Every Bone Tells a Story

Hominin Discoveries, Deductions, and Debates

Jill Rubalcaba and Peter Robertshaw

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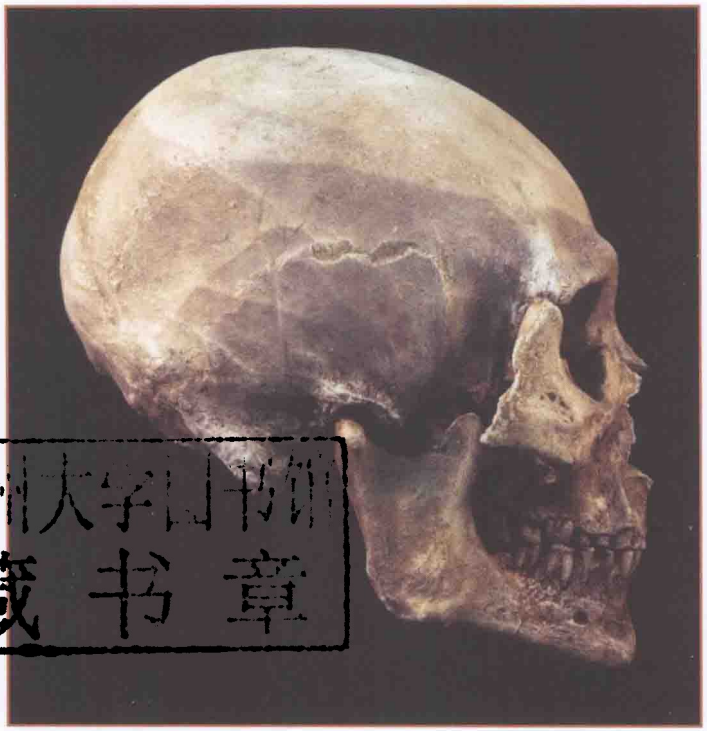

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To four very special hominins: Simon and Mia, Kelly and Daniel—P. R. and J. R.

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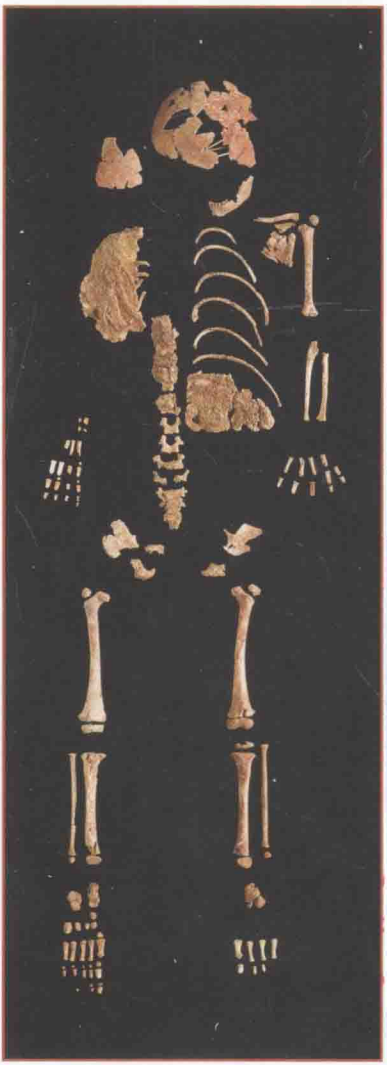

Highlighted are the places in which each hominin was discovered: Washington State (Kennewick Man), Portugal (Lapedo Child), Italy (Iceman), and Kenya (Turkana Boy).

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Introduction

Most people think the dead are silent, but to an archaeologist they're boisterous storytellers. Favorite tales come from remains thousands, even millions, of years old. Of course the dead don't leap out of their graves and give away their secrets. It takes scientists from every field imaginable to coax the details out of them. The stories are often garbled, and scientists don't always agree about what the dead are saying. And then sometimes another find comes along with a different version of the story that changes everything.

A hundred years ago archaeologists were adventurers with a splash of scientist in their blood. They were driven to find *things* from the past—grand things, like treasures and kings. In the last century archaeology has changed dramatically. Today's archaeologists are scientists first and foremost. They are driven to find out *about* things from the past—often ordinary things belonging to ordinary people.

These are the tales of four ordinary people—four hominins who lived long before recorded history. Although not long ago we would have called these four relatives of ours "hominids," researchers recently began calling humans and their ancestors by the more precise term "hominin." Join those researchers and archaeologists, along with scores of scientists in the discovery and recovery of these four hominins. Find out how scientists have expanded on what was learned in the field during the dig and what they've been able to deduce from each set of remains in the laboratory. Take a stand in the debates those deductions ignited. These

three Ds in archaeology—discovery, deductions, and debates—help scientists develop a picture of how people lived in the past.

We begin where it began for all hominins—in Africa. To be a member of our primate family, Hominidae, you must walk on two legs, and 1.6 million years ago Turkana Boy did just that. But did he speak? Turkana Boy, the most complete *Homo erectus* skeleton found to date in fossil-rich East Africa, sparked the questions, When did language begin? And why did we start talking?

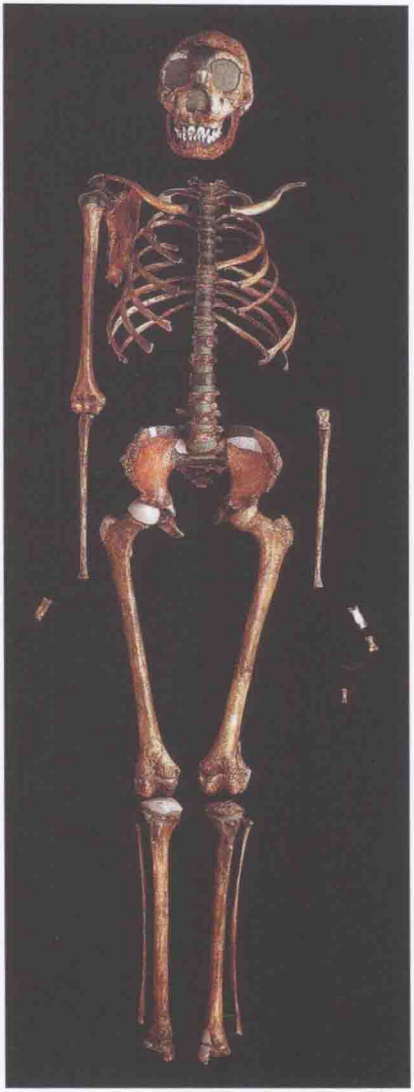
We know hominins got their start in Africa, but what was our ancestors' next move? How did they populate the world? The unusual anatomy of Portugal's Lapedo Child spiced up several hot archaeological debates. Who walked out of Africa, and what happened once they did? On what twig of the evolutionary "bush" does the Neandertal sit? As hominins evolved, were there crossovers between species that would explain Lapedo Child's mixed features? If Lapedo Child is part Neandertal, are you?

Populating the world was no easy task. There were those pesky oceans to cross to get to the Americas—or were there alternate routes? Kennewick Man, discovered in Washington State by students, instigated a battle that would make headlines for years. What did the modern humans who migrated to North America look like? How did they get here? Who can you claim as your ancestor, anyhow?

Tracing ancestry genetically began with Iceman. Due to a fortunate sequence of climatic events, Iceman came to scientists from a glacier in the Italian Alps with his soft tissue intact and his belongings preserved. Scientists worked to reconstruct an Alpine environment from 5,000 years ago and discovered a picture of modern humans on the move. DNA

from Iceman's living European descendants inspired a new way of looking at how farmers and agriculture spread into Europe. In a "which came first, the chicken or the egg?" debate, scientists grappled over the question, Which came first to Europe—the farmer or farming practices?

The remains of four ordinary people engaged thousands of scientific minds to produce countless deductions, which have fueled endless fiery debates. Not so ordinary, after all.



This reconstructed skeleton of Turkana Boy is the most complete example of a single *Homo erectus* individual yet discovered.

Turkana Boy
Discovery

1.6 million years ago . . .

The boy died facedown in a shallow lagoon. His body bobbed gently in the near motionless water close to the shore. Sand washed over him. Days turned into weeks; his flesh rotted. Months turned into years; his teeth fell out and collected in the cup of an animal's hoofprint. A hippo tromping through the shallows stepped on the boy's right leg bone, snapping it in two. Once flesh and muscle and ligament were gone, the bones separated. The lighter ones floated to shore. The lower jaw separated from the skull. The cranium rolled away, settling upside down in the muck. What was left of the boy disappeared under the silt.

Years turned into centuries, and centuries turned into millennia, while grain by grain, minerals in the sand replaced minerals in the bones, turning the bones into solid rock.

While the boy's fossilized bones remained buried, the world above changed. A drier climate transformed the landscape. The lush tropical vegetation the boy had known faded away. Where trees once wove canopies above thriving grasses, isolated weeds struggled to survive. What was once moist and green turned parched and brown. Any plant scrappy enough to grow had thorns, as if a prickly nature were necessary to survive. Unchecked rainwater cut gullies that sliced through

ancient sediments, creating walls rippling with cream, red, and tangerine.

Wind and the rare downpour peeled off layers of sand and sediment, and the boy's 1.6-million-year-old fossilized bones began to surface. Just a foot below the parched ground, the boy's sand-filled cranium held precious drops of water and became a pot for a seed. A wait-a-bit thorn tree sprouted. For 20 years the thorny tree grew. The roots snaked through the plates in the brain case and shattered the cranium. Some of the bone fragments drifted free of the roots' clutches. One tiny piece of skull poked through the pebbles.

West Turkana, Kenya, August 1984 . . .

For two weeks fossil hunters known as the Hominid Gang had worked without a break. These six fossil hunters, who had been together long before the term "hominin" had come into fashion, were trained and led by a stocky Kenyan, Kamoya Kimeu. Together they walked the lunarlike landscape. They scrambled up slopes scattered with loose pebbles, snaked the ridge-tops, catching a breeze, then dipped back into the 135-degree heat of the airless gullies. Behind them they left almost no cairns, rock piles built to mark the location of a fossil find. They'd found no hominin fossils at all—no traces of humans or human ancestors anywhere. To them this was failure. They were tired. They were discouraged. It was time to move on.

During the worst of the midday heat, the Hominid Gang set up their next camp alongside a river of sand called the Nariokotome. The first thing they did was look for water. They had to dig deeper than the year before, but they found it. Then on the bank of the dry riverbed, in the spotty shade of the acacia trees, they pitched their canvas tents. Although

they couldn't see Lake Turkana, three miles east of camp, they could make out the faint scent of the lake's rotting algae on the breeze, mixed with the closer, stronger smells of goat herds, burned grass, and sunbaked dirt.

In the intense midday heat, the bustling camp sounds—the clatter of pots and pans, the slosh of water for dishes and baths and laundry, the sound of shovels striking rock and sand—had quieted to soft restful murmurs, the even rhythms of snores, the gentle *flap, flap* of laundry drying in the breeze, and the *scratch, scratch, scratch* of pencil on paper as a few fossil hunters wrote letters home.

But Kimeu couldn't relax. Frustration prickled his normally even nature. After two weeks of staring at the ground hour after hour, day after day, they had found nothing hominin. Not even a tooth. Why hadn't they found even a sliver of hominin bone? Would their new location alongside the Nariokotome be any better? Leaving his fellow fossil hunters behind to rest, Kimeu decided to relieve his itchiness with a walk.

Heading south from camp, he shuffled down the pebbled bank of the Nariokotome, scanning the ground for fossils. He crossed the roadlike riverbed and scrambled up the other bank, following a well-worn goat path. The path wound near a small acacia tree and a large *Salvadora* tree. This wasn't a good place to find fossils. The ground had been trampled by camels and goats and the young boys who herded them. But Kimeu looked anyhow. He was 300 yards south of camp when he spotted it.

Almost anyone else would have walked right by without seeing it. But Kimeu was not almost anyone. He was a fossil hunter—the best there was. The small chunk of cranium, no bigger than a matchbook, looked just like the lava pebbles that surrounded it. Its surface was covered with pinhole pits,

hairwidth scars, and sand-grain-sized bumps. But Kimeu knew—even before he picked it up—that this was hominin.

When he rubbed it between his thumb and forefinger, he felt the thick concave curve of bone that had once protected a brain. Not the small brain of an antelope or a gazelle or a pig—the big brain belonging to a hominin. From his many years of field experience, he knew that this curve belonged to the skull of *Homo erectus,* the hominin that lived before modern humans. Turkana Boy had surfaced.

Back at camp Kimeu and the fossil hunters removed the battery from the Land Rover and hooked it up to the radio telephone. The signal was so weak that Kimeu had to yell into the receiver. The operator connected him to anthropologist Richard Leakey, who was working at the museum in Nairobi, cleaning fossils. They had found something, Kimeu hollered into the radio telephone. They had finally found something. Perhaps Leakey would like to come see?

"Keep them safe for me, and we'll see you tomorrow," Leakey replied.

Richard Leakey's friend and colleague, anthropologist Alan Walker, happened to be in Nairobi working with Leakey when Kimeu called. Walker, curious to see Kimeu's find, packed up the fossils he'd been studying and joined Leakey. They loaded Leakey's single-engine Cessna with supplies and topped off the wing tanks with fuel. Once airborne, Leakey banked the Cessna north toward Lake Turkana, Kamoya Kimeu, the Hominid Gang, and that tiny scrap of Turkana Boy's cranium.

Two hours into the flight, they reached the southern tip of Lake Turkana. The lake shimmered below them. Wind skim-

Kamoya Kimeu, head of the Hominid Gang, breaks hard-packed topsoil with a pick. This arduous task must be performed cautiously to prevent damaging the delicate fossils located beneath the surface.

ming the lake shifted the floating algae, turning the water from blue gray to jade green and back again. The brilliant jade looked all the more vibrant alongside the dull mud banks. From the air the banks looked like thick brown paint that children had run their fingers through—those finger tracks were crocodile slides.

The Hominid Gang had cleared an airstrip—a very *short* airstrip. Leakey liked them as short as possible to keep out unwanted guests. Approaching the strip, Leakey slowed the plane to just a few miles above stall speed. The slower he came in, the quicker he could come to a stop. At 1,500 feet the stall warning bleated. Leakey lifted the nose, stalling just as the tires hit the ground with a thud. The Cessna bounced,

once, twice, and then settled into a shudder as the plane rumbled against the hard brake.

When Leakey threw open the cockpit window, the men were torched by hot desert air perfumed with goat dung. "OK, Walker. Let's see what they got for us this time."

In *The Wisdom of Bones,* Alan Walker wrote, "Our hearts sank when we saw the small fossil, a rectangular piece about one inch by two inches, and the wretched little slope on the opposite side of the river." Richard Leakey wrote in his field diary that night, "Seldom have I seen anything less hopeful." But in the world of paleoanthropology, even the bleakest lead is followed. So after dinner, in a mess tent lit by lantern light, Leakey and Walker planned the excavation.

In the morning the Hominid Gang cleared the area of debris. The fossil hunters picked up leaves, twigs, pebbles, and rocks. Once the slope was clear, the gang broke up the hard-packed top layer of dirt with Olduvai picks. These tools, made from two-inch nails sticking out of carved wooden handles, fit neatly into the palms of the excavators' hands. With a steady *thwack, thwack, thwack,* the Hominid Gang broke up the crusted surface. The locals Leakey had hired to help with the excavation swept the loosened sediment, called backdirt, into metal bowls. Schoolboys, working to earn extra money, dumped the backdirt into wheelbarrows and wheeled it to the sieves.

The sieves are two-by-three-foot wooden frames with two layers of mesh attached to the bottom. The coarser layer is like chicken wire, metal with quarter-inch holes. The finer layer is similar to mosquito netting. Workers sift the sediment with a