Bookreview

JOSEPH FELSENSTEIN (ed.)

NUMERICAL TAXONOMY

NATO Advanced Science Institutes Series, Ecological Sciences No. 1,
Springer Verlag, Berlin, Heidelberg, New York and Tokyo 1983, 644 pp. Price 57.90 US $.

Since its establishment as a discipline, numerical taxonomy has been the subject of considerable debate. In the seventies, along with the widespread use of computers, a growing number of taxonomists worked with numerical techniques themselves and the evolution of more sophisticated methods was stimulated. The sharpness of the first discussions lost its edge, but new conceptual approaches emerged and stimulated new discussions.

The reviewed volume (Proceedings of the NATO Advanced Study Institute on Numerical Taxonomy, held at Bad Windsheim, F. R. G., July 4—16, 1982) provides an excellent up-to-date summary of most of the topics discussed by numerical taxonomist today. Though its scope is enormous, ranging from phylogenetic classification to shape analysis, and from amino-acid sequence data analysis to wine sensory data clustering, its unifying theme is biological classification; however, some excursions into other fields of numerical taxonomy application are included. It is by no means a comprehensive summary of possible appplications or a reference volume on published methods; it is rather an excellent review of ideas and discussions. Though discussions of individual papers are not included, the papers themselves present widely differing views and their arrangement displays conflicting opinions in a clear way.

The papers presented at the symposium are arranged into groups of related topics, often with an informal introductory paper(s); the main interests of the book are: phylogenetic vs. phenetic classification, phylogenetic tree construction, clustering techniques, morphometrics, approaches to the study of geographic variation, analysis of biochemical data, computers in systematics. Traditional papers in numerical taxonomy (devising new methods, application of some methods to groups or data not yet studied) form a minor part of the book; most papers are devoted to discussions of already existing techniques, comparing them, and, importantly, testing them. Comparison of methods plays a dominant role in the sections on classification by clustering techniques (contributions by GOWER, MILLIGAN, FERRARIS, HUBERT) and phylogenetic tree construction (MCMORRIS et al., FIALA etc.). Of special interest are papers devoted to testing the performance of various cladistic methods, either using simulated or real data with known phylogeny (FIALA: simulation model for numerical taxonomy methods; ROHLF et al.: taxonomic congruence — a reanalysis; PIAZZA — CAVALLI-SFORZA: treeness test and analysis of variable evolutionary rates, etc.). Further, there is a strong accent on putting already used techniques on a sound conceptual basis, e.g. maximum likelihood view of phenogram and cladogram estimation (FELSENSTEIN, DEGENS).

Moreover, there are papers involved in the phylogenetic vs. phenetic classification controversy (contributions by CRACRAFT, FUNK, SNEATH, SOKAL etc.), most of them written with clarity and insight; the result of this discussion is necessarily such as the reader wants it to be; I personally thing that phenetically inclined readers would be more right.

I find the section on morphometrics the least rewarding (but only in comparison with the others!). Though shape analysis in taxonomy greatly needs modernisation, papers included here deal with particular matters and their interrelations are weak. Sections on applications (though numerous appplications are used to illustrate conceptual and/or methodical papers) and on computers used in taxonomy close the book.

It is profound, but entertaining reading; organizers and sponsors of the symposium and the editor are to be congratulated. I recommend it to everybody interested in current numerical taxonomy.

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