DIGS

THE CASE OF THE MISSING LINK:
Misfiled bones have led researchers to discover humanity's ancestor

By Delta Willis

Martin Pickford held two "turtle" bones up to the light, glimpsing a network of capillaries and veins. These were no turtle bones, Pickford realized; they resembled pieces of a primate skull. It was 1981 and Pickford, a researcher from the Institute of Paleontology in Paris, learned that the expedition responsible for unearthing the "turtle" bones had also yielded an intriguing—and incomplete—skull from a chimp-sized primate dubbed *Proconsul.*

His next mission: matching the bones with the skull. Pickford called upon Johns Hopkins paleontologist and primate expert Alan Walker, who hunted down the skull and, with great delicacy, nudged the fragments back in place. The fit was perfect. *Proconsul,* the scientists discovered, had been much brainier than originally thought. In fact, according to a decade of new research conducted by Pickford, Walker, and others, the 18-million-year-old primate is probably the earliest known missing link between the apes and man. "*Proconsul* makes a good model for a common ancestor," Walker says. "Its features are generalized enough to embody traits common to the apes and us."

In 1984, to establish *Proconsul* as a legitimate missing link, Pickford and Walker headed for Kenya, where the esteemed paleontologist Mary Leakey had found *Proconsul* on Lake Victoria's Rusinga Island decades before.

The expedition provided the researchers with enough fossils to study *Proconsul* for years to come. Piecing together the bones in a process that continues to this day, Pickford and Walker have been able to establish the life cycle of this prehistoric primate. "We have males and females, babies through adults," Walker says. Indeed, the tedious process of preservation and reconstruction has revealed details as delicate as the ear's bones and semicircular canals. The seventh and eighth cranial nerves have been reconstructed as well.

Other researchers interested in the life of our ancient ancestor have begun studies of their own. David Beynon of the University of Newcastle upon Tyne in the United Kingdom, for instance, has been trying to determine the life span of *Proconsul* by examining its teeth. Beynon's unusual technique, which involves "reading" teeth much as researchers read the rings on a tree, should tell the life spans of *Proconsul* males and females.

Another researcher, Chris Ruff of Johns Hopkins, is using the principles of engineering to calculate *Proconsul*'s body weight. According to Walker, Ruff's analysis of limb bones should reveal not only the types of stress *Proconsul* had to bear, but also the differences—if any—between males and females. In the future, Ruff may also be able to illuminate the lives of *Proconsul* individuals. Did a particular male suffer from a broken arm or a spinal disorder? Did a female die from a head injury, or perhaps in childbirth? Ruff's new techniques may be able to answer some of these questions.

But even when these details and more are known, scientists will still debate whether *Proconsul* was truly our ancestor. "There are few ways to demonstrate that something is a real ancestor," Walker says. "Of *Proconsul,* one can say, simply, that here is an example of a population from which our ancestors most likely arose." He thinks a bit and then amends his response. "Genetically, we all go back to the primordial slime, don't we?" he adds. "Details of that are difficult to trace."

Buried beneath the earth for millions of years, the link between humans and apes now emerges from the forest of time.