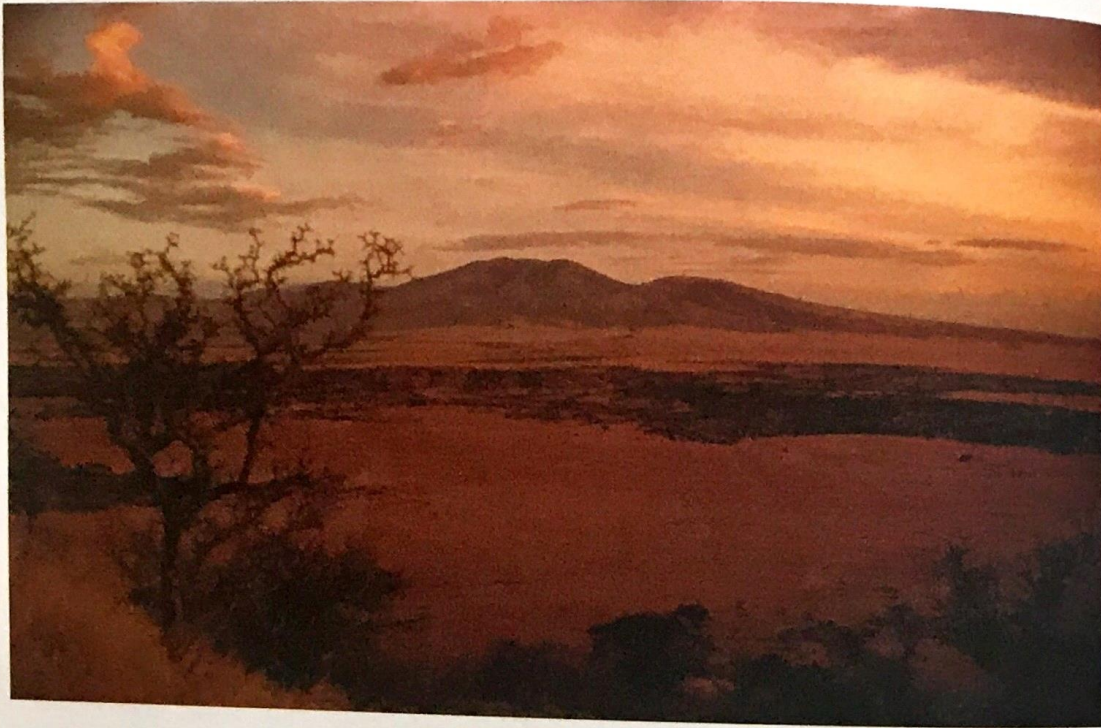


FOSSILS AND
ARTIFACTS IN
TANZANIA

STONES AND BONES

THE OLD STONE AGE



Olduvai Gorge in Tanzania is only 300 feet deep, but it has been called the Grand Canyon of prehistory because of the depth of information provided by discoveries made there.

The truck bounced over ruts, rocking wildly. Kamoya Kimeu must have tried to steady himself as best he could in the bucking passenger seat. He and the others from his village were quiet. They were headed for Olduvai Gorge. They needed the money, but they weren't sure about this thing called a "dig." They did not want to touch dead people. Like many Africans, the Kamba believed it was bad luck. Thirty years after this bumpy ride in 1960 through the **savannah**, Kimeu told Virginia Morell when she interviewed him for her book *Ancestral Passions*, "We didn't know then about hominid bones, that there were such things. I thought we were coming to dig some graves of dead people. I didn't like that very much."

A savannah is an open plain where long grasses grow. }

Kimeu trusted his uncle. If his uncle said that it was good work, it was good work. His uncle was traditional Kamba. His teeth were chipped and filed to sharp points in the ceremonial way of his ancestors, and if he said that this lady—this Mary Leakey—was to be trusted, then Kimeu believed him. His uncle might have yanked the wheel to avoid yet another water hole and sideswiped a sisal bush, its thorns scratching the side of the truck with a loud, screeee. . . . Okay, maybe Kimeu shouldn't trust his uncle's driving so much. But everything else about his uncle? He trusted everything else.

At the camp Mary Leakey stood in front of the group of Kamba workmen, speaking to them in broken Swahili, part-English, and lots of sign language. She showed them how they would remove the rocks and dirt with picks and shovels. She showed them the little tools that they would use when they had taken away the top layer. Kimeu wondered how they would break through the rock-hard, baked clay with those tiny points.

Leakey took the workers to the area she wanted to excavate. They scrambled down the slope, the loose rock rolling under their feet. The dust rose up and made them cough. Leakey motioned to them to keep coming. When they were 10 feet from the bottom of the gorge, Leakey pulled out of her pack several wooden stakes. The Kamba stopped. Were they grave markers? Is this where they would have to dig up dead people? Some of the others must have inched back up the slope away from Leakey, who was pounding the stakes into the ground. Behind him, Kimeu would have heard the unsettled murmurs. As Leakey hammered, she explained that this was where they would dig the first trench.

Trench? Not grave?

Leakey probably reminded them of the food and the blankets that she would provide and the 10 dollars a month they would be making. The Kamba probably remembered that they were there because they needed the money for their families back home. So far they had not seen a dead person. Maybe it wouldn't hurt to dig rock and sand. It would be all right to touch the bones of an antelope. And so they dug.

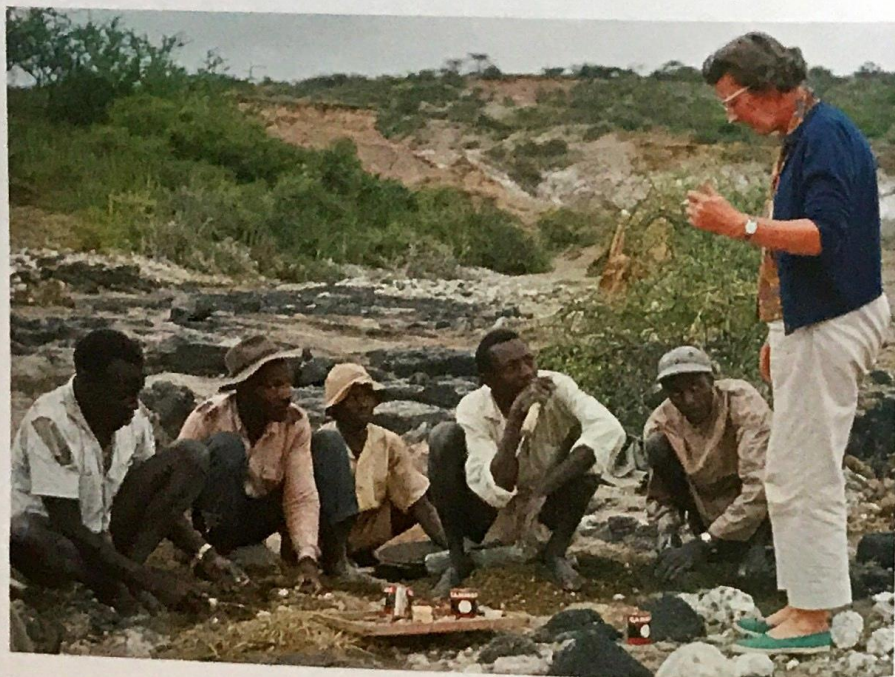
NEW USE FOR OLD NAILS

The Kamba invented their own tool for breaking up the soil at early sites. They carved a wooden handle that fit nicely and felt comfortable in their grip. Then into the opposite end they hammered a six-inch nail, flattening it into a sharp chisel. The "Olduvai pick" is now in many East African archaeologists' tool kits.

At night the Kamba workmen sang songs and told stories around a campfire. Mary Leakey didn't join them. She sat alone at a worktable outside her tent, writing in her journal by the light of a lantern. She drew pictures of the fossils. She sketched the artifacts she found each day in the excavations. She wrote long letters to her husband, Louis Leakey, who was also an anthropologist. She planned the next day. She was there to work. Kamoya Kimeu watched her. She was so serious, this white lady. The days were long and hot. The Kamba crew removed tons of rock and soil. Kimeu told his interviewer, "We made a line with our shovels and picks and then we started digging. Then to make it go fast, we sang a Kamba song we always sing when we start to make a new *shamba* (garden). But Leakey said, 'What is this? This is not a potato *shamba*! Stop that singing!'"

Leakey wanted them to pay attention to what they were doing. She didn't want them singing. She didn't want them talking either. "*Yamaza!*" she would shout—"silence," in Swahili.

In the evenings the Kamba imitated Leakey and laughed. They strutted around the campfire, shouting orders in a



Mary Leakey instructs her workmen at Olduvai Gorge. The man on the far left is Kamoya Kimeu, who later was honored by the National Geographic Society for discovering more hominid fossils than any other person. The fourth man from the left is holding an Olduvai pick.

HOW DID THAT HAPPEN?

To reconstruct a picture of how ancient hominids lived, archaeologists must interpret a site by the position of the stone tools in relation to the animal bones, to the terrain, to the hominid. The archaeologist must piece together a picture of what was.

You've seen news reports on television in which people's homes are inches deep in muck after a flood. Stone Age areas have been covered in the same way. The problem with moving water is that it can disturb the evidence. Was this stone tool left next to this bone? Or has nature jumbled it all up?

As archaeologists strip the excavation layer by layer, they plot each find on a three-dimensional graph, then label and catalog it, keeping meticulous records. They are always paying attention to the relationship between objects and their environment, asking—is this how it was left a million years ago?

high-pitched voice. Kimeu glanced over now and again from the campfire where they spent their evenings to the worktable where Leakey spent hers. She was so serious, this white lady.

The Kamba women were not like Leakey. Leakey was *kali mzungu*—prickly white—and she was the boss in her household, not her husband. Not all the Kamba men thought that this was right. Many quit and went home. They did not want a woman to tell them what to do—especially this *kali mzungu* woman. But Kimeu did not quit. He stayed. He watched. He learned.

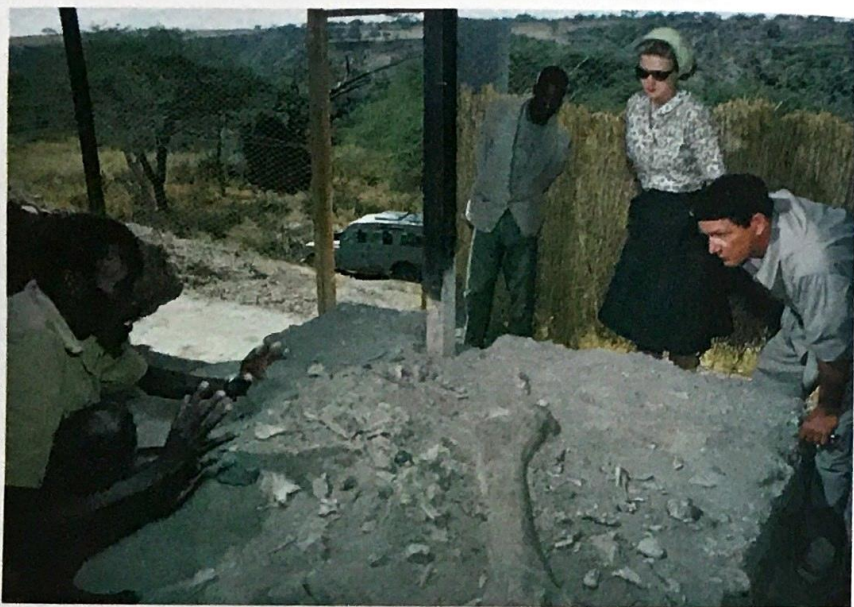
There were days when Leakey was in a good mood and explained to them why they were not to move the bits of bones and stones they found. She showed them how she pinpointed the location on a map of each fossil bone and tooth and each flake, core, and hammerstone. Kimeu said, "If Mary was not *kali* I'm sure we would not learn. So everybody was working hard, running hard, studying hard." No one worked harder than Kimeu and Leakey.

The crew dug. Leakey dug. They dug six-foot-wide steps, creating a staircase that went down four stories. The cut in the hillside revealed layers. The deeper they dug, the older the layers. In the middle, 20 feet down, they found the layer Leakey had been searching for, a layer nearly 2 million years old. Leakey called it the living floor. It was where the hominids had gathered.

The artifacts and fossils in the living floor were stuck under a thick layer of rock-hard volcanic ash. How could they get to them without destroying them? Leakey ordered the workers to pour water over the slab to loosen the ash. The workers poured gallon after gallon on the ash. But water is precious in the desert. The workers' angry murmurs grew into grumbles, then into loud complaints. Wasting water was bad luck. At night they stood in line for their water rations. A small cup was all that they were given to bathe. Meanwhile, Leakey ordered them to pour more water over the ash.

The volcanic ash began to loosen. The fossils and artifacts poked through unharmed. Leakey and the Kamba found

- 64 Fossils and artifacts, Olduvai, Tanzania, 1.75 million years ago



Stone tools lie beside the bone of an extinct elephant in this block, which is just the same as it was when the Leakeys excavated it in 1960 at Olduvai Gorge.

3,150 large fossils, several thousand small bone fragments, 2,470 large stone tools, and 2,275 stone flakes. Leakey painstakingly labeled and mapped each find. This was the living floor. This was the place where hominids gathered nearly 2 million years ago. She hoped to understand what they did in this place by looking at what they left behind. Kimeu watched this serious, *kali mzungu* lady, day after day, for months. She scratched through the fawn-colored dirt, sketched in her notebook, and barked out her orders.

She seemed particularly interested in one area. It was an area where piles of smashed animal bones and many tools and flakes were scattered. Kimeu thought it looked like many animals had been butchered there. The sharp stones could have been used to cut through hides and carve animal meat. The more rounded stones could have been for smashing the bones to get at the marrow inside. Not far away was another area, oval-shaped, also thick with remains. Between the two areas was an empty narrow strip. Why was this strip empty? And why were there *two* groups of bones?

Had hominids gathered together to eat the meat of an animal they had hunted or scavenged? Leakey imagined them

making tools, butchering animals, and smashing the bones for marrow. Marrow! The bones in the oval area were bones that didn't contain much marrow—ribs, jawbones, and backbones. What if the strip had once been a line of bushes? The hominids could have tossed the bones without marrow over the bushes and kept the bones with marrow to smash when they had finished the butchering. From the bones left behind, Kimeu realized that hominids liked to eat antelope. The bones were not so different from the antelope he himself had hunted. But he also could see that they ate things that were easier to catch. They ate tortoises and chameleons and lizards and fish and snails. Kimeu didn't see any of the black rings that are left by a cooking fire. They must have eaten their food raw.

What were the hominids doing there? How were they using these places where they made tools and butchered animals? Were these home bases? When Mary Leakey excavated Olduvai Gorge in 1960, archaeologists thought areas containing bones and stones were 2-million-year-old campsites.

The hominids could have stayed at the campsite for a few days or several months. The group shared food and made tools. When the food became scarce they would pack up and move on to another site. Later, archaeologists worried that if they called these sites “home bases,” then people would imagine a “home,” when in fact there was no dwelling at all. They renamed them “central foraging places,” hoping that name better described the way hominids lived.

Some scientists believed the sites were just places that hominids had found a dead animal and ate it. There was no food sharing. They just came across a carcass, smashed bones for the marrow, and then moved on.

Other scientists imagined the sites as tool storage areas spread around the hominids' territory. Hominids would carry a carcass to the nearest meat-processing place, where they kept a supply of stone tools. They would butcher the animal quickly, abandoning it before dangerous meat-eating animals, carnivores, were drawn to the area by the smells of the kill.

HOW TO SKIN AN ELEPHANT

Scientists experimented with stone tools to see what it was like to use them to butcher an elephant. (They experimented only on elephants that had died natural deaths.) Using a stone tool to cut through tough elephant hide is like slicing through a car tire with a razor blade. But once they get through the thick skin, the stones cut the meat easily. The scratch marks on the bones at Olduvai Gorge look like they were made with the knifelike edge of stone tools.

EXTRA FAT WITH YOUR MEAT?

Wild game has very little fat, and yet, we need fat to digest protein. Hominids ate bone marrow because it is rich in fat. Carnivores gnaw and crunch bones to get the marrow, like a dog chewing a bone. Early Stone Age hominids struck thick bones with stone tools, breaking them open and scooping out the marrow inside.



Louis and Mary Leakey and their son, Philip, excavate fossils and artifacts at Olduvai Gorge in 1960. Mary's dogs seem bored by the work.

Or maybe the hominids used the site because it was a good spot to butcher food, eat, socialize, and rest. They chose the site because it was shady, or safe from predators. There was no real plan to store tools—it just happened over time. One of the most difficult detective jobs that an archaeologist studying hominids has is to reconstruct how hominids lived. Was it picturing hominids so long ago that snagged Kimeu? Was it then that he caught the fossil fever? Or was it when he touched his first fossil? Perhaps it was that leg bone just outside the oval where hominids met so long ago—the hominid leg bone that was short and slender. When he touched it, he did not feel the dread of bad luck. He felt the thrill that he would find more.