Littlefoot: Hominid Tracks in Time?

After the smoke and dust had cleared, and after the last of the volcanic ash had settled, the inhabitants gradually made their way back to the local watering hole. The fire- and ash-spitting volcanic eruption was just another mysterious event in the lives of our earliest ancestors. But what was their natural disaster may have been a stroke of luck for us. After nearly four million years, natural erosion has uncovered tracks and footprints left in the then soft volcanic ash by numerous animals and possibly by a hominid or human-like creature. The tracks were discovered in 1976 by Mary Leakey and her team working at Laetolil, 30 miles from Olduvai Gorge, in northern Tanzania. The find was announced last week in Washington at the National Geographic Society, which has been funding Leakey's work.

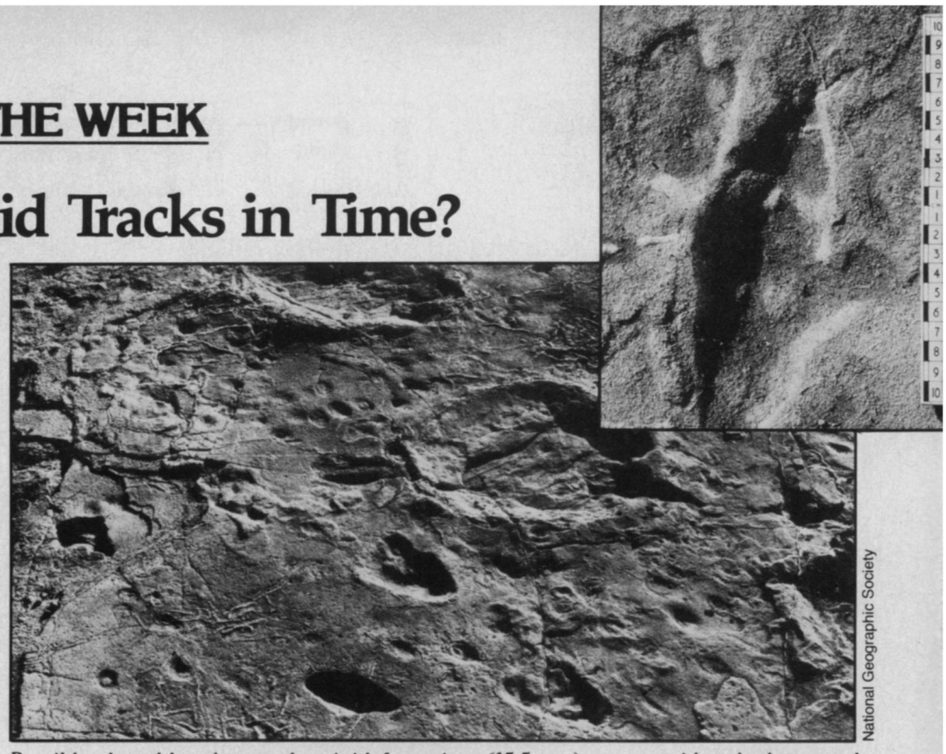
The fossilized tracks were preserved in a bed of volcanic ash 15 centimeters thick, formed by a series of eruptions from a nearby volcano. They are almost five meters below a coarse volcanic ash that has been dated at 3.59 million years.

The most interesting and possibly the most important find is a trail of five short, broad tracks that appear to be hominid. Several experts have seen the tracks and the consensus, says Leakey, is that they are hominid. She herself is 75 percent certain, but is reserving final judgment until more extensive testing can be done in a laboratory. Three of the tracks are still partially covered and will have to be cleaned and examined. Leakey's previously reported find of 3.35- to 3.75-million-year-old hominid teeth and jaw bones at Laetolil (SN: 11/8/75, p. 292) makes it easier to believe that these footprints are indeed hominid.

If the tracks do prove to be hominid, they provide information on the height and gait of our supposed ancestors. The creature in question appears to have been bipedal with a short stride (31 cm from heel to heel) and a rolling, slow-moving gait, as opposed to the free-striding gait of today's humans. Based on foot length (approximately 15 percent of the body height of a human), the creature who made the Laetolil prints was probably about four feet tall.

In addition to the possible hominid tracks, another trail is of particular interest. It consists of six oblong prints, each showing a digit or false thumb projecting to one side. These prints are closely associated with smaller circular prints and appear to have been made by a knuckle-walking primate. If so, they are important because no ancestors of today's knuckle-walking primates (the great apes) are known during the past five million years. The great apes are forest dwellers and their remains are not likely to have been preserved in such an environment.

Other animals who frequented and left tracks at what Leakey believes to have been a water hole include large elephants, black and white rhinoceros, many types of antelopes, three varieties of giraffes, a saber-toothed cat and many other extinct species. □



Possibly the oldest known hominid footprints (15.5 cm) seen amidst elephant and antelope tracks. Prints of primitive knuckle-walking primate (inset) were also present.

Diversion-resistant breeder reprocessing

Details of a diversion-resistant nuclear fuel processing technology were described this week by representatives of the United Kingdom Atomic Energy Authority and the Electric Power Research Institute of Palo Alto, Calif., at the Fifth Energy Technology Conference in Washington. Their "civex" process, designed for fast breeder reactor fuel, avoids production of pure plutonium — which could be used to make bombs — anywhere in the fuel cycle. It further thwarts potential thieves by "contaminating" fuel with radioactive fission products, thereby making the fuel "too hot to handle."

EPRI president Chauncey Starr and UKAEA deputy chairman Walter Marshall defined a proliferation-proof fuel cycle as one which guaranteed that production of weapons from its components was as difficult and time-consuming as making weapons from the spent fuel of light-water reactors (LWR's), the type predominant in the United States. "We think we have that [in civex]," Starr said.

Civex uses no new separations principles nor new methods of producing fuel, said EPRI's Floyd Culler, but draws from used and "partially developed" techniques — some with up to five years operating experience.

A press release issued by New Directions, a citizens lobby on international issues, criticized it, saying "Civex fails to meet its objective of being as proliferation resistant as the LWR fuel cycle because it would place in many countries a plutonium extraction facility," that could be "quickly engineered" for producing weapons-grade material. It said, "Any real reprocessing plant must be designed for changes in operation ... maintenance and decoupling of units that malfunction. These concessions [will result in a plant that can make bomb-grade material]. Also, any country with a civex reprocessing facility will have a trained cadre available to build a standard reprocessing plant."

That is not strictly true, says Milton Levenson, EPRI's director of nuclear-power programs. Based on personal experience, he says it would be easier, more practical and no more time-consuming to build a plutonium-production plant from scratch than to alter a civex plant. The United States cannot prevent a nation from going nuclear — peacefully or militarily — if it wants to, he said, even with civex. Civex is only designed to prevent *sub*national groups and terrorists from misusing it for military aims, he said. It also permits the United States to export, to those nations committed to developing a fast breeder reactor, a safer reprocessing technology than the purex (plutonium reduction by solvent extraction) process they would undoubtedly use instead, he said. □