BOOK REVIEWS

Out of East Africa

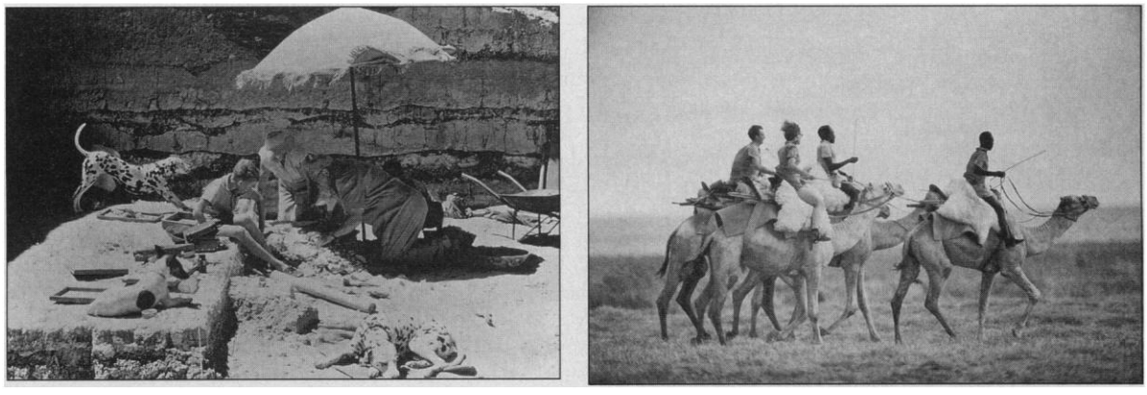
Ancestral Passions. The Leakey Family and the Quest for Humankind's Beginnings. VIRGINIA MORELL. Simon and Schuster, New York, 1995. 639 pp., illus., + plates. $30 or $C40.

Virginia Morell, like the three Leakeys who are the subjects of this book, apparently gravitates to large challenges; any one of her subjects has led a life that could keep a biographer busy, yet here this accomplished and widely read science writer successfully takes on all three and more.

Ancestral Passions opens in 1902 with the arrival in East Africa of Louis Leakey's missionary parents. The image sticks, for the energy and focus associated with missionary zeal characterize the subjects of this biography—Louis and son Richard with their highly public, dramatic form of zeal, and Mary with her more private, though no less persistent, variant. These three Leakeys' mission, their passion as Morell puts it, became the search for human origins in the fossil record and its associated artifacts. In the pursuit of this passion, the Leakeys themselves and East Africa became the center of paleoanthropology in the 20th century. So it is not surprising that this three-subject biography is more than biography. The book's other threads include the story of 20th-century African paleoanthropology, the history of modern East Africa, particularly Kenya, and the conduct of science and fieldwork. And, although each of Morell's subjects has written at least one autobiography, only in the present volume do the events and entanglements of their work and lives unfold from the perspective of more than one of these powerful personalities, as well as from the perspectives of those non–family-members, a very large number of whom were interviewed over a number of years for this volume, who at some time have been supporters, detractors, competitors, or colleagues of various Leakeys.

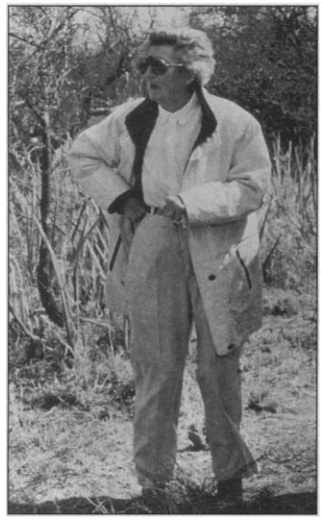
Sometimes successively, sometimes collaboratively, Louis, Mary, and Richard and their groups have played pivotal roles, through ideas as well as excavations, in every major 20th-century shift in our understanding of hominid evolution—Louis as a pioneer in the revolution that placed the site of our emergence in Africa rather than Asia and placed the timing much earlier than had been believed; Mary and Louis with their famous hominid *Zinjanthropus*, discovered after 30 years of searching in Olduvai, and their contributions to the linking of the southern and eastern African hominids; Mary with her archaeological discoveries and innovations in archaeological excavation style; the Leakeys as leaders in developing the hypothesis of a multiple-threaded hominid heritage rather than a single, linear one; Mary with her magical footprint trail from individuals at Laetoli, which thrust her into the limelight; Richard and Meave Leakey with the finds from their northern sites, including "1470," the "Turkana Boy"; and Meave with her most recently announced discoveries that extend the stories of hominids and nonhuman primates. However isolated their work sites, always the Leakeys are at the center of the paleoanthropological action.

From his first expeditions, Louis Leakey established patterns in his projects that persisted throughout his life—his breadth of interest, encompassing modern human and nonhuman primates in all aspects of their lifestyles; his energy and impatience; his creativity and active imagination that were charismatic and launched many a bold project but also resulted in excessive, unsupported claims and led to financial and scientific trouble. Louis could withstand, even seek out, great hardship, in pursuit of the key to human origins, but he was often much too impatient to work with appropriate care at a site or to do the meticulous, long-term work that establishing scientific results required. In their partnership, Mary Leakey complemented her husband's style and, though without conventional formal training, was increasingly considered the more solid scientist, staying in the field while Louis became increasingly occupied with publicity and money-raising in almost constant worldwide travel. Anxious to avoid his father's incautious mistakes, yet sharing his father's flair, competitiveness, and thrill of the chase, Richard Leakey sought a middle ground, in part through scientific collaborations, yet found himself in conflict first with his father and then with his mother, as well as with scientific colleagues unequaled in the competitiveness and publicity-seeking of their approach to science. The Leakeys were particularly vulnerable to their critics because none of the three had traditional Ph.D. training in their field or practiced their profession within the academic establishment. Louis, and later Richard, both reveled in being an outsider and rebel and coveted academia's approval and rewards. Although all three Leakeys eventually received recognition in the form of honorary degrees and numerous invitations, controversy was never far away.



Left, "Leakey expeditions were always family affairs, including Dalmatians and fox terrier. Above, Louis, Mary, and eleven-year-old Philip excavate a nearly two-million-year-old site in Olduvai Gorge." [From *Ancestral Passions*; Robert F. Sisson, © National Geographic Society] *Right*, "Camels at Koobi Fora: Richard, Meave, Kamoya Kimeu, and Peter Nzube head into Lake Turkana's badlands to search for hominid fossils." [From *Ancestral Passions*; Gordon W. Gahan, courtesy of National Geographic Society]

Scientists are solvers of mysteries, of puzzles, and Morell draws the reader into the mysteries of human origins. But we are reminded, too, that discoveries arise only in part through application of the scientific method with appropriate equipment and other resources; in part they come about through art, intuition, and luck, in part through competition and cooperation. Moreover, the success of a discovery—its fame, influence, and ability to garner resources for subsequent efforts—arises not just from its inherent contribution to knowledge but also from showmanship, timing, and outsiders' fascination with certain topics. Within paleontology, human origins receive competition for attention only from dinosaurs. Fossil findings receive the attention of *Nature* or *Science*, daily newspapers, and broadcasts in proportion not so much to their contribution to our understanding of evolution as to the extent to which they might extend the human genealogical tree. This must be a source of frustration and bemusement to other paleontologists. Perhaps as a result of its broad attraction, paleoanthropology seems to be subject to an unusually large share of the non-science components of the scientific enterprise, attracting a disproportionate share of showmen. In his later years, both Louis Leakey and science were ill served both by his loss of perspective and his increasing dependence not on the thrill of intellectual or fossil explorations and discoveries but on the adulation of the public and of the young women with whom he became professionally and often personally engaged.



"Mary, eighty years old, at Olduvai Gorge in 1993, where scientists from around the world gathered for an international conference in her honor." [From *Ancestral Passions*; Adrienne Zihlman]

In *Ancestral Passions*, as the many stories unfold that span more than a half-century of exploration by the Leakeys and other paleoanthropologists, the reader follows a fascinating trail of emerging evidence about our ancestors. At the same time another story emerges, one also not solely restricted to the Leakeys, and one can't help wondering at what point the personal ambition that is productive, even necessary, in science becomes destructive, to science and even to the individuals. When the preoccupation comes to be with being "right," with "winning," when the discourse begins to sound more like a football game or even a war, surely that point is past. Morell's book includes numerous examples of such competitions, from the very start of Louis's career through the most recent relations between Richard Leakey and Donald Johanson, with science almost always compromised by more than one party to the debates. The volume provides food for thought about the practice of science well beyond the parties and area described. Fieldwork of many kinds attracts, to some extent requires, the skills and temperament of the adventurer and explorer as well as of the scientist, and many practitioners display big egos and "machismo," suiting the oft-used label "Kenya cowboys." Laboratory science has its equivalents, and this book can serve as well as formal sociology-of-science studies as a launching pad for discussions of what makes for good science and how science is shaped by its practice and by teaching. In his many conversations with Morell, Richard Leakey reflects on past events and the motivations that influenced his and others' stances. Morell quotes abundantly from documents and conversations with diverse parties about events spanning much of the past 50 years, providing a greatly enriched perspective.

The book's themes of discovery of human origins and the practice of science are joined by the history of East Africa in this century and the changing political landscape in Kenya. Louis Leakey grew up enmeshed in the Kikuyu community, and he retained complex professional and personal ties with that tribe throughout his life, alternately accused of betraying whites when he supported local rights, of betraying Kikuyus when he was the translator at the infamous Kenyatta trial, and of tribalism in his favoring of Kikuyus on his fossil team over the many other tribes in Kenya. Later, Mary's team members were of the Kamba tribe, but Richard and Meave's are simply the "Hominid Gang," the leaders of which have increasingly shared the limelight. Richard Leakey, like his father, developed a strong involvement in the fate of his country, starting with his leadership in establishing the National Museums of Kenya as a truly Kenyan institution with international standing. At the same time, he maintained a long-standing involvement in conservation of Kenya's wildlife, and at the close of Morell's book, in 1989, Richard is about to leave the Museums, at President Moi's request, to direct Kenya's wildlife department and reverse spiraling poaching and degeneration of Kenya's wildlife programs. By the end of his dramatic five-year tenure in this position, Richard had survived his second brush with death, virtually put an end to poaching, and produced an efficient, professional Kenya Wildlife Services that attracted both skilled Kenyans and international funding. As usual, though, controversy was close at hand as Richard's control of poaching offended powerful politicians and his independent style offended those and other critics. So, not surprisingly in the fast-moving Leakey world, this book required an epilogue, as Richard left the Wildlife Services and joined in leadership of an opposition political movement in Kenya, putting his life at risk again and being thrust once more into the limelight.

Although this book is in many ways more than a biography, some readers may at the same time find it less than complete in that regard, for it focuses on its subjects' professional rather than personal lives and relationships, except to the extent that the personal is conspicuously entwined with the professional—though this extent is often considerable given a small and emerging discipline peopled with strong personalities, isolated fieldwork, and members of the same family working in the same discipline and often in collaboration. To some extent, too, whether reflecting the pull of charisma, gender bias, or just the reality of what makes for better story-telling, Morell's story is weighted toward the two more public members of the family, Richard and Louis. The more cautious and thorough, as well as more private, Mary emerges less, both personally and professionally, and she does so primarily as her husband's professional and personal activities become more scattered and after his death. And Meave Leakey, Richard's wife and long a respected scientist whose research focuses on primates more distant from humans, is only now receiving widespread attention for her findings as her husband turns to non-science politics and her latest discoveries are being linked more closely to human origins. Her biography is yet to be written.

As Meave continues the Leakey tradition, the daily conduct of fieldwork in Africa's semiarid regions remains in some ways the same as a half-century or more ago: long days of primarily tedious, low-technology work in relative isolation from academia and from the bustle of 20th-century concerns. Since Louis's arduous expeditions in the 1920s, solar technology may have brought computers and refrigeration to remote areas, unseen satellites may now be as likely as a compass to guide the ecologist or

paleontologist, small-plane transport may be commonplace for those who can afford it, and radio and even telephone may be within close reach of field sites—Mary could be rescued by son Jonathan when suddenly struck with illness at Olduvai, and Richard could be summoned within a few hours from Nairobi to Koobi Fora to share in the thrill of a new discovery or in the attempted rescue of a lost and dying co-worker. But roads are often still little more than tracks that become impassable for weeks or months at a time, and researchers are halted temporarily or even permanently by snakes, elephants, lions, malaria, or other illnesses; one can still experience with awe a blackened night sky studded with thousands of brilliant light points over a campsite, savor days at a time uninterrupted by a single jarring phone call, experience wonder-tinged annoyance at sleep interrupted by elephant stomach-rumbles or the thrill of sharing the daily, casual company of evolution's most improbable products. To those who have ever caught the African "bug," this book has a feel of timelessness as well as of history told.

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Vignette: Realism vs. Antirealism

What is the relation between our knowledge and the world? There is, of course, a well-developed debate on this topic in the philosophy of science that goes under the heading of "scientific realism," but this debate translates the question into a very limited and intransigent form. Traditional philosophy works within the representational idiom, and the space in which it can take on the realistic problematic is exhausted by knowledge (empirical and, especially, theoretical) on the one side, and the world itself on the other. And just about the only philosophical question that can be constructed in this space is, does scientific knowledge mirror, correspond to, represent truly, how the world really is? . . .

In these debates, the realists have on their side our routine tendency to see knowledge as transparent, and our tendency to respect the hard work of well-funded communities of clever people. . . . The antirealists, though, are in possession of a single, apparently unstoppable argument . . . . Barring mystical revelation or divine inspiration, science is generally regarded as being the best knowledge we can have of how the world really is, so that it is impossible to imagine going behind the scenes of science to check whether science has, in this instance or that, got it right.

—*Andrew Pickering*, in *The Mangle of Practice: Time, Agency, and Science* (University of Chicago Press)

Demythification

Nazi Science. Myth, Truth, and the German Atomic Bomb. MARK WALKER. Plenum, New York, 1995. viii, 325 pp., illus. $28.95.

Germany has never produced or possessed nuclear weapons, and if Germans ever eagerly wished to have them it was in the late 1950s, in the context of the Cold War, not in Nazi times. Why, then, does a book that devotes only a few of its pages to German research on nuclear fission during World War II bear a title such as this one does? The title, it seems, is for selling, not telling. Yet this title *is* telling: as symbol, the atomic bomb is one of the great fascinations of the second half of this century, and "Nazi" denotes another. Further, the title is itself a piece of symbolic politics, for the book appears to have been produced with some haste, quickly enough to come out somewhere near the 50th anniversary of the Hiroshima bomb. Meanwhile we are becoming aware that these words, these symbols, and these fascinations—especially those with horror as the associated affect—have their own life and history. Walker's book is, in part, a step toward the analysis of this history. But it is only a step, and only in part.

In 1989 Walker published the standard account of the German fission project, *German National Socialism and the Quest for Nuclear Power* (Cambridge University Press), and in 1993 he edited, with Monika Renneberg, the best collection to date of papers on "Nazi science," *Science, Technology, and National Socialism* (Cambridge University Press). Thus he knows what and how science was done in Nazi Germany. But his new book does not deal with Konrad Lorenz's ethology emerging in the framework of Nazi ideology, or with breeding research and race theory, or with experiments on humans in concentration camps the results of which were used in later physiological literature. Neither does it deal with calculation of orbits for the V-2 or—except for the few pages on Heisenberg's uranium pile—with other R&D for the German military. In this book, then, Walker is not telling us about Nazi science but is concerned with—and involved in—symbolic politics. The two names occurring most frequently in the book are those of Werner Heisenberg and Adolf Hitler. Here you have the clash of symbols: the genius of pure science and the genius of extreme political evil.

In his introduction Walker complains that the standard interpretations of this era in the history of science are cast in terms of black and white—approaching every actor with the question "Nazi or anti-Nazi?"—and he sets out to show how broad is the gray zone between these extremes. His objects of study are Johannes Stark, the Nobel laureate in physics notorious for his advocacy of a racially defined "German" physics; the Prussian Academy of Sciences and its progressive nazification; and, with the focus on Heisenberg, the German atomic physicists involved in fission research. Not surprisingly, practically every person and every institution is shown to be in an ambiguous position, neither purely good nor purely evil.

Regarded as an attack on the persistent myth of heroes and villains in the history of science, the book gains coherence. Stark, the Prussian Academy, and Heisenberg have been paradigmatic objects of such simplistic judgment. The great scientist—Heisenberg—is not (at least not in print, not in any medium accessible to "the children") to be associated with bad politics or doubtful moral conduct. And the renegade scientist—Stark—has to be nothing but bad so that the good guys can be made to look nothing but good. Finally, the institution of high reputation and long tradition—the Prussian Academy—is to be seen as merely a victim of political pressures from the outside intruding violently into the peaceful and unpolitical sphere of scholarship. Those are the ahistorical myths of science, concentrated in symbolic names and words that signify only purity and innocence and their opposites.

Walker's best demythification is the story he tells of Heisenberg's lectures in foreign countries. In 1936–37 Heisenberg was attacked by Stark as the "white Jew" of physics. Thus being politically suspect he was frequently denied permission to travel