

ical practice of piling on interpretations, each of which is contingent on some previous part of the argument and fails therefore to test the original premise, is particularly weak when the group in question has no living representative. Here, no indisputably chordate character is available to serve as a foundation for argument, while critics such as Philip and Ubahgs readily interpret the same structures as echinodermal. Perhaps in the end, to quote again:

A reader can only despair.... When equally eminent workers, starting from the same data, reach mutually contradictory conclusions, it might seem that all phylogenetic reconstruction is vain [p.350].

But all is far from vain, especially if the "calcichordate" argument is isolated from Jefferies's other contributions — his new

phylogenetic hypothesis for the living deuterostomes and his challenge to the story-telling that is inherent in the various schemes involving the tunicate tadpole. Jefferies has a masterly command of the anatomical literature, especially German and Russian, and the half of the book that reviews and analyses chordate structure and relationships contains many useful new insights. The general hypothesis can be tested against others based on biochemistry or development, but the "calcichordate" hypothesis cannot. Failing that, Cornuta and Mitrata seem to remain echinoderms and, like Wordsworth's "primrose by a river's brim", nothing more. □

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Outside opinion

Andrew Hill

The Red Ape: Orang-utans & Human Origins. By Jeffrey H. Schwartz. *Houghton Mifflin, New York/Elm Tree, London: 1987. Pp. 266. \$18.95, £12.95.*

OUR closest relatives among living animals are generally taken to be the African apes, that is, the gorilla and the chimpanzee. Charles Darwin held this view, though not so firmly as is popularly believed, and since then most people have concurred with him. The German zoologist Ernst Haeckel, Darwin's follower in both time and spirit, believed otherwise and suggested that the Asian orang — the red ape of this book's title — is the closest to us. Jeffrey Schwartz has resurrected this viewpoint and during the past few years has been heckling the palaeo-anthropological establishment from the sidelines.

Schwartz's initial forays were published in professional journals, and as well as meeting with surprise, not to say astonishment, also caused the realization that perhaps some of the assumptions on which received notions were based might benefit from closer scrutiny. In this sense his position has proved valuable. If anything, however, re-examination has only served to confirm the orthodoxy in the minds of those concerned.

The problem for Schwartz is that there are so many independent lines of evidence, among them palaeoanthropology, comparative anatomy, molecular systematics and cytogenetics, which support the conventional opinion. Work in each of these fields and others all points to the same conclusion — a strong phylogenetic proximity between African apes and humans. A few excuses for thinking other-

wise can be found in each area — and Schwartz finds them — but to invoke contrary circumstances to explain them all is a little too much.

So, if the evidence really does give the same indications, where is the scope for argument? Well, animals can be similar for different reasons. It has long been known that they can be similar because they are parallel or convergent in evolution, relatively unrelated species showing analogous adaptations to similar circumstances and needs. One of the main contributions of cladistic analysis has been to

derived features? There are methods for assessing the polarity of characters, for allocating similarity to primitive plesiomorphies or to derived apomorphies, but despite the assertions of some committed cladists it often remains difficult to be certain. This disturbing fact is employed centrally in *The Red Ape*.

Schwartz implies that the current view has developed from a misinterpretation of the similarity data, a consensus accepted uncritically by most palaeoanthropologists mainly because of their unquestioning assimilation of tradition. Suggestions of such cultural relativism are popular at the moment, the awareness of it being itself one of the culturally relativistic factors we have to contend with in evaluating ideas. But other scientists may believe this stuff not because they are victims of the myopia of history and their social circumstance, but simply because on more objective grounds they think it to be correct. Whether or not Schwartz turns out to be right in the long run, I still think the present evidence contradicts his view.

The Red Ape is entertaining and plausibly argued. Certainly, there's little wrong in holding or promulgating eccentric ideas — most good ideas were eccentric once — and whether or not you believe Schwartz's basic premise his book contains much of interest. There is a great deal of historical information about orangs and about ideas of phylogeny that will be of value to professionals and will fascinate the general reader. The only danger of the book is that

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Family fracas — the orang-utan, Jeffrey Schwartz's contender for our closest living relative.

make explicit the point that even homologous similarity (similarity due to relationship) can be of two kinds. One is useful in reconstructing phylogeny the other is not. If animals are similar only because they share the primitive character state of some remote past ancestor, then this provides little evidence about their present relationship. On the other hand if they are similar because they share a more recently derived state, then that is good information about relatedness. This is what the argument is about. Which, of the various similarities among the apes and humans are primitive retentions, and which are

people who have the inclination or time to read only a single account of human evolution will choose this one, and will take its contents to be representative of a large body of professional thought — which they are not.

In Huxley, Darwin had his bulldog to promote and support his theory. As he himself more or less admits in the book, Schwartz has yet to find as much as a poodle. In the dogged pursuit of his idea, he is barking up the wrong family tree. □

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