

Skull Gives Hominid Evolution New Face

A 2.5-million-year-old fossil skull recovered in East Africa last year is causing paleoanthropologists to reconsider ideas about the sequence of evolutionary changes and who is related to whom among the earliest species of hominids, or humanlike creatures.

The discovery, reported in the Aug. 7 NATURE, represents the oldest known hominid not directly related to modern humans. The skull was found in a gully west of Kenya's Lake Turkana by Alan Walker of Johns Hopkins University School of Medicine in Baltimore, who analyzed the specimen with Richard Leakey of the National Museums of Kenya in Nairobi, John M. Harris of the Los Angeles County Museum of Natural History and Frank H. Brown of the University of Utah in Salt Lake City.

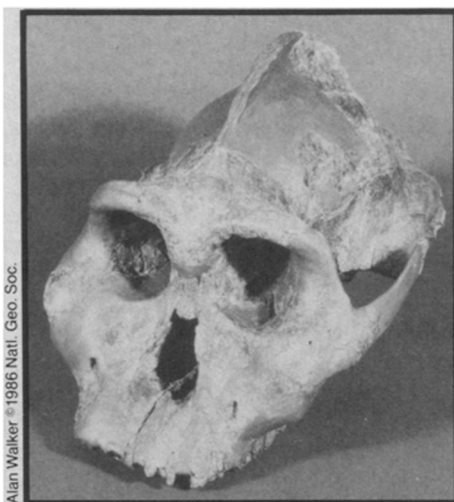
Although there are still different interpretations regarding the shape of the human family tree over the past 4 million years, the new find challenges the view that two lines of australopithecines, one of which led to modern humans, branched out from a single species known as *Australopithecus afarensis*. The latter species includes the famous skeleton "Lucy," which was discovered in Ethiopia by Donald Johanson of the Institute of Human Origins in Berkeley, Calif., and his colleagues more than 10 years ago.

"This is the most exciting specimen since Lucy," says Eric Delson of the City University of New York.

Walker and his co-workers hold that the cranium is either an early member of the species *Australopithecus boisei* or part of a new species clearly related to *A. boisei*. Previously, *A. afarensis* was seen by many paleoanthropologists as leading, in one direction, through three progressively larger species: *africanus*, *robustus* and *boisei*, which marked the end of the genus *Australopithecus*. In the other direction, *afarensis* led to the genus *Homo*.

But it now appears that *A. africanus*, which has been found only in southern Africa and is estimated to have arisen between 2.5 million and 3 million years ago, was a contemporary of *A. boisei*. The investigators suggest that *boisei* was a separate line evolving in parallel with the *afarensis-robustus* line.

The new specimen has the typical protruding snout and flared cheekbones of later *boisei* skulls, dated at between 1.2 million and 2.2 million years old. But the researchers note that the skull contains primitive characteristics similar to *A. afarensis*, such as a flat cranial base and a bony crest running over the top and down the back, presumably used to an-



Reconstructed skull, found last year, of 2.5-million-year-old hominid.

chor the muscles of its protruding jaw. Furthermore, its brain is the smallest of any fossil hominid measured to date.

The primitive features of the skull suggest, according to the scientists, that the early *boisei* may even have existed at the same time as some of the *afarensis* specimens that have been uncovered. This interpretation fits into the assertion of Todd Olson of the City University of New York that there are two species in the *A. afarensis* remains, one of which is a large-boned "robust" australopithecine similar to that represented by the new cranium. Other researchers recently concluded that *A. afarensis* gave rise to *A. africanus*, which then led to *Homo* and robust (*A. robustus* and *A. boisei*) forms. Leakey holds that the common ancestor of australopithecines is older than *A. afarensis* and has yet to be found.

In a commentary accompanying the NATURE article, Delson wades into this confusing picture with his own interpretation of hominid evolution based on the new find. "This may well be a new species," he says. He speculates that *A. afarensis* split into two lines, one becoming *A. africanus* and later evolving into modern humans, the other becoming the species represented by the new skull, which then split to form the two "dead-end" species, *A. robustus* and *A. boisei*.

The mixture of features on the specimen discovered by Walker—a relatively advanced face combined with a primitive cranium—is an unexpected twist. "We couldn't have predicted how this animal would look from what we already knew," says Delson.

Paleoanthropologist David Pilbeam of Harvard University finds the new skull "exciting and quite interesting," but points out that the fossil record in East

Africa prior to 2 million years ago is sparse and discourages definitive interpretations of hominid branching. In addition, he notes that *A. africanus* specimens are not well dated and these hominids may not have existed in East Africa at the same time as Walker's specimen.

"This skull may represent a new species, but in any case it is very similar to *A. boisei*," says Pilbeam. "The analysis [of Walker and his colleagues] seems to document the robust lineage at least as far back as 2.5 million years ago."

Pilbeam adds that the find challenges the growing view that a worldwide climatic change around 24 million years ago spurred the evolution of robust australopithecines. A cooling trend is thought to have caused a shift in Africa toward more open, savanna-like habitats, resulting in the appearance of many new animals. The Lake Turkana specimen, however, predates the estimated time of the climatic change.

"This raises the whole issue of what drives species change," says Pilbeam. "At this point, it would be impossible to say what caused hominid speciation."

— B. Bower

Pill cleared of breast cancer role

More than 20 years after the introduction of oral contraceptives in the United States, it seems that—with the possible exception of one subgroup of women—the pill has not increased women's risk of breast cancer.

The findings come from the largest study to date on the subject, released in the Aug. 14 NEW ENGLAND JOURNAL OF MEDICINE. Caveats and questions remain, but, says an accompanying editorial, the study as a whole should reassure physicians and pill users.

Because there is a great deal of evidence that hormones play a part in causing breast cancer, the use of oral contraceptives, which are based on hormones, has long been a matter of concern. Hormone-related factors such as age at first menstruation or first full-term pregnancy, for instance, can affect a woman's risk of breast cancer throughout her lifetime.

Though most investigations have given the pill good grades regarding breast cancer, some have raised questions about subgroups of women who might be at particular risk—women who use certain types of birth control pills, or women who have used the pill be-