ancestral hominoid form[4]. This divergence in evidence between teeth and postcrania became greater when additional dryopithecine postcrania from Rudabanya in Hungary were analysed, for these also were shown to have greater similarities with living great apes than other fossil apes[5].

The postcranial skeleton found by Moyà-Solà and Köhler[2] is some 9.5 million years old, and comes from an extension of a well-known dryopithecine site in the Valles Penedes region of Spain. A partial skull was described from this site by the same authors[6,7], who agreed with the present consensus view that it should be assigned to the species *D. laietanus*. There is some controversy, however, over the phyletic affinities of this material[7–9], with current proposals including a relationship with the African ape and human clade[10], with the orang-utan[6,7], or with neither[4,11], and this controversy is likely to be increased rather than diminished by the recent discoveries.

The interpretation of the postcranial characters as shared, derived characters of the *Dryopithecus* plus African ape and human clade[10] has little support from cranial characters. Support for its relationship with the orang-utan is also equivocal, whereas there is strong cranial evidence that the Eurasian genus *Sivapithecus* belongs to the orang-utan clade[12,13] while retaining most aspects of the ancestral postcranial conditions[14]. These two sources of evidence are incompatible for the two fossil hominoids, but there are several ways of interpreting them (see figure).

First, one would claim that if the evidence of the shared characters of the skull in *Sivapithecus* and the orang-utan is accepted, the postcranial characters shared by the orang-utan and the other apes should be interpreted as independently derived, convergent characters (homoplasies), for they are not present in *Sivapithecus*. Second, it is possible that these characters could have been present in the common ancestor of the great apes if the condition in *Sivapithecus* represents a unique reversal. Third, if the postcranial characters shared by the great apes and *Dryopithecus* are homologous, *Sivapithecus* could be excluded from any part of that clade and the cranial characters linking it to the orang-utan would have to be homoplasies. Finally, it is again possible that the postcranial characters are homologous and that the cranial features shared by *Sivapithecus* and the orang-utan are primitive.

There is no reason to expect all parts of the body to change at the same rate and at the same time, and this is clearly not the case in various hominoids from the Miocene (some 8–15 million years ago). The functional interpretation of the bones of the skeleton at least is clear: they show some adaptations to suspension that are similar to those seen today in the orang-utan. The implications of this are that *Dryopithecus* was a below-branch arboreal quadruped with a form of locomotion similar in many respects to that of the orang-utan (although the fossil ape was smaller). Most other fossil apes retained a form of locomotion[4,5] which is similar to that of present-day Old World monkeys and which is interpreted as ancestral for the hominoid primates. This change is manifested in the presence of several characters shared by *Dryopithecus* and the extant great apes and humans.

The question remains, however, as to which set of characters to use as the basis for phylogenetic interpretation, those from the face or those from the postcranium. Combining them in a total evidence cladistic analysis[15] does not solve the problem, for such an analysis would be heavily dependent on which morphological area can muster the greater number of characters. Functional significance might provide some indication of character independence, but it may be questioned if the functional complexity of the skull, though poorly known, renders it better or worse than the relative functional simplicity of the postcranial elements, be they ever so well known. Character complexity, phenotypic or genetic or both, is another criterion.

Additional fossil specimens always help, although they too can add to the problem, for such discoveries all too often lead to more questions than are answered and even greater uncertainty about evolutionary pathways. Arising out of the considerable incongruence between supposed shared-derived similarities revealed here, we believe that parallel work must concentrate on the way characters are initially chosen for phylogenetic analysis. □

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DAEDALUS

The light metallic

EVEN a perfectly transparent substance reflects some light from its surface. If, like diamond, it has a high refractive index, it reflects quite a lot. Now metals have extremely high refractive indices, so Daedalus suspects that they too are perfectly transparent. They just reflect away all the light that hits them, so that none can get in. By the same token, of course, none can get out either. Light inside a metal would be perfectly internally reflected, and could never emerge.

How to generate light inside a metal? Laser action is the obvious way. Some metals can absorb molecules that lase quite readily. Thus iron absorbs carbon monoxide, and palladium absorbs hydrogen and deuterium. Musing on this, Daedalus recalled 'cold fusion', claimed to occur when deuterium was electrolytically injected into palladium electrodes. He reckons the deuterium arrived in a highly excited state, and lased its energy away along unexpected metallic channels. The resulting heat was misinterpreted as fusion energy.

So DREADCO's physicists are devising ways of injecting suitably excited molecules into solid metals. They are trying electrolysis under vast voltages, ion bombardment and energetic surface decompositions. The metal laser is welded to a long wire, a sort of metallic optic fibre down which the laser beam will escape. Its far end, coated with caesium metal, is in a vacuum chamber. A photon hitting a caesium surface, of course, can eject an electron into a surrounding vacuum: this is the classic photoelectric effect. Daedalus reckons it will work just as well if the photon hits the caesium surface from inside.

Once intra-metallic radiation can be generated and detected, metal laser and light-wire technology will transform communications. The optic fibre companies will lose their monopoly of wide-band optical transmission: their telephone rivals will suddenly be able to relay optical signals over their networks of antique copper wire. They in turn will be upstaged by the electricity companies, who will fire wide-band optical data down their power lines, while the more historic gas and water companies join the game on their lead pipes. Endless television, video and computer data will shuttle in and out of every home along the mass of new fast data lanes. Sadly, they won't be all that fast. A light-wire, with its high refractive index, will inevitably act as a delay line. Quickfire repartee will arrive annoyingly late, and all parties to a video-conference will find themselves waiting impatiently for the others to see the point.

David Jones