The poverty of cladism[1,2]

Leigh M. Van Valen
Department of Ecology and Evolution
University of Chicago
915 E. 57 St.
Chicago, Ill. 60637, USA

Another book giving a cladistic view of systematics from the ground up? It has more diagrams than usual, it is more formal and even more dogmatic than usual, it uses partly different terms, and many examples are from the Platyhelminthes. For the cognoscenti, it isn't the transformed or pattern version. A major failing is its exclusive attention to classification per se; it doesn't even mention the existence of the real problems in estimating phylogenies, let alone suggest how to deal with them.

And the whole approach of cladists to classification lives in a dream world of its own. It does have beauty of a sort, as a siren's song is said to have. By using, or claiming to use, only one criterion it makes a stark and clear outline of a landscape, repeatable from the same cladogram by anyone (at least if the cladogram conveniently lacks extinct taxa and doesn't have too many sequential branches for comfort.) Precision is a virtue, but it should hardly be our primary criterion. Synthetic classifications can be made precisely too, as Stuessy (1987) and others have shown. More importantly, though, we should recall Tukey's famous maxim (1962, pp. 13-14): "Far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise." A single-minded emphasis on precision was the hallmark of operationalism and the reason for its eventual decline; their supposed advantage in precision is the only reason I know to prefer cladistic classifications.

I have yet to see any use whatever for cladistic taxa, as distinct from the phylogenies which they unsuccessfully (in detail) try to mirror. The statements that we came from apes, or from bony fishes, carry with them much additional information for which they are a proxy. Cladists can't say things like this because they don't even recognize the possibility of ancestral groups. Conversely, it is biologically and geologically useful to consider the problem of dinosaur extinction. Cladists can't do this, because they don't even regard dinosaurs as extinct -- they actually call birds dinosaurs just because that's where they came from, and they don't even recognize dinosaurs as such. Because most cladists don't recognize ancestral species, they fallaciously put the divergence time between a species and its ancestor at the base of the ancestor. They either classify groups which happen now to be extinct, in a fundamentally different way from the survivors to date, as Ax does regretfully, or they multiply the number of ranks of taxa to quite unwieldy extremes. They deny the very existence of horizontal relationship, but as any geneticist knows sibs are as closely related to each other as offspring are to their parents. And stability for the benefit of users? Ax quotes

*   *   *   *

approvingly a maxim by Gaffney that nomenclatorial stability is a symptom of ignorance. The exclusive reliance by cladists on relative time of phyletic divergence also makes cladistic taxa exceedingly noncomparable in different groups; by maximizing one criterion (closeness to phylogeny) they necessarily, and explicitly, pay no attention at all to others. Therefore cladistic taxa are worthless in comparative and synthetic studies.

Four pages fell out of the review copy while I was reading it.

Literature cited

Stuessy, T.F. 1987. Explicit approaches for evolutionary classification. Systematic Botany, 12: 251-262.

Tukey, J.W. 1962. The future of data analysis. Annals of Mathematical Statistics, 33: 1-67.