INTRODUCTION

Since the 1950s, a reexamination of the principles and methods of systematic biology has resulted in much debate. This debate has centered on the theory and methodology of phylogenetic reconstruction and the role such reconstructions should play in the development of classifications. Depending on one's choice, this area of systematic biology is called cladistics or phylogenetic systematics. The first formal statements of these methods and approaches were made by Hennig (1950) and Wagner (1961). Over the last 20 years, discussions of these methods have been along four main lines: the construction of branching diagrams or cladograms as expressions of the evolutionary divergence of organisms; the use of such reconstructions in classification; the development of hypotheses in systematic biology that can be tested and falsified; and the use of estimates of evolutionary relationship as a means for explaining current distributions (historical biogeography).

Other aspects of the phylogenetic history of organisms have also come under scrutiny as part of this debate. The time element, or chronistics, has received the least attention, because of the relative lack of fossil evidence and adequate data on the times of origin of groups. The most significant strides in this area have been made with macromolecular data. The patristic relationship, which is the amount of change that has occurred between any two organisms on a cladogram, is a logical consequence of their positioning according to the various methods of cladogram construction. The significance of this aspect for the development of classifications from cladograms has been debated strongly. The phenetic relationship, which is similarity (and/or difference) shown by using all available characters without consideration of the evolutionary events that produced that similarity (Duncan and Baum 1981), has generated much discussion of its impact on tree reconstruction and attempts at classification.

In this book, a variety of views are presented on these major relationships in phylogenetic reconstruction, as well as comments on many related

issues. The controversial nature of cladistics is reflected by disagreements on definitions, concepts, and methods among the contributors to this volume. We leave the reader to evaluate each of the opinions expressed.

Literature Cited

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