kinds of brachiopods recognized by most paleontologists. It is at the subordinal and superfamily levels that many difficulties appear. Few paleontologists would now insist on a monothetic Beecher-type classification, but some will dispute the revisions made by Williams and Rowell. Despite the apparent finality of this work, major classifications will continue to be advanced on combinations of internal and external characteristics that are considered by various specialists to have phylogenetic and evolutionary significance.

A few examples among the articulates indicate the extent of the difficulties. It has long been recognized that brachiopod shell structures fall into three broad categories: endopunctate, pseudopunctate, and impunctate. The apparently random inclusion of punctate genera in the section on Spirifers is most confusing. Punctate forms, usually with a spondylium in the pedicle valve, are classed as Superfamily Suessiacea, while the punctate syringothyrid forms are included as a family in the Spiriferacea. The Spiriferinacea are predominantly punctate forms which, however, include both the impunctate *Odontospirifer, Spiriferinaella,* and *Spiriferinoides* and the clearly unrelated genus *Dimegelasma.* No argument based on phylogeny or evolutionary change can justify such a hodgepodge. Similar confusion exists among the extremely variable genera included in the superfamily Reticulariacea. Among the strophomenaceans a complete reorganization of families and subfamilies on the basis of internal characters of the brachial valve, coupled with consideration of shell structures, probably would have greater phylogenetic significance than the classification given in the *Treatise.*

Despite these weaknesses in classification and organization, which are largely matters of opinion among specialists, the editor, the authors, and their collaborators have assembled most of the significant biological information on this important animal phylum. These volumes will be a standard reference source for student, teacher, and specialist alike for many years to come.

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Biological Organization: The Case for Evolution

It is no longer a fashionable exercise to prove the "case for evolution." Those textbooks that marshal the evidence from comparative anatomy, embryology, and paleontology in a solid phalanx of Victorian assurance are rapidly becoming extinct. They are being replaced by others that accept the fact of evolution as common knowledge and concern themselves with ways and means.

Bruce Wallace, in **Chromosomes, Giant Molecules, and Evolution** (Norton, New York, 1966. 171 pp., $1.95), contends that we are deluding ourselves. He believes that the recent flurry of antievolutionary sentiment (see *Science,* 11 Feb., p. 632) is the opening gun of a new campaign, and he would like to see his book become the weapon to win the allegiance of intelligent uncommitted laymen, especially teachers in public schools, clergymen, and parents.

The strategy for the demonstration of evolution is familiar, although the illustrations from genetics and molecular biology are a refreshing change from ear bones and aortic arches. Essentially the method is to show (i) that the structures of biological materials (here these are giant chromosomes, amino-acid sequences in proteins, and base sequences in DNA) are complex and precise; (ii) that different species possess very similar structures; (iii) that differences of structure within and between species are of the same kind; and (iv) that it is almost inconceivable that such similar structures could have independent origins.

The case built up by Wallace is a clear, concise, and logically unassailable one. The facts are well presented in a novel format that consists of a short text followed by 39 figures, each with a detailed explanation. My principal reservation concerns the varying standard of depth. The terms mitosis and meiosis are deliberately avoided for the sake of simplicity, but the structural formulas for 20 amino acids appear very early in the argument. Some of the examples, such as the diagram of chromosome changes in *Datura,* are quite complex. They will certainly tax the perseverance of the nonbiologist.

Another audience, however, may well be reached by this book. Undergraduate and beginning graduate students in biology should find that it provides a useful introduction to some very exciting material. It forges connecting links between at least three levels in the hierarchy of biological organization—the biochemical, the cytological, and the populational. Let us hope, therefore, that its principal use will be in the classroom rather than as ammunition in an ideological war.

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Ecological Genetics

In an age when any but the narrowest specialist finds more books published in his field than he can possibly read, the appearance of still another volume of symposium proceedings is likely to engender a feeling of resignation in a prospective reviewer. However, **The Genetics of Colonizing Species: Proceedings of the First International Union of Biological Sciences Symposium on General Biology** (Academic Press, New York, 1965. 458 pp., $24), edited by H. G. Baker and G. L. Stebbins, proved a pleasant exception from run-of-the-mill symposia proceedings, and I read the volume from cover to cover with great interest and considerable profit.

A reading of this volume is well worth the effort for a biologist interested in evolutionary problems. As I see it, the book's particular merits are threefold: (i) Much of the material is new, and it is clearly presented by outstanding authorities in the field. Much credit should go to the editors and to Professor C. H. Waddington, who selected the speakers. (ii) The problems of colonizing species are viewed rather broadly—not only over a wide taxonomic spectrum but also from the viewpoints of the several relevant disciplines, genetics, ecology, cytology, and behavior. (iii) The import of the contributions goes considerably beyond the confines of the symposium title. Much fundamental evolutionary theory is discussed using colonizing species as examples. This aspect of the book makes it of considerable value to evolutionists in general.

The subject matter of the symposium was concerned with the genetical and ecological consequences of the accidental or deliberate introductions of animals or plants into parts of the world