Early Human Skeleton Apes Its Ancestors

Homo habilis is considered to be the first truly human species and earliest tool user, appearing in southern and eastern Africa between 2 million and 1.6 million years ago, but you would not know it from the neck down. Now, the first limb bones clearly associated with skull fragments of a single *H. habilis* individual have been found, report scientists in the May 21 NATURE. The remains suggest that members of the species had unexpectedly small, apelike bodies attached to the more delicate faces and larger brain cases typical of the *Homo* line.

The fossils, uncovered last summer in Tanzania's Olduvai Gorge, belong to an adult female who had long, heavily built arms and stood somewhere between 3 and 3 1/2 feet tall, according to the 10-member scientific team. The project was directed by Donald C. Johanson of the Institute of Human Origins in Berkeley, Calif.

"What we see is a creature whose body size and anatomy are strikingly similar to Lucy's," says anthropologist and expedition member Tim D. White of the University of California at Berkeley. "Lucy" is a 3.3-million-year-old partial skeleton discovered in Hadar, Ethiopia in 1974 by Johanson and White. Lucy is widely considered to be a female member of the first humanlike species, *Australopithecus afarensis*, which appeared around 4 million years ago and eventually gave rise to *H. habilis*. It is estimated that Lucy stood about 3 feet 8 inches tall.

The assumption of some paleoanthropologists that, beginning with *A. afarensis*, body size increased gradually along with brain size, appears to be mistaken, say Johanson and his colleagues.

The teeth of the partial skeleton are as big, relative to body size, as Lucy's, say the researchers. Previous studies of isolated *H. habilis* remains concluded that the size of its cheek teeth had shrunk compared to the australopithecines.

The discovery that *H. habilis* had such a primitive build 1.8 million years ago, combined with evidence of a taller and more modern-looking *H. erectus* 1.6 million years ago (SN: 10/27/84, p.260), points to an "abrupt transition" between these two species in eastern Africa, say the researchers.

The new specimen was identified by examining the lower face bones and palate, including four teeth, and making comparisons to previously uncovered *H. habilis* skull fragments. Important information about the body came from measurements of a thigh bone and all of the bones of one arm.

Nevertheless, says anatomist Bernard Wood of Liverpool (England) University in the same NATURE, "the new find rudely exposes how little we know about the early evolution of *Homo*." The species designation for *H. habilis* was first proposed more than 25 years ago, but it remains poorly represented in the fossil record.

Previous studies, says Wood, indicate that there are two subgroups of fossils labeled *H. habilis*, one with large brains, teeth and jaws, the other with smaller brains and more lightly built faces. The new find, he says, does not resolve whether these subgroups represent males and females of one species or separate species.

White acknowledges that the issue is not settled, but adds that the consensus among paleoanthropologists is for two sexes, not two species. "The same level of variation in size between the sexes at Hadar [the female Lucy as opposed to larger male specimens] characterizes the known *habilis* specimens," says White. "A fundamental aspect of early hominid anatomy may be high levels of sexual dimorphism [size differences between the sexes]."

Characteristics other than size show that *H. habilis* was a "mosaic creature," he says, with facial anatomy evolving in the human direction and limb proportions like those of much earlier ancestors.

– B. Bower

Institute of Human Origins

Homo habilis *fossils found in Tanzania last summer.*

Spider's perfume fatal for moths

For certain male moths, bolas spiders can be the ultimate cold shower. New results of field studies confirm that the bolas spider first attracts a male moth by emitting odors reminiscent of the sex pheromones released by female moths. As the moth is drawn to what it thinks is the flame of passion, the spider flicks its sticky, bolas-like webbing – a silken strand with a drop of glue at the end – and reels in the moth for a decidedly nonsexual meal.

Scientists have suspected that bolas spiders can release chemicals similar to female moth pheromones because the spiders capture and eat only male moths. Now researchers have the first chemical evidence that this is actually the case.

In the May 22 SCIENCE, Mark K. Stowe of Harvard University and James H. Tumlinson and Robert R. Heath of the U.S. Department of Agriculture in Gainesville, Fla., report that they have identified three compounds released by bolas spiders, and the compounds are identical to the chemical constituents of some moth sex pheromones. According to Stowe, other examples of chemical mimicry in nature include orchids, which use pheromone-like odors to entice pollinating bees and wasps. But spiders are the only known example of a predator using such odors to lure prey. And unlike the moths, the orchid-seekers, he says, "live to tell the tale."

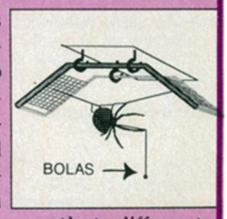

Illustration: Stowe et al./SCIENCE

The researchers found that the composition and ratio of different compounds in the "perfumes" collected from groups of spiders changed with time. This may mean that different spiders emit different blends of chemicals, or, as Stowe suspects, that individual spiders are able to change their blends. In future studies they plan to monitor spiders individually.

Stowe and his colleagues hope that these and other studies will provide new insights to the ecology and evolution of the insect world and help agricultural scientists to develop better ways to control pests. For example, moth pheromones are used to attract and monitor moths so that insecticides can be applied more judiciously, according to Stowe. Farmers can also permeate a field with pheromone-like odors so that male moths can't find and mate with females. An advantage of exploiting the smells of nature, he says, is that insects are less likely to develop a resistance to compounds they've been responding to for a long time.

Scientists, he says, "are only now beginning to appreciate and understand nature's chemical library involving organisms that mimic odors."

– S. Weisburd