Ancient Apes May Have Branched Out

A partial skeleton of a 15-million-year-old African ape—painstakingly excavated, prepared, and analyzed over the past 5 years—represents a new fossil genus in the primate family that includes great apes and humans, according to its discoverers. Their conclusion adds to a growing conviction among researchers that ancient apes branched out in more evolutionary directions than had previously been appreciated.

Scientists, however, express a range of opinions about how to classify the new fossil ape. The find, reported in the Aug. 27 SCIENCE, also shows no signs of cooling off scientific controversy about whether fossil apes within or outside of Africa served as ancestors for modern apes and humans (SN: 4/19/97, p. 240).

The team that unearthed the skeleton assigns it to a new genus, *Equatorius*. The find also leads Steve Ward of Northeastern Ohio Universities College of Medicine in Rootstown, Andrew Hill of Yale University, and their colleagues to reassign one of two *Kenyapithecus* species—African fossil apes that lived from around 15 million to 14 million years ago—to *Equatorius*.

The new specimen and previously excavated remains of *Kenyapithecus africanus* share facial and dental features that appear much more exaggerated in the handful of fossils assigned to the species *Kenyapithecus wickeri*, the researchers contend.

"We now have to figure out where *Equatorius* fits into subsequent ape evolution," Ward says. "I suspect that there were separate movements of *Equatorius* and *Kenyapithecus* out of Africa."

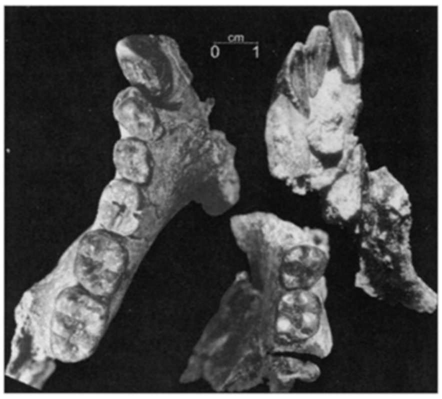
In 1993 and 1994, Ward and his coworkers recovered blocks of hard clay containing the partial skeleton from the Kipsaramon site in central Kenya. It took 3 years to remove the bones intact from their rigid casing, followed by more than a year of skeletal analysis.

The skeleton, from an adult male, includes a lower jaw retaining most of its teeth, two teeth from the upper jaw, and bones from the spine, chest, shoulders, arms, wrists, and fingers.

Equatorius exhibits signs of having inhabited a position at or near the evolutionary root of modern apes and humans, Ward and his colleagues hold. In their view, some of its anatomical features look like those of African apes dating to as early as 22 million years ago.

However, *Equatorius* also displays evidence of having frequently moved about on the ground, much like later fossil apes, Ward says.

The decision to fold *K. africanus* into the new genus received further confirmation, he notes, from the observation of dental similarities between *K. wickeri* and an unnamed fossil ape species of about the same age previously unearthed in Turkey. The nature of the link between African and Eurasian apes at that time remains poorly understood.



SCIENCE

Jaw and tooth remains of African fossil ape proposed to embody a controversial new genus.

"The description of this new genus is long overdue," comments Peter Andrews of the Natural History Museum in London. "Until now, *Kenyapithecus* has been a waste-bin [genus] into which people put all sorts of fossils."

Equatorius may have been ancestral to later African apes, or even to all modern apes, Andrews suggests. On the other hand, *K. wickeri* sits on an evolutionary side branch that eventually ended in extinction, he says.

Eric Delson of Lehman College, City University of New York doubts that enough evidence exists to justify the proposed new fossil-ape genus. *Kenyapithecus* finds—especially those of *K. wickeri*—remain too scarce for the extensive comparisons needed to establish the existence of *Equatorius*, he asserts.

Brenda R. Benefit of Southern Illinois University in Carbondale, who with Illinois coworker Monte L. McCrossin directs ongoing Kenyan excavations of *K. africanus* fossils, rejects the analysis of Ward's group. The new specimen exhibits no traits that separate it from *Kenyapithecus*, she argues.

In contrast to Ward's view, recent finds of *K. africanus* indicate that the species bears substantial dental similarities to *K. wickeri,* according to Benefit.

Several partial skeletons of a 15.3-million-year-old African fossil ape were recently recovered by a Japanese team at another Kenyan site and described in July at a conference in Kyoto. Most scientists at the conference accepted the finds as a new genus distinct from *Kenyapithecus*, says Benefit, who attended the Kyoto meeting.

No one in Ward's group attended the Kyoto conference, and the group hasn't yet compared its find with the Japanese team's. —*B. Bower*

Turkish earthquake: A wobbly domino falls

The tremor that turned life upside down in northwest Turkey last week has helped to put an earthquake theory on more solid footing, according to seismologists who anticipated the disaster.

The magnitude 7.4 quake occurred near the western end of the North Anatolian fault, a 1,200-kilometer-long tear extending across the northern part of Turkey. Unrest along this fault stems from the slow-motion collision between Arabia and Eurasia, located on either side of Turkey. As these two giant pieces of Earth's outer shell crash together, they force the diminutive Anatolian plate carrying Turkey out of the way.

During quakes, the bulk of Turkey moves westward relative to land north of the fault. "It's kind of like a watermelon seed being squeezed," says Lynn R. Sykes of Columbia University's Lamont-Doherty Earth Observatory in Palisades, N.Y.

After several centuries of building pressure, the seed started slipping in 1939. In that year, an earthquake estimated at magnitude 7.9 ruptured the crust along the eastern third of the fault, killing some 30,000 people. Between 1942 and 1967, the fault generated six large shocks progressing westward toward Istanbul like a line of falling dominoes. Last week, the next patch of the fault toppled beneath the city of Izmit.

Well aware of the pattern, seismologists have long warned about the possibilities of earthquakes in this area. In recent years, scientists started exploring why this series of shocks has stepped so consistently down the fault.

In 1997, a team of U.S. and Turkish researchers proposed that each tremor along the North Anatolian fault helps set off the next one. Scientists had developed this idea, called stress triggering, while studying progressions of California quakes.

When the two sides of a fault jerk in opposite directions during a tremor, it relieves stress that had built up over decades or centuries. At the same time, however, it adds stress to some neighboring patches of the fault, says Ross S.