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Humanity's forgotten family

Hominin fossils discovered near the site of the 'hobbit' Homo floresiensis *provide yet more evidence that the human lineage is more diverse than was ever imagined.*

Arthur C. Clarke wrote in *2001: A Space Odyssey* that behind every person now living stand 30 ghosts, for that is by how many the dead outnumber the living. That was in 1968 — the number reckoned today would probably be greater. The human lineage diverged from that of chimpanzees some 5 million to 7 million years ago. Were we able to mark the remains of all our ancestors from that point, the world would be one enormous cemetery.

The most likely fate of any living organism is dissociation into its component molecules, if not reabsorption as food into something else. That makes the chance ineffably remote that the remains of any one individual will be fossilized in any recognizable form, and, this having been achieved, be recognized as such by a passing palaeontologist before the fossil, too, crumbles to dust.

It is possible that many human species once existed, but became extinct with such finality that even those few that were fossilized have since disappeared, leaving absolutely no trace that generations of a distinct species lived and died on this planet — a kind of double extinction, without hope of memorial or discovery. Fossils from the human lineage are scarce, and, given the numbers that must once have lived, the percentage recovered must hardly be significantly different from zero. (You can read about some of those that have been found in our *Nature* collection at go.nature.com/1zjssjs.)

LONG-LOST RELATIONS

Hence the surprise when, in 2004, a group of scientists in Indonesia and Australia announced the discovery of what became known as *Homo floresiensis*, a species of unusual, dwarfed hominin — that is, a creature living or extinct more closely related to us than to chimps — whose remains were found in Liang Bua cave on the island of Flores in Indonesia (P. Brown *et al. Nature* **431,** 1055–1061; 2004).

There was some doubt at the time that *H. floresiensis* represented a real species rather than a variant of modern humans affected by some disease or pathological condition, but this dissent was gradually eroded, not only by a long palaeontological record at Liang Bua, but also by a rich archaeological record in the island's Soa Basin, some distance to the east, showing that hominins of some sort had lived in the region for up to one million years (A. Brumm *et al. Nature* **464,** 748–752; 2010.) Yet direct evidence, in the form of bones and teeth, was elusive. Until now.

On page 245, researchers report a fragment of mandible and six isolated teeth of hominins from Mata Menge in the Soa Basin that they describe as similar to those of *H. floresiensis*, but more primitive in some respects and — if anything — even smaller. In an accompanying paper on page 249, they show that the remains were deposited 700,000 years ago, many thousands of years before those from Liang Bua.

The researchers take the appropriately cautious and parsimonious view that these hominins were most closely related to early Asian *Homo erectus*, on the grounds that this is the only species of hominin otherwise known to have inhabited that part of the world at that time (see page 164). However, it remains possible, as an accompanying News & Views on page 188 explains, that these creatures might represent some very early, pre-*H. erectus* exodus from Africa. If so, that expands our ignorance from a barely manageable ocean into a gulf of interstellar magnitude, implying that a wholly unknown plethora of hominins lived in Eurasia millions of years earlier than anyone suspected, just one of whose number has been found in the region's southeastern extremity to betray the possibility that such an array of species ever existed.

> ***"Researchers are less eager than they once were to string fossils together into confident chains of ancestry and descent."***

Is this unwarranted speculation? Perhaps not: the discovery of *H. floresiensis* prompted a sea change in palaeoanthropologists' attitudes to the unknown. Researchers are less eager than they once were to string fossils together into confident chains of ancestry and descent. They are more likely to reappraise the various oddities of human evolution, no longer dismissing them as fossils that are hard to fit into the current paradigm of ancestry and descent, but seeing them as representatives of entirely unsuspected branches of the human family tree. One thinks of the many hominin remains recovered over the past few decades from China, some of which do not quite fit into any current species. Or of *Homo heidelbergensis*, an increasingly unwieldy catch-all for hominins from the Middle Pleistocene epoch (781,000–126,000 years ago); or of *H. erectus* itself, a grouping of such variety that some have found it hard to accept that all the fossils ascribed to it comprise a single species. And there are others less familiar, such as skulls from Iwo Eleru in Nigeria that look surprisingly archaic, despite being assigned a relatively recent date of as few as 11,700 years ago (K. Harvati *et al. PLoS ONE* **6,** e24024; 2011).

Studies on human DNA, ancient and modern, have reinforced this trend. The recovery of an entire genome of a hitherto unknown archaic hominin from a single finger bone from Denisova Cave in Siberia was — and is — an astonishing achievement, both for the discovery itself and for its implications (D. Reich *et al. Nature* **468,** 1053–1060; 2010). It reinforces hints that the scarcity of human fossils belies what might once have been hitherto unimaginable diversity. The finding, reported in the same paper, that Denisovan DNA lives on in people from southeast Asia and the western Pacific, just as Neanderthal DNA survives in Eurasians generally, proves that fossils tell us much less than we would like of the human career. And as with Iwo Eleru, so with DNA: there are signs that the genomes of some modern Africans contain elements derived from archaic hominins not found in the fossil record (M. F. Hammer *et al. Proc. Natl Acad. Sci. USA* **108,** 15123–15128; 2011).

These early human relatives left signs of their passing as evanescent and enigmatic as the Cheshire Cat from *Alice's Adventures in Wonderland* — slowly fading from view, with just its smile hanging on, until that, too, disappears. ■