

CONNECT THE DOTS PEOPLING THE GLOBE

44 HOMINID AND ANIMAL BONES AND TOOLS IN THE REPUBLIC OF GEORGIA, SOUTH AFRICA, SPAIN, AND CHINA

Homo erectus = "man" + "upright"
This is the oldest species to be found outside Africa

If *Homo erectus* had learned to play a game, it would have been the one where everyone scatters the second the person who is "it" closes his eyes. Almost as soon as they appeared in Africa nearly 2 million years ago, *Homo erectus* spread out. They were hominids on the move.

Homo erectus looked a lot like us. Dolphins aren't as close to porpoises as we are to *erectus*. But don't let the similarities fool you: they were hulking hominids when it came to power. Anthropologist Alan Walker calls *Homo erectus* the "velociraptor of its day." And if you were to bump into one—run—because, Walker says, "you wouldn't connect. You'd be prey."

Just as we do, *erectus* walked with an upright, long-legged stride. It was a stride that carried these hominids over many generations across continents. Those legs took them up and

down mountains, across deserts and rivers. That stride gave *erectus* hominids what anthropologist Ian Tattersall calls "a career as long-distance travelers." And, as Tattersall claims, *erectus* had the adventurous nature that is typically human. Their big brains helped them adjust to new climates, new foods, and new landscapes as they journeyed away from the familiar and into the unknown.

Anthropologist Alan Thorne explains how many other scholars see hominids moving out of Africa: "Humans came out of Africa in two waves—a first wave of *Homo erectus*, ... and a later, more advanced wave of *Homo sapiens*, which displaced the first lot."

The problem in tracking the early hominids' exit is the lack of fossils. There are only scattered fragments from the scattering hominids. Alan Thorne points out how spotty the evidence is outside of Africa. "The whole of India has yielded just one ancient human fossil, from about 300,000 years ago. Between Iraq and Vietnam—that's a distance of some 3,000 miles—there have been just two. . . . It's not surprising that paleontologists have trouble connecting the dots."

Trying to figure out how hominids moved out of Africa and throughout the world is like playing a detective tailing a suspect. Scientists put together clues they uncover at digs and try to connect those dots. Most scientists agree that sometime between 2 and 1.5 million years ago, it was *Homo erectus* who got restless. *Erectus* started by spreading over most of Africa, then moved into southern Asia and finally the warmer parts of Europe. Here are a few of the scattered clues and the dots they may connect:

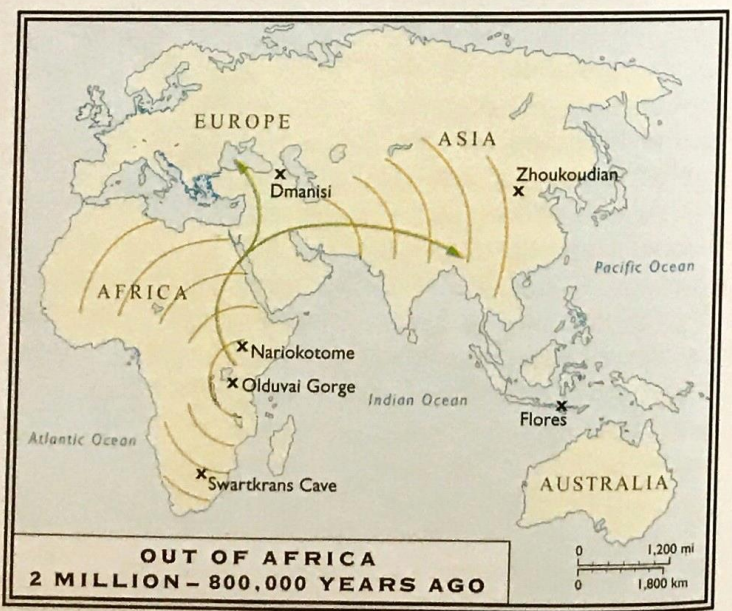
Clue #1 comes from Dmanisi in the Republic of Georgia, at the gates of Europe. Scientists found the skull of a trailblazing teenager who lived 1.75 million years ago. The skull and bones of at least five other individuals are the earliest evidence—so

MOVING MOMENTS IN THE LIFE OF HOMO ERECTUS

1.75 million years ago
Erectus migrates out of Africa

1.25 million years ago
Fire used at Swartkrans Cave

800,000 years ago
Gran Dolina Boy migrates into western Europe; *Erectus* migrates over water

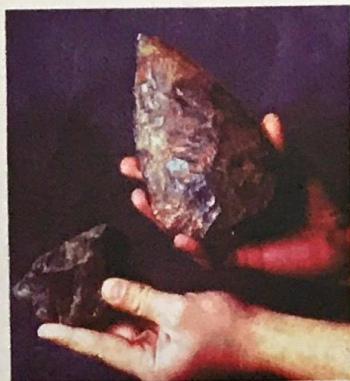


The arrows show the directions *Homo erectus* migrated out of Africa. The arcs show how local populations spread outward over time as they grew.



44 *Homo erectus* skull, Dmanisi, Republic of Georgia, 1.75 million years ago

64 Tools, Dmanisi, Republic of Georgia, 1.75 million years ago



The tool on the left was excavated at Dmanisi. Hand axes such as the one on the right have been found with *Homo erectus* fossils at other sites.

found African animal remains at Dmanisi, too. Ostriches and short-necked giraffes had taken the trip. When *erectus* made their way into Dmanisi it was a bit like East Africa, with its shrinking forests and expanding grasslands. The hominids and the animals were still in fairly familiar surroundings. Competition for food could have pushed these



Archaeologists hung strings from the roof of Swartkrans Cave in South Africa to form a grid. The lines help excavators map the locations of fossils in this limestone cave.

far—of hominids outside Africa. The simple tools that they made from rocks gathered in nearby rivers were found with them.

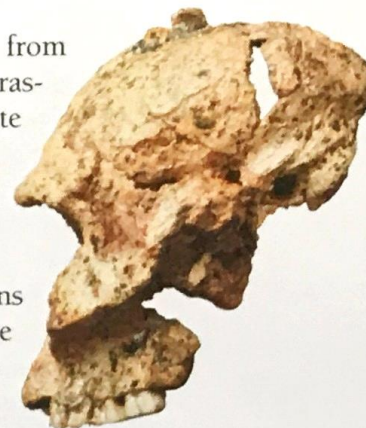
The big brain that scientists expect to see in hominids, who needed it to figure out how to survive in new places, hadn't really developed for this primitive *Homo erectus*. But maybe they didn't need it yet. Scientists

hominids farther and farther from home without forcing them to drastically change what food they ate or how they managed to get it. They could still get by without big brains. And now they had longer legs made for walking.

Clue #2 comes from Swartkrans Cave in South Africa. It was here that scientists found the bones to prove that we were not always the only hominid on the planet, as we are today. ***Australopithecus robustus*** lived alongside *Homo erectus* between 1 and 2 million years ago. That clue led scientists to understand that we didn't evolve in a straight line, one hominid evolving into another hominid into human beings, but that there were other branches of hominids. There were hominids not related to us—hominids who died out without a descendant.

As *erectus* spread into colder climates, they needed something for warmth. They needed **fire**. The first convincing evidence that a hominid actually used fire was in Swartkrans Cave between 1 and 1.5 million years ago. Someone—was it *erectus* or *robustus*?—grabbed a burning branch from a grass fire and brought it back to the cave. At some point they cooked part of an antelope—the world's first known barbecue. The hominid at Swartkrans didn't actually start the fire. Lightning probably did that. Total control of the flame was still a ways off.

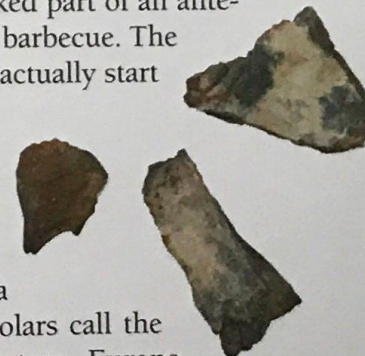
Clue #3 comes from the underground tunnels and limestone caves of Gran Dolina in northern Spain. Some scholars call the hominids who reached western Europe 800,000 years ago *Homo antecessor*. Scientists named one hominid Gran Dolina Boy. He was around 11 when he died.



64 *Australopithecus robustus* skull, (part of the crest of bone along the top of this skull has broken off), Swartkrans, South Africa, 1.5 million years ago

Australis + *pithekos* + *robustus* = "southern" + "ape" + "robust"
Just to confuse you, this robust South (African) ape is a hominid, not an ape.

The earliest indisputable evidence of hominids fully controlling fire comes from hearths in Europe dating back 400,000 years. Scientists disagree about patches of baked earth on earlier sites. Were the fires started naturally by lightning? Or were they started by hominids?



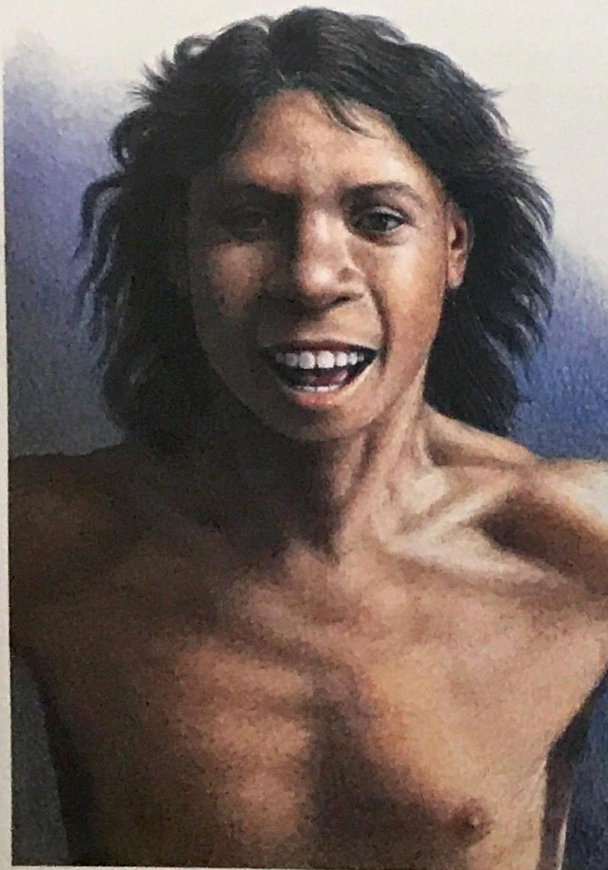
64 Burned animal bones, Swartkrans, South Africa, 1.25 million years ago

antecessor = "one who goes before"
The anthropologists who named this species think it is the ancestor of later humans.

66 *Homo antecessor* skull, Gran Dolina, Spain, 800,000 years ago



66 *Homo antecessor* arm bone with butchering marks; Gran Dolina, Spain; 800,000 years ago



An artist drew this picture of Gran Dolina Boy from what his fossilized bones suggested he would look like. But we don't actually know what hairstyles hominids preferred.

These hominids must have worn the skins of the animals they butchered to protect themselves from the cold. Thousands of butchered animal bones were found along with the simple flakes and chopping stones the hominids used. But these hominids were not only eating animals. Butchery cut marks were found on hominid bones. The marks show these hominids were eating each other. These are the first known cannibals.

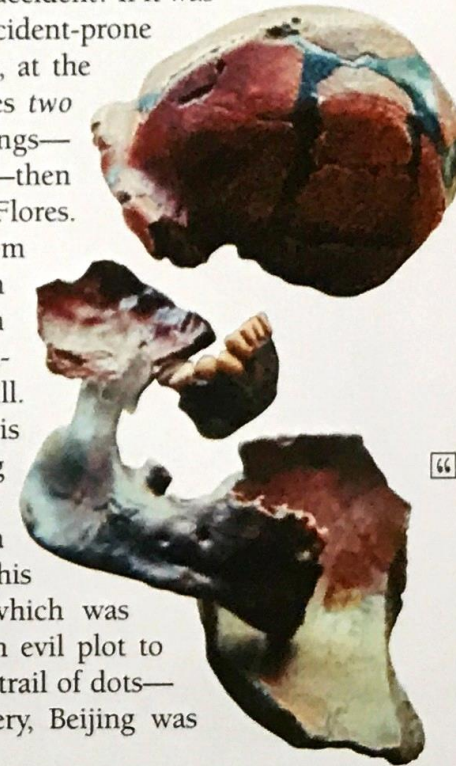
Clue #4 comes from the Island of Flores in Indonesia. No one knows who lived there. Only tools remain. Scientists found the tools with the bones of an extinct pygmy elephant. Since that particular species of elephant was no longer around 750,000 years ago, the tools had to be at least that old. Scientists dated the layer of volcanic rock where the tools were found. The layer is 800,000 years old.

Up until then scholars had not found any evidence that hominids had crossed deep water before 50,000 years ago. So, finding 800,000-year-old tools—on an island—was a shock. Somehow hominids had crossed water to arrive on the

Island of Flores. Did they lash bamboo together with reeds and raft across? Was the trip intentional? Or did they float over on a tree limb quite by accident? If it was an accident, we have one accident-prone *erectus*. The closest crossing, at the lowest of sea levels, requires two ten-mile-minimum crossings—from mainland to island—then from island to the Island of Flores.

Clue #5 comes from Zhoukoudian Cave in China. The cave is nestled in the mountains on the northern slope of Dragon Bone Hill. The *erectus* found there is called Peking Man. Peking Man lived about a half million years ago. Peking Man was named for the place this *erectus* was first found, which was near Beijing. This is not an evil plot to throw our detective off the trail of dots—at the time of the discovery, Beijing was called Peking.

By half a million years ago, *erectus* hominids were showing off their big brains. China is a long way from where *erectus* started out in East Africa so many—about 125,000—generations ago. Along the way *erectus* must have met many challenges. New environments require new methods to survive. They couldn't have made the trip without the reasoning powers their growing brain provided. And with meat a major part of the hominids' diet, they no longer were tied to the plant life of a particular area. They were free to move, and move they did. *Homo erectus* ate whatever they could find—roots, berries, shellfish, eggs, nuts—and meat. We can tell from the wear on their teeth that these hominids ate more meat than their ancestors did. A big brain requires lots of energy, and meat is a high-energy food. It couldn't have been an easy life though. There must have



66 *Homo erectus* skull, Beijing, China, 500,000 years ago

HOMINID HANGOUTS

Despite what popular images would have you believe, our ancestors were not cavemen. They lived outside caves more often than in them. Caves just happen to do a good job of preserving whatever is in them. The overhang protects whatever is inside from weather that might destroy it.

In the 1930s in Zhoukoudian, China, excavators carry a basket filled with rubble from the site to be sifted. The excavators mapped where they took each basketful according to the grid lines, similar to marking a box on a piece of graph paper.



been many hardships, many times of hunger, and lots of danger, because most *erectus* hominids never lived to be older than 14.

There is one mystery that our detective may never solve. During World War II, Chinese scientists packed up the bones of Peking Man and sent them off by train guarded by nine United States Marines. The bones were supposed to be loaded onto a steamer headed for the United States for safe-keeping. The train arrived at the port serving Peking the day the Japanese bombed Pearl Harbor. Amid the chaos of the war, the fossils were taken prisoner, and the bones disappeared. Years later, a mysterious American woman claimed she had possession of the kidnapped Peking Man. She demanded a ransom of half a million dollars. But when it came time to exchange the bones for the money at the designated location—on top of the Empire State Building—she ran. No one has found a trace of the mystery woman or Peking Man. Only the casts of the fossils remain to compare to all the other *erectus* fossils found since then—in China and along the many trails that connect the dots on the way out of Africa.