
 Book Reviews

Joysey, K.A.; Friday, A.E. (eds.): Problems of Phylogenetic Reconstruction. London, New York, Sydney, Toronto: Academic Press 1982. 442 pp., many figs., many tabs. Hard bound £ 31.30.

In the last decade, cladism has been taken up by many systematists. Up to now it has not made much impact on the vast majority of biologists working other than in the field of taxonomy. This is changing now through publications found outside specialist journals, e.g. the debate on the relationships of the salmon, the lungfish and the cow in *Nature*. Almost all the pages in this book are devoted to the controversy between the cladists and the evolutionary systematists.

For classification the cladists prefer cladograms based on the most parsimonious arrangements of shared, derived characters. Evolutionary systematists construct trees based on a manifold of aspects: morphological divergence, ancestry and more complicated concepts such as phyletic gradualism, paraphyly, polyphyly etc.

The weakness of evolutionary classification is, according to the cladists, its vagueness and its lack of objectivity. As Simpson, one of the major evolutionists, stated, taxonomy has to be practiced with a certain flair. On the contrary, the cladistic methodology is very straightforward and obeys, according to its practitioners, the first law of their patron saint Karl Popper: cladograms are falsifiable. This clear methodology is indeed the main attraction of cladism. In addition, extreme cladists claim that evolutionary aspects, in particular fossils, have no impact whatsoever on classification.

From their side, evolutionary systematists argue that evolutionary theory should play a role in classification. They also draw attention to the difficulty in distinguishing derived and primitive characters – which is a prerequisite for constructing cladograms. Furthermore, the evolutionary systematists stress that cladism is unable to handle the problem of homology and convergence.

Representatives of all parties in the debate were present at a conference in 1980 from which this book is the result: the evolutionary systematists, the inbetweens, the Hennigian cladists and the extreme, “transformed” cladists. Because, as one of the contributors noted, the debate between the camps is at best rhetorical and at worst polemical, such a conference could have clarified many things. I think in this respect the book is, for the major part, a failure. There is almost no integration between the contributions, resulting in a high degree of overlap, a lack of real discussion and inconsistency in terminology. For example, the arguments of the opponents

of cladism are often only arguments against the extreme, transformed cladism. In the last chapter, however, an attempt is made to clarify these terminological issues.

Also, at first it seemed a negative point to me that the organizers of the symposium were drawing so largely on local talent. However, after reading it appeared that this did not affect the quality and that it also avoided a problem of congresses that the same people are always telling the same stories.

My main criticism concerns the nature of the contributors. Because the main points of the controversy are on methodology, a philosopher of science could provide a great deal of clarification. It is clear from this book that most of the participants of the debate were not equipped for this. For example, one of the contributors states that following Popper the extreme cladists maintain that the theory of evolution is an “unproven hypothesis” (p. 368). But according to Popper, all our knowledge is unproven; Popper does not distinguish between proven and unproven, but between falsifiable and unfalsifiable statements. Then, the author continues by stating that an unproven hypothesis means that “it is not a phenomenon which can be recognized through the senses; all the evidence is circumstantial . . .”. This again is not a Popperian but a primitive, sensualistic philosophy of knowledge. In addition, the slavish, uncritical adoration of Popper’s demand of falsifiability by most cladists is remarkable.

It has been pointed out by philosophers of science that Popper’s contributions to biology are at best useless and that his criterion of falsifiability shows only one aspect of science. One other aspect is that scientific theories bring together and integrate many different areas. Because cladists try to practice classification without reference to the evolutionary process, and thereby isolate classification, evolutionary systematics seems to be superior to me. Indeed, as one of the cladists in this book maintains, evolutionary trees are one step further from reality (i.e. directly observable characters) than cladograms. But the same holds for example for the general theory of relativity in physics and it was precisely for this reason that it was criticized at first.

Finally, I think that by drawing too much on the presence or absence of characters, cladism is getting too close to the pre-Darwinian, idealistic morphology.

Concluding, I think that this book offers many good things to the debate between cladists and evolutionary systematists. On the other hand, it also shows the weak parts of the debate.

G.J.M. de Klerk, Nijmegen