PREFACE

It is every anthropologist's dream to unearth a complete skeleton of an ancient human ancestor. For most of us, however, that dream remains unfulfilled: the vagaries of death, burial, and fossilization conspire to leave a meager, fragmented record of human prehistory. Isolated teeth, single bones, fragments of skulls: for the most part, these are the clues from which the story of human prehistory must be reconstructed. I don't deny the importance of such clues, frustratingly incomplete though they are; without them, there would be little to tell of the story of human prehistory. Nor do I discount the raw excitement of experiencing the physical presence of these modest relics; they are part of our ancestry, linked to us by countless generations of flesh and blood. But the discovery of a complete skeleton remains the ultimate prize.

In 1969, I was blessed with extraordinary good fortune. I had determined to explore the ancient sandstone deposits that make up the vast eastern shore of Lake Turkana, in northern Kenya—my first independent foray into fossil country. I was driven by a strong conviction that major fossil discoveries would be made there, because I had flown over the region in a small plane a year earlier: I recognized that the layered deposits were potential repositories of ancient life—though many doubted my judgment. The terrain is rugged and the climate unrelent-

ingly hot and dry; moreover, the landscape has the kind of fierce beauty that appeals to me.

With the support of the National Geographic Society, I assembled a small team—including Meave Epps, who later became my wife—to explore the region. One morning several days after we had arrived, Meave and I were returning to our camp from a short prospecting excursion, by way of a shortcut along a dry riverbed, both of us thirsty and anxious to avoid the searing heat of midday. Suddenly, I saw directly ahead of us an intact, fossilized skull resting on the orange sand, its eye sockets staring at us blankly. It was unmistakably human in shape. Although the passing years have robbed my memory of exactly what I said to Meave at that instant, I know I expressed a mixture of joy and disbelief at what we had stumbled upon.

The cranium, which I immediately recognized as that of *Australopithecus boisei*, a long-extinct human species, had only recently emerged from the sediments through which the seasonal river coursed. Exposed to the sunlight for the first time since the elements buried it almost 1.75 million years ago, the specimen was one of the few intact ancient human skulls that had yet been found. Within weeks of its exposure, heavy rains would fill the dry bed with a raging torrent; if Meave and I had not come upon it, the fragile relic would certainly have been destroyed by the flood. The chances of our being there at the right time to recover the long-buried fossil for science were minuscule.

By a curious coincidence, my discovery occurred a decade, almost to the day, after my mother, Mary Leakey, had found a similar cranium at Olduvai Gorge, in Tanzania. (That cranium, however, was a daunting Paleolithic jigsaw puzzle; it had to be reconstructed from hundreds of fragments.) Apparently I had inherited the legendary "Leakey luck," enjoyed so notably by Mary and my father, Louis. And indeed my good fortune held, as subsequent

expeditions I led to Lake Turkana turned up many more human fossils, including the oldest-known intact cranium of the genus *Homo*, the branch of the human family that eventually gave rise to modern humans, *Homo sapiens*.

Although as a youth I had vowed not to become involved in fossil hunting—wishing to avoid being in the considerable shadow of my world-famous parents—the sheer magic of the enterprise drew me into it. The ancient, arid deposits of East Africa that entomb the remains of our ancestors have an undeniable, special beauty, yet they are unforgiving and dangerous, too. The search for fossils and ancient stone tools is often presented as a romantic experience, and it certainly possesses its romantic aspects, but it is a science where the fundamental data have to be recovered hundreds or thousands of miles distant from the comfort of the laboratory. It is a physically challenging and demanding enterprise—a logistical operation upon which the safety of people's lives sometimes depends. I found that I had a talent for organization, for getting things done in the face of difficult personal and physical circumstances. The many important discoveries from the eastern shore of Lake Turkana not only seduced me into a profession I had once vehemently eschewed but also established my reputation in it. Nevertheless, the ultimate dream—a complete skeleton—continued to elude me.

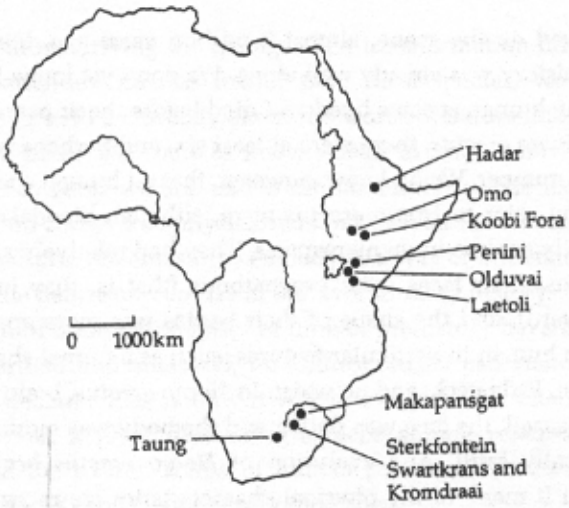
In the late summer of 1984, with our collective breaths held and our steadily building hope tempered by the hard reality of experience, my colleagues and I saw that dream begin to take shape. That year we had decided to explore for the first time the western shore of the lake. On August 23rd, Kamoya Kimeu, my oldest friend and colleague, spotted a small fragment of an ancient cranium lying among pebbles on a slope near a narrow gully that had been sculpted by a seasonal stream. Carefully we began a search for further fragments of the skull and soon found more than we dared hope for. During the five seasons of

excavation that followed this find, amounting to more than seven months in the field, our team moved fifteen hundred tons of sediment in the massive search. We uncovered what eventually turned out to be virtually the entire skeleton of an individual who had died at the edge of the ancient lake, more than 1.5 million years ago. Dubbed by us the Turkana boy, he was barely nine years old when he died; the cause of his death remains a mystery.

It was a truly extraordinary experience to unearth fossil bone after fossil bone: arms, legs, vertebrae, ribs, pelvis, jaw, teeth, and more cranium. The boy's skeleton began to take shape, reconstructed as an individual once again after lying in fragments for sixteen hundred millennia. Nothing as complete as this skeleton is found in the human fossil record until Neanderthal times, a mere 100,000 years ago. Quite apart from the emotional thrill of such a find, we were aware that the discovery promised great insight into a critical phase of human prehistory.

A word, before I go on with the story, about jargon in anthropology. Sometimes the blizzard of arcane terms can be so fierce as to defy comprehension by all but the most dedicated professionals. I will avoid such jargon, as far as is possible. Each of the various species of the prehistoric human family has a scientific label—that is, its species name—and we can't avoid using these. The human family of species has a label of its own, too: hominid. Some of my colleagues prefer to use the term "hominid" for all ancestral human species. The word "human," they argue, should be used to refer only to people like us. In other words, the only hominids to be designated "human" are those that display our own level of intelligence, moral sense, and depth of introspective consciousness.

I take a different view. It seems to me that the evolution of upright locomotion, which distinguished ancient hominids from other apes of the time, was fundamental to sub-



Major fossil sites. The first early human fossil discoveries were made at cave sites in South Africa, beginning in 1924. Later, from 1959 onward, important discoveries began to be made in East Africa (Tanzania, Kenya, and Ethiopia).

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sequent human history. Once our distant ancestor became a bipedal ape, many other evolutionary innovations became possible, with the eventual appearance of *Homo*. For this reason, I believe that we are justified in calling all hominid species "human." By this I do not mean to suggest that all ancient human species experienced the mental worlds we know today. At its most basic, the designation "human" simply refers to apes that walked upright—bipedal apes. I will adopt this usage in the following pages, and will indicate when I am using it to describe features that characterize only modern man.

The Turkana boy was a member of the species *Homo erectus*—a species pivotal in the history of human evolution. From different lines of evidence—some genetic, some fossil—we know that the first human species evolved about 7 million years ago. By the time *Homo erectus*

arrived on the scene, almost 2 million years ago, human prehistory was already well along. We don't yet know how many human species lived and died before the appearance of *Homo erectus*: there were at least six, and perhaps twice that number. We do know, however, that all human species living prior to *Homo erectus* were, although bipedal, distinctly apelike in many respects. They had relatively small brains, their faces were prognathous (that is, they jutted forward), and the shape of their bodies was more apelike than human in particular features, such as a funnel-shaped chest, little neck, and no waist. In *Homo erectus*, brain size increased, the face was flatter, and the body was more athletically built. The evolution of *Homo erectus* brought with it many of the physical characteristics we recognize in ourselves: human prehistory evidently took a major turn 2 million years ago.

Homo erectus was the first human species to use fire; the first to include hunting as a significant part of its subsistence; the first to be able to run as modern humans do; the first to make stone tools according to some definite mental template; and the first to extend its range beyond Africa. We don't know definitively whether *Homo erectus* possessed a degree of spoken language, but several lines of evidence suggest this. And we don't know, and probably never will know, whether this species experienced a degree of self-awareness, a humanlike consciousness, but my guess is that it did. Needless to say, language and consciousness, which are among the most prized features of *Homo sapiens*, leave no trace in the prehistoric record.

The anthropologist's goal is to understand the evolutionary events that transformed an apelike creature into people like us. These events have been described, romantically, as a great drama, with emerging humanity as the hero of the tale. The truth is probably rather prosaic, with climatic and ecological modification rather than epic

adventure driving the change. The transformation arrests our attention no less for all that. As a species, we are blessed with a curiosity about the world of nature and our place in it. We want to know—*need* to know—how we came to be as we are, and what our future is. The fossils we find connect us physically to our past and challenge us to interpret the clues they embody as a way of understanding the nature and course of our evolutionary history.

Until many more relics of human prehistory have been unearthed and analyzed, no anthropologist can stand up and declare, This is how it was in every detail. There is, however, a great deal of agreement among researchers about the overall shape of human prehistory. In it, four key stages can be confidently identified.

The first was the origin of the human family itself, some 7 million years ago, when an apelike species with a bipedal, or upright, mode of locomotion evolved. The second stage was the proliferation of bipedal species, a process that biologists call adaptive radiation. Between 7 million and 2 million years ago, many different species of bipedal ape evolved, each adapted to slightly different ecological circumstances. Among this proliferation of human species was one that, between 3 million and 2 million years ago, developed a significantly larger brain. The expansion in brain size marks the third stage, and signals the origin of the genus *Homo*, the branch of the human bush that led through *Homo erectus* and ultimately to *Homo sapiens*. The fourth stage was the origin of modern humans—the evolution of people like ourselves, fully equipped with language, consciousness, artistic imagination, and technological innovation unseen elsewhere in nature.

These four key events provide the structure for the scientific narrative in the book that follows. As will become evident, in our study of human prehistory we are beginning to ask not only *what* happened, and *when*, but also

why things happened. We and our ancestors are being studied in the context of an unfolding evolutionary scenario, just as we would study the evolution of elephants or horses. This is not to deny that *Homo sapiens* is special in many ways: much separates us from even our closest evolutionary relative, the chimpanzee, but we have begun to understand our connection with nature in a biological sense.

The past three decades have witnessed tremendous advances in our science, the result of unprecedented fossil discoveries and innovative ways of interpreting and integrating the clues we see in them. Like all sciences, anthropology is subject to honest, and sometimes vigorous, differences of opinion among its practitioners. These stem sometimes from insufficient data, in the form of fossils and stone tools, and sometimes from inadequacies of methods of interpretation. There are therefore many important questions about human history for which there are no definitive answers, such as: What is the precise shape of the human family tree? When did sophisticated spoken language first evolve? What caused the dramatic increase in brain size in human prehistory? In the following chapters, I will indicate where, and why, differences of opinion exist, and sometimes I will offer my own preference.

I have had the good fortune to collaborate with many fine colleagues throughout more than two decades of anthropological work, for which I am grateful. To two of them—Kamoya Kimeu and Alan Walker—I should like to extend special thanks. My wife, Meave, has been a colleague and friend of the most extraordinary kind, especially in the most difficult times.