

## Thirty-Five Years of Paleoanthropology

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When we published our first joint paper on human evolution back in early 1975 (Eldredge and Tattersall 1975), the world of human evolution was a very different place. For a start, it was populated by a much smaller cast of characters. Not only was paleoanthropology itself a much tinier enterprise than it is today, but the sum total of hominid fossils known was hugely smaller. The riches of the Turkana Basin in northern Kenya had only just begun to be explored. The iconic fossil “Lucy” had yet to be found in Ethiopia, and indeed, the Hadar area from which she came had only just been recognized for the palaeoanthropological treasure trove it has turned out to be. Now near-mythic names such as Atapuerca in Spain and Dmanisi in Georgia were yet to become part of the paleoanthropological vocabulary. And such lesser but nonetheless significant names as Ceprano, Drimolen, and Buia had still to fall even on professional ears.

Yet even more foreign to modern eyes than the small fossil pond—today we can no longer complain about an “inadequate” human fossil record, much as we’d like to have more—was the prevailing way of looking at the human evolutionary story. Back in the 1970s, the view of the hominid fossil record was fairly unrelentingly minimalist. Under the sway of the Evolutionary Synthesis as it was

imported into paleoanthropology in the early 1950s, students of human evolution generally sought to minimize the diversity they perceived in the known record. A single lineage struggling like a green tendril toward the light was the preferable view, and even though by the late 1960s discoveries in Kenya had rendered the strictest version of this model untenable (the “robust” australopiths had to be recognized as a side branch), there was still a general desire to simplify the picture as much as possible.

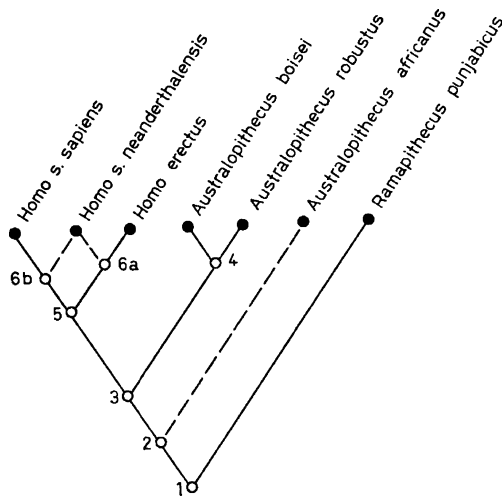
This was, of course, an example of what might be called “human exceptionalism”: Since there is undeniably only one species of human on the planet today, there is an understandable desire to reconstruct our phylogeny by projecting *Homo sapiens* back into the past through a chain of increasingly primitive extinct species. And although among primates (and mammals) in general there is an unmistakable signal in the fossil record as well as in the modern fauna of diversity—successful forms tend to become more diverse, not to strive toward a particular goal—hominids were regarded as an exception because they possessed culture, an elusive expression of behavioral complexity that “broadened” their ecological niche to the extent that no more than one species of our kind could exist at any one time.

When we began our joint investigations of human evolution in the early 1970s, the “cladistic revolution” was in full swing at least in certain corners of the American Museum of Natural History, where we both worked. And we were both highly sensitive to zoological diversity, one of us as a student of trilobites, a highly varied group of Paleozoic invertebrates, and the other as an aficionado of the lemurs, an insular group of primates in Madagascar that has diversified to an astonishing degree. We were hardly surprised, then, to find that the hominid fossils we looked at did not conform to any of the more or less linear views of human evolution that then prevailed. In particular, the cladogram we came up with (to

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**Fig. 1** The cladogram of hominid phylogenetic relationships as analyzed and depicted by Eldredge and Tattersall (1975, figure). Compare with the diagram in Harcourt-Smith (this issue)

our knowledge, the first ever published for hominids—see Fig. 1) portrayed *Homo erectus*, the (still) iconic “hominid in the middle,” as a form that was derived in ways that made it an eastern Asian offshoot from the “main stem” of hominid evolution. This conclusion has been bolstered by subsequent findings, although it is still resisted by many who prefer to squeeze a huge array of hominid morphologies from Africa and Asia into this one species—more as an issue of book-keeping, it seems, than of biology.

So be it, but as the papers gathered in this Special Issue clearly show, there really is diversity in the now impressively large human fossil record; compare the seven taxa of our 1975 hominid cladogram in Fig. 1, with the much greater diversity depicted by Harcourt-Smith (this issue).

The hominid family is not an exception in Nature, but rather it shows the signal common to all successful mammal families. Its evolutionary history has been one of experimentation rather than of inexorable improvement. There are clearly many ways to be a hominid, and our family has evidently tried most of them, if not all. Our own vaunted species is not the issue of a long process of steady improvement, but rather it is one individual branch on a luxurious bush that happens to have developed rather remarkable qualities very recently in time (as recently as 40 thousand years ago, there were at least four hominid species on Earth, and our present lonely splendor suggests there is something very special and unprecedented about ourselves).

Systematics must be the backbone of any attempt to understand any group of taxa, but it is far from the entire picture. The luxuriant fullness of the evolutionary story must be fleshed out with all of the other information it is possible to extract about the cast of characters, as vibrant living beings competing through time in dynamically changing environments. Today there are ways of uncovering such information that were undreamed of in the 1970s, and they are put to full use by the contributors to this Special Issue, which we hope will introduce the reader to the full richness of modern paleoanthropology.

## Reference

- Eldredge N, Tattersall I. Evolutionary models, phylogenetic reconstruction, and another look at hominid phylogeny. In: Szalay FS, editor. Contributions to primatology, vol. 5. Basel: S. Karger; 1975. p. 218–42.