Homo habilis

DISCOVERY AND GEOGRAPHIC RANGE

Louis and Mary Leakey discovered the first fossil material in 1960 at their site in Olduvai Gorge, Tanzania. Louis had been recovering stone tools from the site for years, but the manufacturer of those tools had previously eluded him. He named the species *Homo habilis* or "handy-man." Fossils attributed to *H. habilis* have also been found at Hadar (and possibly Omo), Ethiopia; Koobi Fora, Kenya (see Figure 23.2); and the South African sites of Swartkrans and Sterkfontein.

PHYSICAL CHARACTERISTICS

H. habilis exhibited a high degree of sexual dimorphism, with males and females weighing 114 and 70 lb and standing 5′2″ and 4′1″, respectively. Their skull, face, and dentition were more gracile than the australopiths. Their teeth and dental arcades were very human-like. The skull base was flexed, as seen in *Au. africanus* and the more derived robust australopiths and, relative to past species, the skull was rounder and higher, reflecting architectural changes in the brain. Cranial capacity ranged from 500 to 800 cc with a mean of 631 cc. This gave them an EQ of 3.1–3.5. At this point in hominin evolutionary history, we see increased asymmetry in the two hemispheres of the brain, termed lateralization or left hemispheric dominance. The left side of our brain is involved with language and analytical processes. Like all Old World monkeys and apes, *H. habilis* possessed Broca's area, which is involved with language production. However, it was larger than in past hominin species, and they also possessed Wernicke's area, which plays a role in language comprehension. They thus had the neural capacity for language. The left hemisphere is also related to right-handedness. They may have exhibited our tendency to hold objects with our left hand while working on them with our right. The frontal lobe, important in association processes, was expanded and resulted in more of a vertical forehead. The enlarged brain may have been facilitated by a decrease in gut volume, combined with a higher-quality diet that resulted from increased cognitive capabilities and an expanded technology base.

*H. habili*s had a smaller supraorbital torus and its face was more orthognathic than its supposed ancestor, *Au. africanus*, but they retained some prognathism in the lower face. They had fairly large ape-like incisors, but their canines, premolars, and molars were reduced in size. The mandible was more gracile, reflecting their reduced masticatory capabilities.

Like the majority of the australopiths, *H. habilis* possessed elongated arms, possibly suggesting continued reliance on an arboreal environment. While the digits were still curved, they had increased gripping capabilities for tool manufacture and use, as evidenced by the pronounced attachment site for the *flexor pollicis longus* muscle, which acts to flex the thumb.

The femoral head was enlarged and the neck shortened. Those changes are thought to have been the result of increased strain generated by an expanded pelvis for birthing larger-brained infants. However, no fossilized pelvic fossils have been found. Their foot was more modern, in that the hallux was no longer divergent but rather aligned with the lateral four digits, and the toes were shorter. They had less mobility in their feet, in that the foot had become more of a support structure like our own. The metatarsals were thick relative to modern feet, and the morphology of the third metatarsal suggests that they did not yet exhibit the degree of weight transfer and propulsive capabilities seen in modern humans.