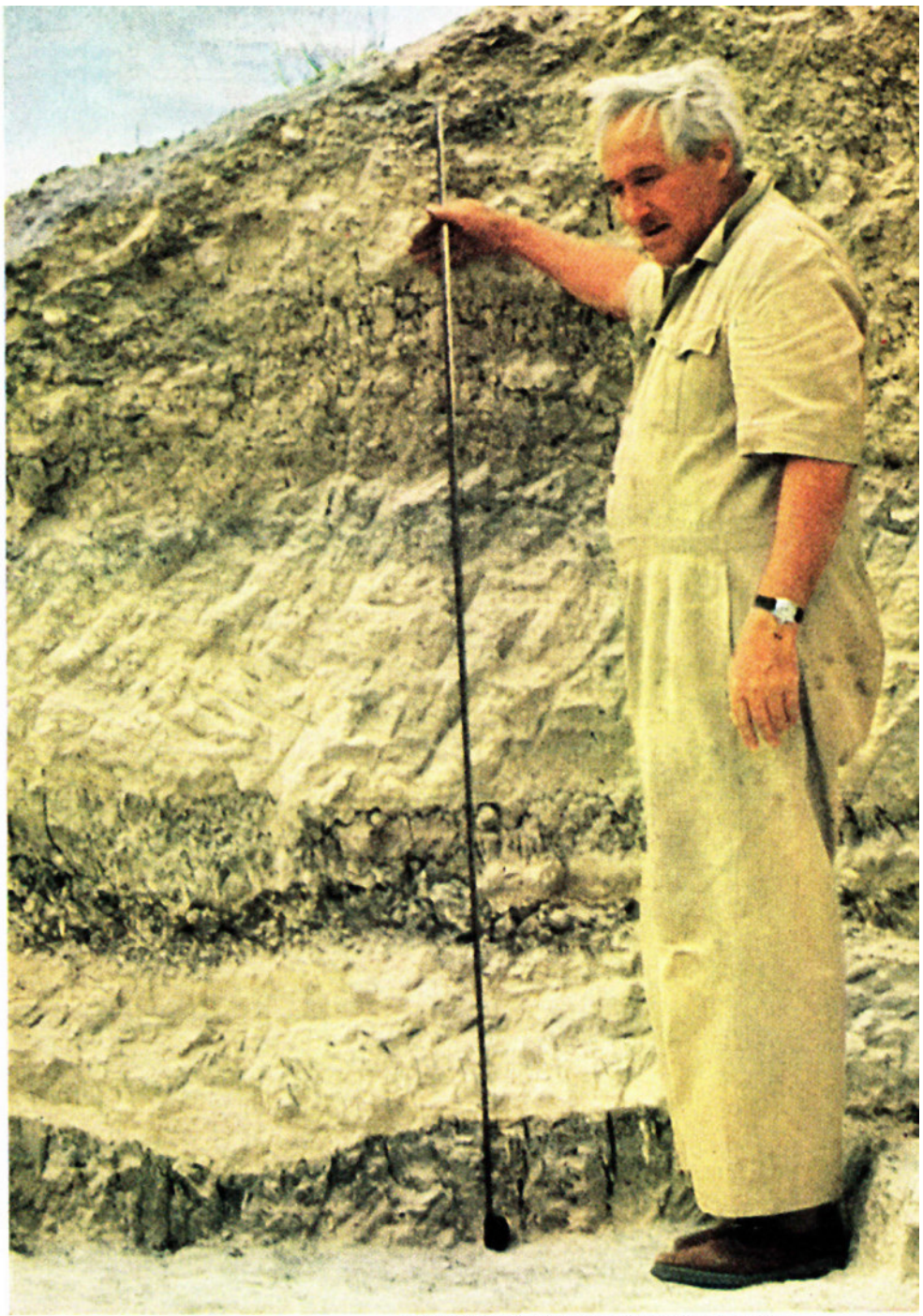
Figure 25 Mary Leakey and Louis Leakey show off "Zinj" in Des Bartlett and Louis S.B. Leakey, "Finding the World's Earliest Man," *National Geographic Magazine* 118, no. 3 (September 1960), 430.

The history related at the Darwin celebrations in 1959 has now become the standard narrative used by both paleoanthropologists and journalists to introduce the historical background to new discoveries in African paleoanthropology to this day. By 1960, it might easily appear to a newcomer to the field that the Asian origins hypothesis had never really existed or been taken seriously at all.

An East African Eden and the World's Earliest Man

In his article for *National Geographic* in September 1960, titled "Finding the World's Earliest Man," Leakey described the initial, marvelous discovery of the fossilized teeth of *Zinjanthropus* projecting from a rock face in Olduvai Gorge, and the months of painstaking excavating, sifting, and sorting that had enabled them to piece together an almost complete cranium of the early hominin, including most of the teeth in the upper jaw.[808] (Only the lower jaw remained missing.) While the fossil still awaited thorough morphological analysis from a trained anatomist, Leakey wrote with his usual bravura confidence that he was entirely certain *Zinjanthropus* was in the human ancestral line, much closer in relation to *Homo* than the "near-men" Australopithecines from South Africa.

[808] Des Bartlett and Louis S.B. Leakey, "Finding the World's Earliest Man," *National Geographic Magazine* 118, no. 3 (September 1960), 420-435.



DES BARTLETT, ARMAND DENIS PRODUCTIONS

Six-foot measure in hand, the author stands with feet beside the dark layer that entombed earliest man.

Figure 26 Louis Leakey in Olduvai, showing the stratigraphic layers, in Des Bartlett and Louis S.B. Leakey, "Finding the World's Earliest Man," *National Geographic Magazine* 118, no. 3 (September 1960), 425.

Due to Olduvai's "layer cake" stacks of geological strata, and the unambiguous position of *Zinj* in one of those strata, it was not difficult to establish a correlation with other fossils and to use those data to establish a relative age for the find. Leakey wrote that he had long suspected that Olduvai held evidence of human life "earlier than that represented by Peking Man or Java Man," and the index fossils proved it. *Zinj* had been found in the same strata that held fossilized bones of *Afrochoerus* (a type of giant prehistoric pig) and *Pelorovis* (a gigantic type of sheep):

> These animals and many others roamed the earth during the Lower and Middle Pleistocene periods, roughly between 600,000 and 200,000 years ago. Others found in the levels that yield Zinjanthropus, but not higher up, help prove that our fossil man belonged to the Lower Pleistocene and not to the more recent Middle Pleistocene.[809]

Because the upper teeth were so small (and anatomically very similar to those of *Homo sapiens*), Leakey inferred that *Zinj* must have been a tool-maker—not the least because it was difficult to imagine how *Zinj* would be able to hunt and kill meat successfully without them, since his little human teeth were so inadequate to the task.[810] (Leakey had proved this for himself by attempting to kill and skin a rabbit using only his teeth and fingernails, and found the task impossible.) The Leakeys had been finding basic stone tools in the gorge for as long as they had been excavating; now it appeared that they had the remains of one of the people who had made and used them.[811]

Between 1958 and 1960, the Leakey team had carefully collected samples of volcanic tuff (ash deposits) and basalt lava flows from different strata in Olduvai Gorge. The materials were sent to Berkeley, where two young geophysicists, J.F. Evernden and G.H. Curtis, were interested in applying another new radiometric technique, potassium-argon (K/Ar) dating, which

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[809] Bartlett and Leakey, "Finding the World's Earliest Man," 434.
[810] Bartlett and Leakey, "Finding the World's Earliest Man," 433. Leakey had no trouble
[811] The fact that the tool culture was called the "Oldowan," using the prewar spelling of "Olduvai," is indicative of how long ago the Leakeys had begun finding the worked stones. Oldowan began to displace Wayland's "Kafuan culture" designation around this time, as it began to be recognized that the two cultures were essentially the same.

measured the decay ratio of potassium-40 into argon-40 to estimate the age of specific types of volcanic deposits—of which there were many in and around the Olduvai area.[812] Like radiocarbon, the potassium-argon decay series had first come to the attention of scientists researching naturally-occurring radioactivity, and then continued to be a subject of study for researchers investigating the α, β, and γ emission series for different isotopes. In the potassium-argon decay series, ^{40}K becomes ^{40}Ar via electron capture, meaning a proton turns into a neutron, spitting out an electron neutrino. The atomic number drops by one ($K_{19} \rightarrow Ar_{18}$) but the neutron number goes up by one, so the mass number stays the same ($^{40}K \rightarrow ^{40}Ar$). ^{40}Ar is gaseous and then recrystallizes in the rock as it cools; measuring the ratio of ^{40}K to ^{40}Ar allows an observer to calculate the amount of time that has passed since the rock formed.[813] Since the hominin-bearing strata were bracketed by veins of volcanic material, potassium-argon was potentially perfect for establishing absolute dates for some of the layers at Olduvai.

In 1960, Leakey estimated that *Zinj* was roughly 600,000 years old—an early Pleistocene date that made it easily the earliest tool-using hominin ever found. In the summer of 1961, he joined Evernden and Curtis to publish the results of their dating studies at Olduvai:

> The conclusion is inescapable that Oldowan culture and Villafranchian fauna are synchronous in time and that both are approximately 1.75 million years old.[814]

Zinjanthropus, by this measure, was indeed "the world's earliest man"—but fully three times older than even Leakey's most generous estimate. While some scientists questioned the validity of the comparison, or Leakey's sample-gathering technique, the complaints focused on whether

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[812] L.S.B. Leakey, J.F. Evernden, and G.H. Curtis, "Age of Bed I, Olduvai Gorge, Tanganyika," *Nature* 191, no. 4787 (July 29, 1961), 478-479.
[813] For an explanation with more technical details, see F.G. Houtermans, "History of the K/Ar-Method of Geochronology," in O.A. Schaeffer and J. Zähringer, *Potassium Argon Dating* (Heidelberg: Springer-Verlag, 1966), 1-6.
[814] Leakey, Evernden, and Curtin, "Age of Bed I," 479.

Zinjanthropus was truly 1.75 million years old—perhaps it was only 1.0 million years old.[815] All the other evidence for African origins still held, but the timeline available for human history and hominin evolution had expanded enormously.

In 1961, Leakey was invited to deliver the prestigious annual lecture in honor of Herbert Spencer at Oxford University, on the topic "The Progress of Man in Africa."[816] "A bare century ago," he began,

> Africa was thought of simply as the 'Dark Continent', the country where savagery reigned supreme, where tropical diseases were uncontrolled, and where progress was non-existent. Many of these ideas were still widely held as little as thirty years ago, although the prevailing ignorance about Africa was at last beginning to be dispelled.[817]

Today, however, Leakey continued, the advent of modern communication made ignorance of African affairs, culture, and geography far less excusable. If rude inquisitors asked him "What has Africa ever contributed to the world?", Leakey had a very good answer: humankind. "These critics of Africa," he wrote, "forget that men of science today are, with few exceptions, satisfied that Africa was the birth-place of man himself, and that for many hundreds of centuries thereafter, Africa was in the forefront of all world progress."

In a lecture that ranged from the antelope-butchering properties of simple Oldowan pebble-tools and the possibility of racial differentiation in the Pleistocene, to Kikuyu birth-

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[815] See G.H.R. von Koenigswald, W. Gentner, and H.J. Lippolt, "Age of the Basalt Flow at Olduvai, East Africa," *Nature* 192, no. 4804 (November 25, 1961), 720-721; and William L. Straus, Jr. and Charles B. Hunt, "Age of Zinjanthropus," *Science* 136, no. 3513 (April 27, 1962), 293-295. Subsequently, pumice samples from Bed I were measured by fission-track dating, which returned the result 2.03±0.28 million years, "in good agreement with the result obtained by the potassium-argon decay method." See R.L. Fleischer, P.B. Price, R.M. Walker and L.S.B. Leakey, "Fission-Track Dating of Bed I, Olduvai Gorge," *Science* 148, no. 3666 (April 2, 1965), 72-74.

[816] Louis Leakey, "The Progress of Man in Africa," in *The Progress and Evolution of Man in Africa* (London: Oxford University Press, 1961). The lecture opportunity came on the heels of a spectacular year of field discoveries by both Mary Leakey and Louis Leakey; their fossil bounty included two different types of hominin skulls, and the discovery of a complete hominin ankle and foot. See discussion in Morell, 211-212.

[817] Leakey, "Progress of Man," 1.

spacing customs and the viability of post-independence African democracy, Leakey repeatedly drove home the point that the great and dramatic advances that had formed *Homo sapiens* had all occurred in Africa. The evidence for this claim was very compelling, and had continued to grow in the years since the 1947 Pan-African Congress on Prehistory, and since Leakey had been involved or adjacent to the discovery of a large part of it, especially on the hominin fossil front, he was well-placed and well-practiced in making his interpretive case. In his Spencer lecture, he made only one brief reference to the fact that there had once been another theory—although, in a way, the fact that it was important to give an entire lecture making a strong case for Africa would seem to imply the existence of an alternative or prior theoretical claim. Leakey referred to the long-standing scientific conclusion that there must be some naturalistic alternative to the Biblical Creation, citing Darwin as one of the forefathers of this move. Darwin himself, he wrote, "with little to guide him except the present day distribution of the living great apes and the many old world monkeys," had suggested Africa as the cradle of humankind, but, Leakey continued, "until recently there have always been men of science who have inclined, rather, to the view that Asia was the probable cradle of the human race."[818] He immediately moved on to the announcement of *Australopithecus* in 1925, which "did much to swing the pendulum back in favor of Africa," and continued on with the lecture.

When readers of the British newspaper *The Guardian* opened their copies of *The Observer*, the paper's Sunday magazine supplement, on January 23, 1966, they discovered a portrait of one of their hominin ancestors on the front cover.[819] The drawing showed a very hairy small-headed figure with bright white human-like teeth against a lush green landscape; an ostrich

[818] Leakey, "Progress of Man," 2.
[819] John Davy, Ian Berry, and Maurice Wilson, "The Search for the Origins of Man," *The Observer* (January 23, 1966), 14-21.

ran out of the frame to the right, while a snow-topped mountain with an ominous plume of ash loomed to the left.[820] "The Search for the Origins of Man," written by John Davy and illustrated with photographs by Ian Berry and drawings by Maurice Wilson, brought the latest discoveries from the Leakey digs in Tanzania—"this prehistoric Eden"—to the minds and breakfast tables of the paper's British readership. Similarly to Leakey's *National Geographic* article from six years before, the piece described the ongoing research, the challenging arid climate and gorgeous landscape of Olduvai, and the remarkable pattern of fossil finds that were being excavated, largely under the leadership of Mary Leakey. On page twenty-one, there was a small photograph and short paragraph inset on the page, under the heading "A Dissident View." Wilfrid Le Gros Clark was quoted as disputing Leakey's claim that one of the new Olduvai finds, a specimen dubbed *Homo habilis*, or "Handy Man," was truly an example of *Homo*; Le Gros Clark thought the evidence suggested that Handy Man was only just another variety of Australopithecine, transported and marginally changed by its adaptation to the different climate of East Africa.[821] What is striking about this dissent is not that it was present—paleoanthropology was and remains a fractious discipline—but rather the way that conflict about interpretation had now become completely localized. There was enough material, and enough consensus to argue points of interpretation in hominin paleontology without reference to fossils found outside the African continent.

[820] The teeth are an important detail; part of what was interesting about *Zinjanthropus* and *Homo habilis* was how similar their dentition was to that of modern *Homo sapiens*. It was important to show the cover hominin with teeth that looked more human-like than ape-like.
[821] Davy, "The Search," 21.

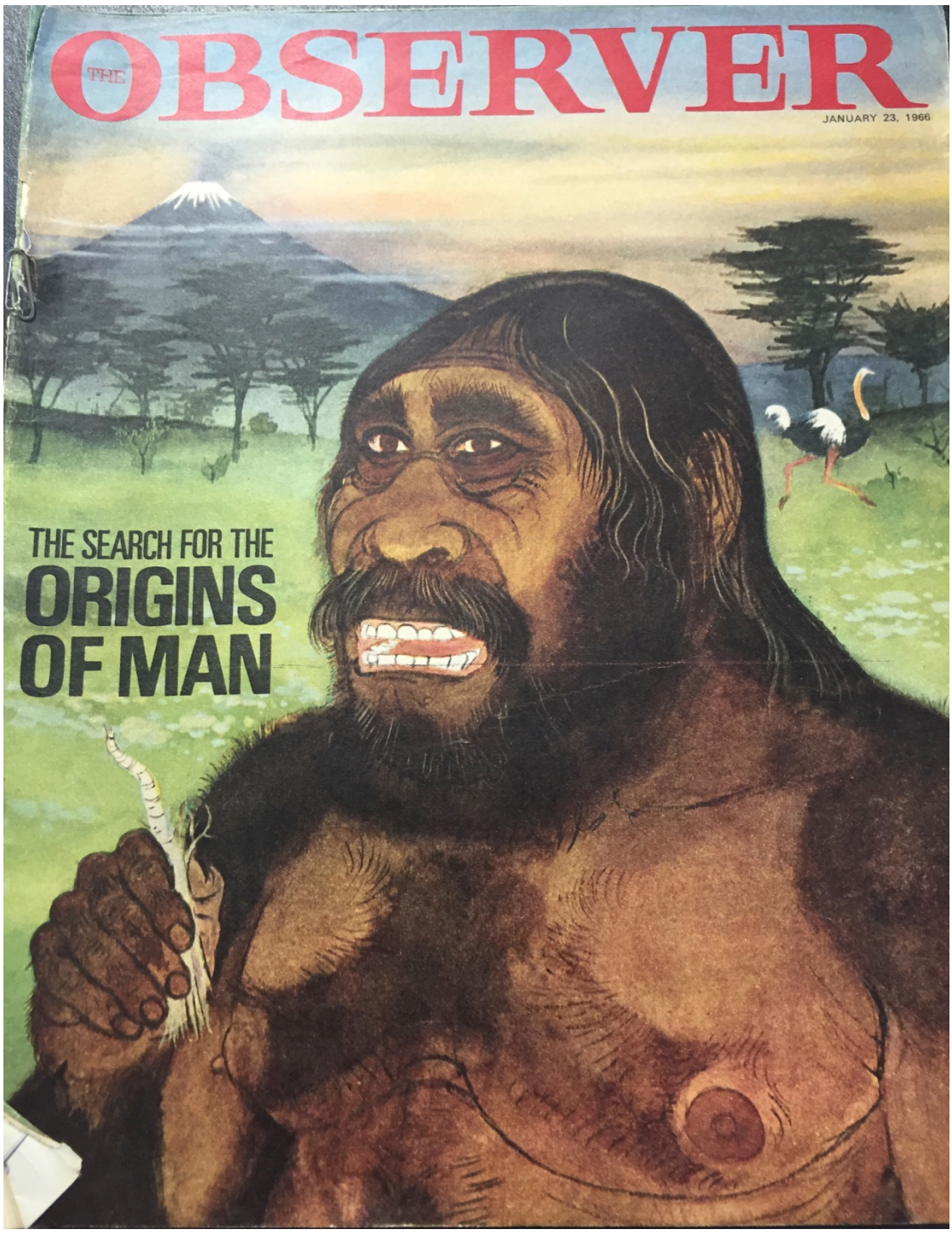


Figure 27 John Davy, Ian Berry, and Maurice Wilson, "The Search for the Origins of Man," *The Observer* (January 23, 1966), 14-21. Miles Crawford Burkitt collection, Cambridge University Library.

Historicizing Africa

In the same *National Geographic* that carried Leakey's *Zinjanthropus* story, the Society went to "unusual lengths," in the words of an editor, to bring the magazine's readers "a vivid picture of a continent in ferment."[822] The vivid picture was both figurative and literal—the issue included a special ten-color atlas-quality map of the continent, which included "new names, new capitals, new boundaries, new important places—symbols of freedom gained." In 1950, when the Society had last published a complete political map of the African continent, there had been only four sovereign nations shown—Ethiopia, Liberia, the Union of South Africa, and Egypt. By September 1960, the total had risen to twenty-five. The Society's chief cartographer James M. Darley even remarked that he had not had to make so many rapid changes to a map in production even during the heyday of changing battlefronts in World War II. The *Zinjanthropus* story was one of four in the issue devoted to African history, politics, economic development, and the natural world, creating a continuum that ran from the world's "earliest man" to the world's "newest countries."

[822] "New Portrait of Africa's Changing Face," *National Geographic Magazine* 118, no. 3 (September 1960), 360.

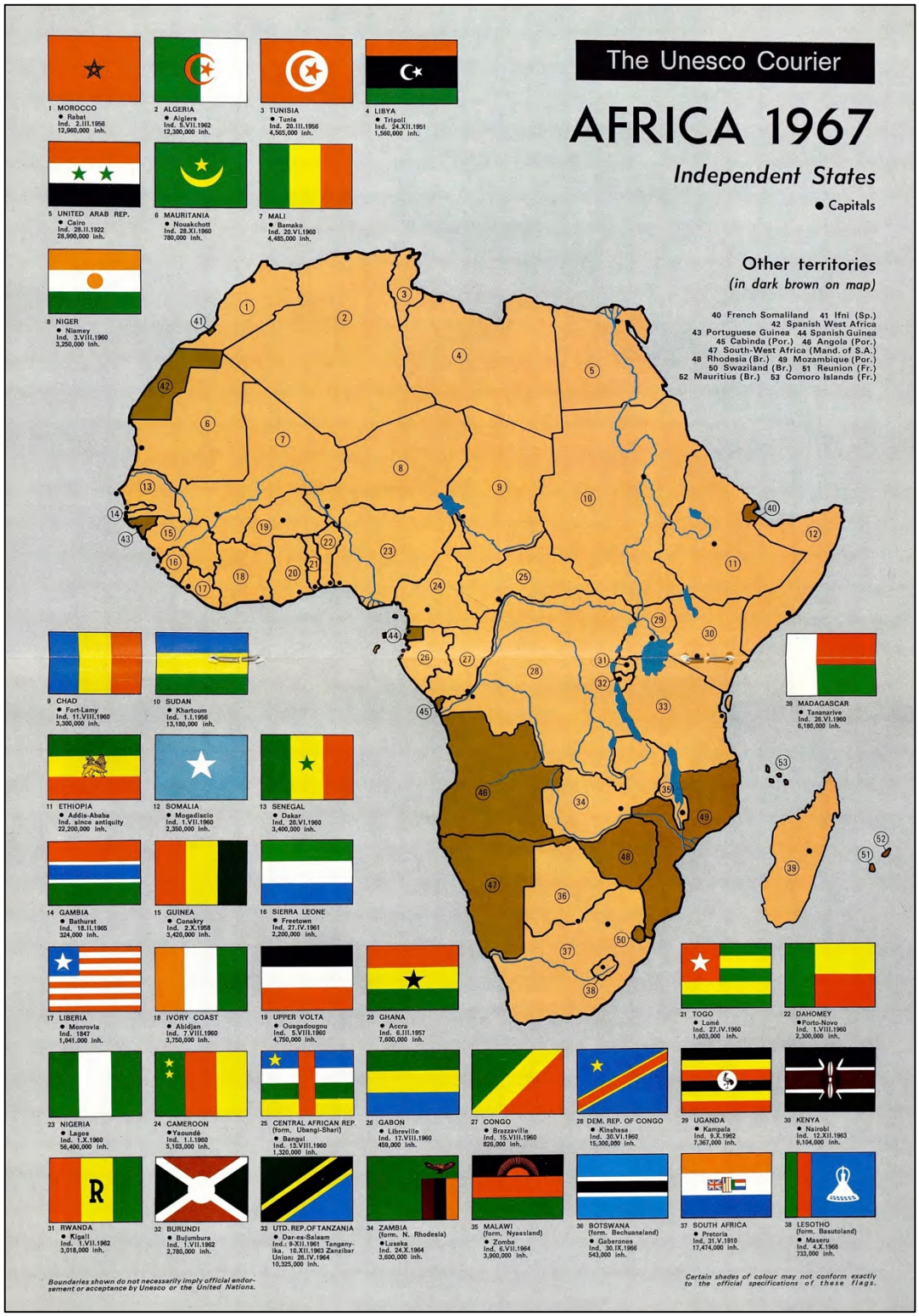


Figure 28 Map of independent African countries, *The UNESCO Courier* 20, no. 6 (June 1967).

Studying and making sense of this enormous change required new departments, disciplines, and histories. In the United States, the first program in African Studies was founded at Northwestern University in 1948, when programs in area studies were first beginning to appear on college campuses.[823] In the US State Department, for example, knowledge of Africa was virtually nil in 1945; providing federal funding for African studies was a way to create a pool of American regional expertise that could be usefully deployed to counter Communist influence, especially as more colonies appeared to be barreling towards independence.[824] Like Soviet studies and East Asian Studies, African Studies was also advanced by the creation of the Ford Foundation Foreign Area Scholarships in 1954, which funded dissertation work for a small but growing coterie of American scholars of African history, economics, political science, and anthropology.[825] The second growth stage of African studies in the United States took place in the 1960s; over the course of the decade, the number of academic Africa specialists in the US went from roughly 200 people in 1960 to 1,800 by 1970.[826] The lion's share of the growth was in historical studies, and in the joint category for linguistics, language, and literature, although the largest number of scholars, in both proportional and absolute terms, were concentrated in the

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[823] See Philip D. Curtin, "African Studies: A Personal Assessment," *African Studies Review* 14, no. 3 (December 1971), 357-368. Curtin dated the "Small Awakening" of US African studies in the 1950s to the founding of the African Studies Program at Northwestern University in 1948; 10 other programs were founded over the following decade. (See "African Studies in the United States," *African Studies Bulletin* 1, no. 1 (April 1958), 6-20.) See also Jane I. Guyer, *African Studies in the United States: A Perspective* (Atlanta: African Studies Association Press, 1996). On the history of area studies as an academic endeavor, see discussion in David C. Engerman, *Know Your Enemy: The Rise and Fall of America's Soviet Experts* (New York: Oxford University Press, 2009).

[824] See John Kent, "The United States and the Decolonization of Black Africa, 1945-63," in David Ryan and Victor Pungong, *The United States and Decolonization: Power and Freedom* (New York: St. Martin's Press, 2000), 168-187. See also Michael L. Krenn, *Black Diplomacy: African Americans and the State Department, 1945-1969* (Armonk, NY: M.E. Sharpe, 1999).

[825] See Curtin, "African Studies," and Philip D. Curtin, *On the Fringes of History: A Memoir* (Athens: Ohio University Press, 2005). Curtin's memoirs also make clear the extent to which African history was co-constituted with world history; at their inception in the 1960s, there was a tendency in both fields to take a capacious temporal and geographic scope, and to tell historical narratives on a very large scale.

[826] Curtin, "African Studies," 358-359.

non-historical social sciences (political science, anthropology, sociology, geography, economics, psychology, and demography).[827] In France, Britain, Germany, and the Soviet Union, there was a similar flourishing of African studies in the late 1950s and early 1960s.[828] In Britain and France, this dynamic was inseparable from the end of colonial rule, and establishing African history as an academic field required conscious maneuvering to set the new departments and discipline apart from the old colonial historiography.[829] In the Soviet Union, formal study of African politics and history began to appear in the early 1950s, and was formalized by the creation of an African Institute in the Department of Historical Science in the Soviet Academy of the Sciences in 1959.[830] New journals also appeared in the late 1950s: in the United States, the *African Studies*

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[827] Curtin, "African Studies," 359.

[828] On France, see Catherine Coquery-Vidrovitch, "Changes in African Historical Studies in France," in Christopher Fyfe, ed. *African Studies since 1945: A Tribute to Basil Davidson* (London: Longman, 1976), 200-208, and Sophie Dulucq, *Écrire l'histoire de l'Afrique à l'époque coloniale (XIX^e – XX^e siècles)* (Paris: Éditions Karthala, 2009), 257-280. Dulucq's key point is that there was a growing distinction drawn from about 1960 onwards between "history of Africa" on one hand and "colonial history (in Africa)" on the other, with the latter rapidly losing ground to the former. On Britain, see Ebiegberi Joe Alagoa, *The Practice of Historiography in Africa: A History of African Historiography* (Port Harcourt, Nigeria: Onyoma Research Publications, 2006), 177-185, and Christopher Fyfe, ed. *African Studies since 1945: A Tribute to Basil Davidson* (London: Longman, 1976). On Germany, see Imanuel Geiss, "The Study of African History in Germany," in Fyfe, ed. *African Studies since 1945*, 209-219, and Peter Probst, "Betwixt and Between: An Anthropologist's Perspective on the History of African Studies in Germany," *Africa Spectrum* 40, no 3 (2005), 403-427. Geiss emphasizes the total break between pre-war and post-war African studies in Germany, and argues that the field took completely different paths in West and East Germany. Probst focuses on the long historical continuity from late-nineteenth century colonial studies of Africa to the interwar, National Socialist, and postwar academic and amateur German engagement with the history, politics, and cultures of the continent. Probst places the "social science-ing" of (West) German African studies in the late 1960s, rather than the late 1950s.

[829] K. Onwuka Dike noted that the University of London had initially been extremely skeptical about the value of creating a degree course in African History, and a chair in the field was not established until 1963. See K. Onwuka Dike, "The Scientific Study of Africa's History," *The UNESCO Courier* 20, no. 6 (June 1967), 10.

[830] See Dike, 10. Soviet scholarly work incorporated in African studies was weighted towards contemporary social scientific concerns; the editorial board of the 1968 Annual *Africa in Soviet Studies* described the emphasis of Soviet scholarship as being "national-liberation movements, economic activity, social, political, and cultural development, and the social thinking of the African countries, as well as the ethnography, history, art, literature and linguistics of the African nations, as interpreted by Soviet scholars proceeding in their studies from the Marxist-Leninist concepts of unity of the process of world history." See USSR Academy of Sciences Africa Institute, *Africa in Soviet Studies* 1968 Annual, trans. Igor Gavrilov (Moscow: Nauka Publishing House Central Department of Oriental Literature, 1969), 5. The

Bulletin began publication in 1958, while in Britain the *Journal of African History* first appeared in 1960.[831]

In 1965, UNESCO announced a ten-year program to research and write a "General History of Africa," with Professor K. Onwuka Dike of the University of Ibadan, Nigeria, as Scientific Director.[832] Unlike the *Scientific and Cultural History of* Mankind, the *UNESCO General History of Africa* has been hailed as a major landmark in the historiography of the continent, on par with (or possibly superior to) the Cambridge History of Africa published between 1975 and 1986.[833] In a piece on African history and the UNESCO General History project, Dike noted the irony that, while many pieces of textual historical evidence from the African continent antedated the common era, "African History" as an academic subject was almost entirely a post-World War II development.[834] Part of the project of this UNESCO history was to fill in the spaces between the most ancient textual sources and the present day, but Dike also emphasized the "vast untapped source material" that had been neglected by colonialist historians of Africa who had "equated written documents with history."[835] Without written

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1968 Annual was the first one published, and incorporated Soviet scholarship on Africa from the period 1966-1968.

[831] See front matter in R.A. Oliver and J.D. Fage, eds. *The Journal of African History* 1, no. 1 (1960) and front matter in *African Studies Bulletin* 1, no. 1 (April 1958). The *African Studies Bulletin* became the *African Studies Review* in 1970; it is still published by the African Studies Association in the United States. The inaugural editorial board of the *Journal of African History* included Eric Axelson (Wits), Philip Curtin (Wisconsin), W.B. Fagg (British Museum), P.N.S. Mansergh (Cambridge), R. Mauny (IFAN, Dakar), J. Desmond Clark (Livingstone Museum, Rhodesia), Kenneth Onwuka Dike (Ibadan), Ch.-André Julien (Sorbonne & Rabat), G. Mathew (Oxford), and J. Stengers (Université Libre, Brussels).

[832] K. Onwuka Dike, "The Scientific Study of Africa's History," *The UNESCO Courier* 20, no. 6 (June 1967), 9. The cover headline for the issue was "Africa and the African Genius."

[833] See Ebiegberi Joe Alagoa, *The Practice of Historiography in Africa: A History of African Historiography* (Port Harcourt, Nigeria: Onyoma Research Publications, 2006), 208. Alagoa rated the UNESCO *History of Africa* more highly than the Cambridge production for its "greater will to speak from an African focus, and, as far as practicable, in an African voice."

[834] Dike, 9-13.

[835] Dike, 10.

documents, the logic went, could a people or a region or a civilization even be said to have a history? Dike wrote:

> Under the colonial regimes, this view of history flourished in Africa. It bolstered up the colonial ruler's propaganda that the African had no history worthy of record and that the history of the European rulers constituted the sum total of African history.[836]

Dike emphasized that there were, in fact, significant textual archives of African history, including large collections of Swahili and Hausa material recorded in Arabic script, as well as numerous documents remaining in private hands all around West Africa.[837] Similarly, in the age of "microfilm and the zerox [sic] process," it was absolutely possible to re-consolidate the archives of empire in the countries where they had originally been created, rather than letting documents molder in dispersed imperial capitals.[838]

However, fully understanding the African past also required the study of non-textual sources, Dike argued—especially when writing the history of the pre-colonial period.[839] African historians needed collaborations with other disciplines and make use of evidence drawn from many sources, including linguistics, anthropology, art history, and archaeology. This was a large project, and "much credit is due to the well-seasoned and understanding Africanists of the United States, Europe, and the Soviet Union," wrote Dike.[840] However, "the problems posed by African history are largely African," he concluded, "and therefore demand an African solution." In the first decade of independence, this African solution seemed to be on good footing. The First

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[836] Dike, 10.
[837] Dike, 11.
[838] Dike, 11.
[839] Oral history began to be a major component of Africanist historical practice in the 1960s, following the publication of Jan Vansina's *Oral Tradition: A Study of Historical Methodology*, trans. H.M. Wright (Chicago: Aldine Pub. Co., 1965) in English. (It was first released in French in 1961.) See Alagoa, 183.
[840] Dike, 13.

International Congress of Africanists met in Accra in 1962, while major historiographic schools developed at Ibadan, Nairobi, and Dar Es-Salaam in the 1960s.[841]

In his presidential address to the first annual meeting of the African Studies Association, American anthropologist Melville J. Herskovits argued that one of the most significant results of the introduction of new methods and approaches in African history was the realization that Africa had been integrated into trans-continental flows of resources and culture since long before the advent of European colonial rule. "We are learning," he wrote:

> …that Africa was an integral part of the Old World, that it was culturally a donor as well as a recipient; in short, that it played a full role in the drama of the development of human civilization in general, and of that particular division of it which we associate with the Old World—Africa, Asia, and Europe.[842]

The evidence of prehistory had helped to correct misguided international perspectives on the place of Africa in the long narrative of human history, for example by demonstrating that the development of stone tools in Africa predated the same cultural practices in Europe by "some hundred thousand years."[843] Herskovits also acknowledged that those pre-existing historical narratives had initially determined how certain paleontological and archaeological finds were interpreted:

> The important paleoanthropological finds of Australopithecinae in southern Africa were relegated to the background in considerations of human evolution because it could

[841] See Alagoa, 185-210, and Dike, 12. The international center of gravity in African history remained in Africa at least through the 1970s, before, in Fred Cooper's words, the intellectual vitality of the field in Africa was sapped through successive financial and political shocks, including oil crises, structural adjustment, civil conflict, and the emergence of repressive regimes in the same countries that had supported vibrant universities and lively cultures of public debate. See Frederick Cooper, "Africa's Pasts and Africa's Historians," *African Sociological Review/Revue Africaine de Sociologie* 3, no. 2 (1999), 1-29.
[842] Melville J. Herskovits, "Some Thoughts on American Research in Africa," *African Studies Bulletin* 1, no. 2 (November 1958), 3.
[843] Herskovits, "Some Thoughts," 3.

> scarcely be admitted that Africa could have cradled the human race. Emphasis was therefore laid on India, China, and Java.[844]

The attitudes and beliefs held by Europeans about Africa had correspondingly had an enormous effect on policy-making and the practices of colonial rule, which had in turn "affected the course of African history and the lives of African peoples." The changing fortunes of the scientific evidence for African origins were reciprocally linked to the changing position of Africa in a universal narrative of world history. In Herskovits' telling, where scientific evidence had once been dismissed out of hand because historical narratives made it seem unlikely or impossible, now scientific evidence was being used to rewrite historical narratives.

Paleoanthropology and archaeology were valuable resources for Africanist historians, and they made the most of the material that was available. Reviewers celebrated and anticipated this move; in a review of Roland Oliver and John Fage's 1963 *A Short History of Africa*, Daniel McCall criticized the two historians for not giving a fuller and more detailed account of the hominin fossil finds and human evolution.[845] McCall nonetheless saluted the authors for their book, which he described as "the best single work to offer a student or a layman as an introduction to the subject." In their text, Oliver and Fage introduced the African origins hypothesis by writing:

> In *pre*-historic times – at least through all the long millennia of the Paleolithic or 'Old Stone Age' – Africa was not even relatively backward: it was in the lead. Archaeologists today are increasingly sure that it was in Africa that man's ancestors became differentiated from the other primates.[846]

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[844] Herskovits, "Some Thoughts," 4.
[845] Daniel F. McCall, review of *A Short History of Africa* by Roland Oliver and John D. Fage, *American Anthropologist*, new series 65, no. 3, part 1 (June 1963), 711.
[846] Roland Oliver and J.D. Fage, *A Short History of Africa* (New York: NYU Press, 1963), 14. Italics in the original.

The historical *longue durée* made the Eurocentrism of the imperial histories look short-sighted and silly, a historical aberration against a long narrative sweep of African engagement and contributions to world-historical processes, beginning from the emergence of the human species.

Beginning with *Old Africa Rediscovered* in 1958, British historian Basil Davidson became one of the best-known and best-selling historians of Africa of the 1960s.[847] A lucid, elegant writer with anti-colonial politics and a war service record that included fighting Fascist forces in Yugoslavia, Davidson was committed to producing compelling, highly readable narratives that destabilized Eurocentric narratives of imperial history and made Africa's rich history of pre-colonial civilization accessible to bigger audiences.[848] Setting the scene for his main focus in *Old Africa* required shedding light on events even farther back in the past, wrote Davidson: "What can be said, if anything, about the remote beginnings of mankind in Africa—about the earliest men or manlike creatures of the dawn of prehistory?"[849]

Manlike apes had lived in Africa over a million years prior to the present day, although Davidson noted for his readers that the "missing link" between the common ancestors of apes and humans had yet to be identified definitively, although there were a few plausible candidates that "in Professor Raymond Dart's illuminating phrase … 'trembled on the brink of

[847] Basil Davidson, *Old Africa Rediscovered* (London: Victor Gollancz Ltd., 1958).
[848] On Basil Davidson's biography, scholarship, and politics, see: Allen Isaacman, "Legacies of Engagement: Scholarship Informed by Political Commitment," *African Studies Review* 46, no. 1 (April 2003), 1-41; Barry Munslow, "Basil Davidson and Africa: A Biographical Essay," *Race and Class* 36, no. 2 (1994), 1-17; Stephen Howe, "The Interpreter: Basil Davidson as Public Intellectual," *Race and Class* 36, no. 2 (1994), 19-43; "News and Views: Basil Davidson, The White Man Who May Be the World's Most Accomplished Africanist," *The Journal of Blacks in Higher Education* 22 (Winter 1998-1999), 29; and Robin Derricourt, *Inventing Africa: History, Archaeology, and Ideas* (New York: Pluto Press, 2011), 120-136.
[849] Basil Davidson, *Old Africa Rediscovered*, fifth printing (London: Victor Gollancz Ltd., 1965), 26.

humanity'."[850] "That Africa may hold the answer to the earliest development of man himself," wrote Davidson, is also suggested by evidence from East Africa."

> Finds in East Africa, mainly in Uganda and Kenya, not only include the earliest evidence yet available of *Homo sapiens*, thus leading to a claim by some anthropologists, so far not denied, that Africa was the cradle of humanity…[851]

Davidson then continued:

> The foundations were securely laid, the successfully adaptable human type was firmly fixed. Thereafter it has remained for humanity to develop the potentialities within itself: to migrate and multiply and populate the earth.[852]

Given his wide readership, it's likely that Davidson was the first place that many people encountered the African origins concept in a work of historical scholarship. Whether through historical work, or through scientific journalism, the idea of the African cradle of humankind was percolating through diverse populations around the world, and slowly becoming a popular scientific fact that was generally known.[853] The scientific texts might have made a passing reference to the Asian hypothesis, largely to explain why the early work of African paleoanthropologists was not taken seriously (without having to explain or admit that there had been perfectly good reasons to doubt the talent or credibility of a young Leakey or Dart). The historical texts did not.

Conclusion

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[850] Davidson, 26.
[851] Davidson, 26-27.
[852] Davidson, 28.
[853] Anecdotally: in my entire time on this project, I've only twice had someone tell me they've never heard of the African origins hypothesis; only once has someone told me she had previously heard of the Asian origins hypothesis. (This person, another historian of science, had just been reading genetics textbooks from the 1960s for her own research, and found a reference there.)

In the history of African paleoanthropology told by paleoanthropologists, geologists, and archaeologists in the 1950s, "out of Africa" was the end of the story, the correct answer newly-found (or returned-to and redeemed, if the story started with Darwin as the African origins visionary). For the Africanist historians, the African origins of humanity were the very beginning of the story. There was no need to trace the intellectual history of the location of the cradle of humankind to tell the story of African origins. Humanity had begun in Africa, which made the continent immensely important in the long run and justified a new historiographical approach for writing about Africa's long past while looking ahead to its bright, independent future.

The total disappearance of the Asian origins hypothesis from popular culture can be traced to the narratives produced by paleoanthropologists and science journalists, and reproduced in natural history museums around the world. But it was enormously amplified by decolonization and the reconceptualization of independent Africa's place in the world that took place in the 1960s.

Davidson, Herskovits, Oliver and Gage, and many others wrote new histories of Africa in that decade for a variety of reasons, but they repeatedly returned to the paleoanthropological evidence of the fossil hominins as a historical starting point, grounding their narratives in a moment of undeniable and overwhelming African importance. In the subsequent half-century of historiography, this move has not gone away: John Iliffe's seminal *Africans: The History of a Continent* (1995) opens by stating that African history connects "the earliest human beings to their living descendants in a single story," while John Reader's *Africa: A Biography of the Continent* (1999) goes one step further and begins with the geological history of Africa before moving to dinosaurs and mammalian evolution (including primates) in chapter two.[854] The

[854] John Iliffe, *Africans: The History of a Continent* (Cambridge: Cambridge University Press, 1995), and John Reader, *Africa: A Biography of a Continent*, first US edition (New York: Vintage Books, 1999).

methodological merits of this move are complex, and were not made unwittingly; many of these authors engage very explicitly with their methodological practices and evidentiary commitments. Additionally, many practitioners of African history remain deeply committed to methodologies that incorporate oral history and non-textual sources, including archaeological evidence; at least in part, this commitment has been furthered by the unfortunate durability of the "Africa has no history before European colonialism" attitude.[855] In highlighting the position of hominin fossil evidence within this historiography, the goal is not to critique the use of non-textual sources in history writing, or the implications of writing history in a long temporal perspective, but rather to call attention to the "extra objective" status that certain kinds of scientific knowledge are sometimes granted in this scenario—and to show the implications of this methodology for how we understand the intellectual and cultural history of the out of Africa hypothesis.

The point here is that the work of these authors—widely read by audiences who may have become aware of paleoanthropology only recently or had little knowledge of the scientific developments—disconnected the African origins hypothesis from its intellectual history, and the theory's shadow-twin, the Asian origins hypothesis, increasingly vanished from public memory. Shorn of disputes, history, and scientific context, this deployment made African origins into an obvious and ahistorical scientific fact.

This is not to imply that Africanist historiography has been static during the last fifty years. In very broad terms, the large-scale histories of the 1960s gave way to detailed economic studies and the rise of labor history in the 1970s, followed by a social-cultural turn in the 1990s, along with growing attention to environmental histories of the African landscape. See discussion in Jane I. Guyer, *African Studies in the United States: A Perspective* (Atlanta: African Studies Association Press, 1996).

[855] See discussion in Alagoa, 188-210.

CONCLUSION
THE ORIGINS OF MAN IN 1965

In early April of 1965, over one hundred and twenty anthropologists, paleoanthropologists, primatologists, and other experts in the evolutionary development of humanity gathered at the University of Chicago for a three-day symposium on the topic "The Origin of Man." Sponsored by the Wenner Gren Foundation for Anthropological Research, the workshop participants presented papers on topics that included the recent growth in the body of African fossil evidence, the value of studying ape behavior to understand human evolution and the animal-human boundary, and on the evolutionary origins of language.[856] All these topics had featured in discourses on human evolution in the nineteenth century. As they circled back into the scientific purview, however, each topic was anchored in a body of data gathered on the African continent.

Symposium convenor and Chicago anthropology professor Sol Tax took the podium on the first day to welcome the participants and to sketch out the major contours of the planned discussions. One motivating factor for the holding the symposium was the presence of Louis Leakey in the United States for a lecture tour. But, Tax emphasized, "It seems to me that the major new material does not consist alone of the new fossils which have been uncovered in Olduvai Gorge."[857] Other important developments included the new dating techniques, which had pushed back the first appearance of humans by nearly one million years, and the studies of living primates—"chimpanzees, baboons, and the like"—had advanced so rapidly in the six

[856] Paul L. DeVore, ed. "The Origin of Man: Transcript of a Symposium Sponsored by the Wenner-Gren Foundation for Anthropological Research, Inc., Convened by Sol Tax, Held at the University of Chicago, April 2-4, 1965," (New York: The Wenner-Gren Foundation, 1965). The conference proceedings were recorded on 19,200 inches of magnetic tape, which was then fully transcribed and edited by DeVore.
[857] Tax, "Introduction to the Symposium," in DeVore, "The Origin of Man," 1.

years since the Darwin centennial that scientists had had to completely reconsider their interpretations of the ecology and social behavior of "early man." In addition, Tax noted:

> It appears that there are some new developments in the field of linguistics that might make possible some interpretations relevant to the origin of man's language. And since man could hardly be defined except in terms of culture, and culture except in terms of language, this is indeed relevant.[858]

The goal was to remain focused on the origin of humans; not the entire path of hominin evolution, but the transition point. And here, language and culture, approached through the pathway of studies of animal behavior, re-emerged as relevant to understanding how humankind began.

Louis Leakey was the first speaker on the docket. "Theories are always desirable," he said, "but a certain number of them in recent years have been dressed up and have started to masquerade as facts, when they are not facts at all."[859] Many of these theories coalesced around what the exact nature of the divide between ancestral proto-human and proper human really was. Bipedalism seemed to be important, and early—*Australopithecus* was quite possibly bipedal, which suggested an upright stance was a necessary but not sufficient boundary. "Then, too," continued Leakey, "we have a theory—a nice theory once—that *Homo* starts with a brain size of 'so many' cc. as a sort of Rubicon," although he pointed out that brain size on its own was less important than brain size relative to body size.[860] Another theory was that the defining characteristic of human-ness was tool-making—Man the Tool-Maker, as he was described in a British Museum exhibit in the 1940s. But, Leakey pointed out, this theory needed to be jettisoned

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[858] Tax, "Introduction to the Symposium," 1.
[859] Louis Leakey, "Facts Instead of Dogmas on Man's Origin," in DeVore, "The Origin of Man," 3.
[860] Leakey, "Facts Instead of Dogmas," 4. "cc." stands for cubic centimeters; the Rubicon reference was also a favorite of Max Müller's for talking about language and the animal-human boundary, although this similarity probably only comes from the fact that both men were classically educated and knew their Caesar.

too, "because Jane Goodall has shown that chimpanzees in wild conditions make no less than three different kinds of tools."[861] In fact, not only did chimpanzees use tools, but they made them according to consistent patterns and had been observed teaching the same techniques to their young.[862] Leakey added:

> To all of that we would have said 5 years ago "impossible! Of course wild chimpanzees don't do anything like that—they're only pongids. They've got a brain capacity far too small."[863]

Theory had suggested that this kind of behavior should be impossible; but there it was, observed in the field. Zoological theory, Leakey said, had claimed there could only be one type of hominin in the environment at a given time. The fossils and tool cultures at Olduvai, however, suggested that at least three different hominins might have coexisted in the region contemporaneously, although Leakey cautioned that this differentiation between species could only be based on morphological variance in the fossils themselves; attempting to use cultural evidence for taxonomic purposes was out of the question.[864]

Next, Garniss Curtis and J.F. Evernden—Leakey's co-authors on the 1961 paper on *Zinjanthropus*' spectacular age—spoke about potassium-argon dating and their work in East Africa.[865] Calculating the ages of successive volcanic strata meant that paleontologists could assign date ranges, in absolute terms, to the characteristic fossils found between each layer. Unfortunately, while this research was filling out the paleontological history of East Africa, there

[861] Leakey, "Facts Instead of Dogmas," 4.
[862] Leakey, "Facts Instead of Dogmas," 9.
[863] Leakey, "Facts Instead of Dogmas," 9.
[864] Leakey, "Facts Instead of Dogmas," 9.
[865] Garniss H. Curtis, "Evaluation of the Olduvai Discoveries," in DeVore, "Origin of Man," 20.

were no convenient volcanoes in South Africa, and the two regions had few prehistoric fauna in common.[866]

Each successive session dealt with a different component of the "Man problem." Reflecting the presence of major architects of the evolutionary synthesis, including Theodosius Dobzhansky and G.G. Simpson, there were two panels that touched on the themes of species differentiation, classification, taxonomy, and evolutionary processes, although in the main both panels devolved into arguments over the African paleoanthropologists' penchant for wildly proliferating genera and species.[867] Louis Leakey was perhaps the chief perpetrator, although the issue of "lumpers vs. splitters" ran through the entire symposium, although the stakes varied by population. In one session, the American ant biologist and taxonomist William L. Brown, Jr. answered the charge to pick a side by saying "When people ask me whether I am a lumper or a splitter, I find it convenient to say that when I need to lump, I lump; when I need to split, I split."[868] The paleoanthropologists working in the field (such as Leakey, and the anatomist John Robinson, formerly based in South Africa, although he moved to the US in the 1960s after being repeatedly passed over for promotion at Wits) were fighting about how to classify their specimens (with attendant issues of prestige and professional credibility on the line), while the US-based taxonomists came from a wider range of biological sub-disciplines (they were not strictly concerned with hominin evolution) and were carrying on a conversation that they had been having at symposia and conferences in the US for nearly twenty years. Leakey and his East African hominins were just dropping in. If the history of paleoanthropology is told from the

[866] The current Republic of South Africa has one active volcano, located on Marion Island in the Indian Ocean. Curtiss also noted that East Africa and South Africa also have distinct fauna in the present, so it was disappointing but not surprising that it was difficult to establish contemporaneity between deposits.
[867] The two sessions were "Classification as Synthesis" and "Synthesis and Evolution," although debates on hominin taxonomy also briefly took over the discussion in "Behavior as Adaptation."
[868] Brown, general discussion, in DeVore, "Origin of Man," 65.

perspective of the United States, this synthesis-taxonomy narrative takes center stage, but there are other ways of telling this story. The point here is that there were distinctly different threads of intellectual and professional orientation here; just because Leakey (for example) is crossed streams with the synthesis taxonomists does not mean that his entire research program needs to be understood as an extension of the synthesis from the beginning.

Two other sessions—"Behavior as Adaptation" and "Language and Communication"—highlighted the huge increases in research activity that had been ongoing in primate studies and linguistics, respectively, since 1960. Primatologist Irven DeVore began his session by saying, "If you compare what we know about primate behavior today with what we knew as recently as 1960, I believe it would be fair to say that there has been a rebirth of interest in primate studies," while in "Language and Communication" Thomas A. Sebeok said that he despaired of conveying "to this distinguished gathering of non-linguists the rich flavor of the revolution that has taken place in linguistics since approximately 1960."[869] Darwin had originally suggested Africa as the cradle of the human species because it was the continent populated by the great apes that were most morphologically similar to humans; now, African apes were being studied as evolutionary models for thinking through hominin language acquisition, tool-use, and social interaction.[870]

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[869] See Irven Devore, "Behavior as Adaptation," in DeVore, P. "Origin of Man," 52, and Sebeok, general discussion, 86.

[870] This question of whether apes are being studied as a way of getting information into human evolution, or as interesting subjects in their own right (or both, simultaneously) is a fraught one; several different perspectives are described in Shirley C. Strum and Linda M. Fedigan, eds. *Primate Encounters: Models of Science, Gender, and Society* (Chicago: University of Chicago Press, 2000). On primates as models, see also Susan Sperling, "The Troop Trope: Baboon Behavior as a Model System in the Postwar Period," in Angela Creager, Elizabeth Lunbeck, and M. Norton Wise, eds. *Science Without Laws: Model Systems, Cases, Exemplary Narratives* (Durham: Duke University Press, 2007), 73-89. Lastly, on the applicability of approaching human behavior as a variant on a larger category of primate behavior, Carleton Coon quipped: "From seeing DeVore's primate work, it strikes me that there is one big difference between *Homo sapiens* and the other primates; that is, that *Homo sapiens* is able to sit through forty-odd hours of a conference with several hundred individuals in one room, uncaged, without either scrambling for the trees or biting. Of course, there was a little flexing of the facial muscles and even an occasional retraction of the lips. These minor dental displays were not over food or sex or in defense against predators but, rather,

Irven DeVore cautioned his colleagues against treating modern hunter-gatherer groups in Africa as if they were "living fossils of the Paleolithic."

> One has to be very careful what conclusions are drawn from the study of living hunter-gatherers…They are studied in what one might call a logical exercise in which one tries to test certain hypotheses about Paleolithic man that seem quite reasonable as you sit in your office but become patently absurd when you see the problems faced by living hunter-gatherers.[871]

Anthropologist Subhash Chandra Malik agreed:

> I think we are probably all aware that the idea that living "primitive" groups are static, residual leftovers from the Paleolithic is a pitfall on a par with the concept of the 'missing link' in physical evolution.[872]

Every theme at the 1965 symposium had been addressed before in the history of scientific thought about human origins. Each session had a long and complicated intellectual trajectory that stretched back, in some cases, into the eighteenth century. Without that larger, stranger, and more far-ranging history, it becomes difficult to understand the alignment of interests that brought these questions into a common space.

At the 1965 symposium, though, there was no discussion about where the human species began, or whether Africa had ever contributed anything to human history. While the questions the conference-goers raised spoke to the same themes that had occupied students of human origins since the late eighteenth century—about the origin of speech, about the nature of variation, and the boundary line between animals and humans—the answer to the question "Where should we look?" had changed, and been settled. Leakey finished his talk by exhorting his colleagues to "stop speculating and get teams out all over the place," to more fully

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over teeth themselves—something that an ape, with his limited cortex and his limbic area, could never imagine." (Coon, general discussion, 128.)

[871] Irven DeVore, transcript of open discussion in DeVore, P., "Origin of Man," 66.

[872] Subhash Chandra Malik, transcript of open discussion in DeVore, "Origin of Man," 66.

understand the human story, but it was clear to him, as it was to his fellow attendees, that Africa was the place where humankind began.

In the intervening half-century since the Wenner Gren symposium of 1965, researchers in many different parts of Africa—including Chad, Algeria, Morocco, Ethiopia, Kenya, Tanzania, and South Africa—have continued to unearth hominin ancestor fossils.[873] These discoveries have suggested that there were multiple species of hominin existing around the same time, although many gaps in the record still exist. In the quick recounting of the history of paleoanthropology that begins many news stories and even some scientific articles, the narrative hits the same few notes: Darwin – Dart – new discovery. Nevertheless, the Asian origins hypothesis has fundamentally shaped how paleoanthropology has developed as a field. Like a gravity well—invisible to observers, but bending space-time and redirecting objects around it—the Asian origins hypothesis is still present in this history, and it cannot be ignored.

[873] See, for example, Jean-Jacques Hublin, Abdelouahed Ben-Ncer, Shara E. Bailey, Sarah E. Freidline, Simon Neubauer, Matthew M. Skinner, Inga Bergmann, Adeline Le Cabec, Stefano Benazzi, Katerina Harvati, and Philipp Gunz, "New fossils from Jebel Irhoud, Morocco and the pan-African origin of *Homo sapiens*," *Nature* 546, no. 7657 (June 8, 2017), 289-292. (My thanks to Steven Kern for this source.) The other "big thing" in human origins study is, of course, studies of mitochondrial DNA and the identification of the "most recent common ancestor" of all living humans, who was a woman living approximately 200,000 years ago, in Africa. (See Rebecca L. Cann, Mark Stoneking, and Allan C. Wilson, "Mitochondrial DNA and Human Evolution," *Nature* 325, no. 6099 (January 1, 1987), 31-36.) Fascinatingly enough, when the geneticist Luca Cavalli-Sforza contested Cann, Stoneking, and Wilson's results, he placed the root of human mitochondrial history in *Asia*, even though, as Cann described the work in an interview in 2010, "There really wasn't good evidence, other than thinking that modern humans couldn't have evolved in Africa." See Jane Gitschier, "All About Mitochondrial Eve: An Interview with Rebecca Cann," *PLoS Genetics* 6, no. 5 (May 2010), 4. On Cavalli-Sforza and genetics, see Marianne Sommer, *History Within: The Science, Culture, and Politics of Bones, Organisms, and Molecules* (Chicago: University of Chicago Press, 2010), part 3.

ACKNOWLEDGEMENTS

Like many parts of the dissertation, I approached writing the acknowledgements with verve and enthusiasm, and then realized how difficult it would be to cover all the ground necessary, and to fully express the depths of my admiration and gratitude.

The first and greatest debt is to my co-advisors, Erika Milam and Michael Gordin. Their advice, enthusiasm, and continuing willingness to challenge me to sharpen my writing and strengthen my arguments have strengthened the project immeasurably. Thank you both for your kindness and friendship: you are models for the graduate advisor I hope someday to be.

Stephen Kotkin's seminar on modern global history was one of my favorite courses in graduate school, and one of the ones that most profoundly shaped my present intellectual path. Thank you for your many intellectual provocations and your advice. Similarly, thank you to Alice Conklin, my external reader, whose work on empire and anthropology has been both a resource and an inspiration. I am honored to have you both on my committee.

Innumerable thanks are also due to the many members of Princeton's history of science program seminar, including Michael Barany, Reut Harari, Adrian Young, Jessica Wright, Ingrid Ockert, Yael Geller, Felix Rietmann, Wangui Muigai, Kathryn Maxson, Elaine Ayers, Joshua Bauchner, Ezelle Sanford, Megan Baumhammer, Richard Calis, Christian Flow, Julia Stone, Hannah Marcus, Tony Grafton, Jenny Rampling, Keith Wailoo, Angela Creager, Katja Guenther, and Graham Burnett. The generous feedback and intellectual breadth and depth of the seminar, and the sheer talent packed into Dickinson 230 on the average Monday afternoon are astonishing; it's been a privilege and a delight to be a part of this community.

Being a part of Princeton's Global History Collaborative has been a pleasure, and my work has been better for it. Thank you to Jeremy Adelman and Sheldon Garon, and to my many wonderful graduate student colleagues and workshop co-organizers, especially Gabriela Goldin Markovich, Laetitia Lenel, Marcia Schenck, Paula Vedoveli, Andrew Edwards, and Christian Flow. At home in the History Department, Jackie Wasneski and Kristy Novak have always had my back—thank you both.

This project would not have been possible without the expertise and assistance of many librarians and archivists in Great Britain, France, the Netherlands, and the United States. Particularly, I wish to thank Hellen Peters (NHM-London), Fahema Begum (RCS), Dr. Natasja den Ouden (Naturalis), Adele Torrance (UNESCO), and Gregory Raml (AMNH), who went above and beyond to help me find difficult materials. Many thanks are also due to the Circulation and Reference departments of Princeton's Firestone Library. The reference desk deserves special mention as a stalwart employer of history graduate students; working as an information assistant provided an entry into a very fun community, as well as additional funds for post-archive cake.

Draft material from the dissertation was originally presented at multiple conferences and workshops, including the History of Science Society (HSS) annual meetings in San Francisco (2015) and Toronto (2017); the International Congress of History of Science and Technology in Rio de Janeiro (2017); the Princeton-Humboldt Graduate Global History Workshop in Berlin

(2017); the Princeton-Berlin-Paris-Tokyo Global History Collaborative in Paris (2016); the University of Tokyo's Global History Collaborative Summer School (2015); Princeton's University Center for Human Values (2016); the Princeton-MIT-Harvard Graduate Workshop on the History of the Physical Sciences (Phunday), which warmly welcomed a paleoanthropological interloper for multiple years running; and Princeton's History of Science Program Seminar. Getting to present work, exchange ideas and enthusiasms, and gather questions and insights from colleagues around the world has been a fabulous gift, and my project has been immeasurably improved as a result. I would also like to acknowledge the generous financial support of the Princeton History Department; the Princeton Global History Collaborative; the Princeton Institute for International and Regional Studies; and the Huntington Library Travel Fellowship to Great Britain.

During my time in graduate school, I've been fortunate to overlap with many truly wonderful people, including Morgan Robinson, Emily Prifogle, Joel Suarez, Richard Anderson, Kalyani Ramnath, Andrew Edwards, Merle Eisenberg, Hollis Dvorkin, Kathryn McGarr, and Wangui Muigai. Julia Stone, Pallavi Podapati, and Tara Suri supplied me with advice, food, and humor in the final stages of writing, while Caroline Mann kept me in coffee and good company. Likewise, Timothy Nielsen has been a source of encouragement, perspective, and much-needed silly gifs from start to finish. Even without being physically present in the same library, it's been a joy to make this intellectual journey alongside Abbey Stockstill and Aro Velmet. Thank you also to my fabulous sister Jane Kern, just about to leave on her first research trip. Whatever you end up exploring next, I know it will be a privilege to witness it.

My parents, Steven and Jennifer Kern have encouraged my passions and ambitions all my life. Although you both know better than anyone how widely my interests have ranged, it's fun to think how this project might have some deep roots in all the time we spent at the University of Utah's natural history museum, looking at rocks and fossils and Paleolithic artifacts. Thank you for inculcating a love of history, science, art, and food, and for starting me on the path to global travel at the tender age of three weeks. I dedicate this project to you.

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- Ernst Mayr correspondence

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