ments in the 10 months since the International Conference on Family Planning was held. The Conference Proceedings are the closest approximation to the current status of the great transformation that is now in process, but they are already historic and will be antiquated soon except as base-line documents. The magnitude of man's numbers in future decades is now uncertain, not alone because of the declining death rates and the delicately balanced relations between economic and political developments and population growth but because—on the one hand—the birth rates in the world's high fertility areas can no longer be assumed as inviolate, tied to the traditional verities of ancient cultures and beliefs, and—on the other—the availability of means does not insure automatic solutions to problems of population growth.

IRENE B. TAEUBER
Office of Population Research, Princeton University

Cetology

Whales, Dolphins, and Porpoises (University of California Press, Berkeley, 1966. 805 pp., $15), edited by Kenneth S. Norris, contains 33 papers that were presented at the First International Symposium on Cetacean Research held in Washington, D.C., in August 1963. These papers, each of which relates to a different facet of cetology, reflect the increased interest in research on marine mammals in the last decade or two.

Cetaceans present a combination of many barriers to study that are not encountered in most other kinds of organisms. The size of some, their habitat, and their general availability, as well as the relative rarity of certain species, are just a few of these. Despite the numerous factors unfavorable to research, amazing advances have been made in our knowledge of whales, porpoises, and dolphins in recent years. This is especially true with respect to their physiology, means of communication, behavior, distribution, and migration. Some of this is accounted for by the economic value of the animals themselves. The blubber and flesh of the larger species are still sought and are of considerable commercial value. The fact that cetaceans have an advanced type of mammalian brain and can be rapidly trained to perform remarkable and amusing feats has led to their use as performers in captivity. This in itself has largely been responsible for much of our most recent information on cetacean underwater communication. Likewise, most information regarding the physiology, behavior, and learning ability of cetaceans has been the result of studies on captive individuals.

The symposium, whose participants have their papers included in this volume, was presided over by L. Harrison Matthews, the scientific director of the Zoological Society of London. The published results are very logically divided into seven parts: (i) Systematics, distribution, and natural history; (ii) Anatomy, physiology, and sea animal propulsion; (iii) Underwater observation and recording; (iv) Communication; (v) Echolocation and recognition; (vi) Practical problems; (vii) Behavior. Part 6 pertains to a round-table discussion on the capture and care of cetaceans, in which five persons, including the editor (formerly curator of Marineland of the Pacific), participated. The significance of this phase of the symposium is obvious because most studies, other than those that pertain to anatomy or taxonomy, are dependent upon healthy captive animals.

Nine countries were represented at the symposium, which was the first of its type. It was sponsored by the United States Office of Naval Research and conducted by the American Institute of Biological Sciences.

ROBERT T. ORR
California Academy of Sciences, San Francisco

Marine Biology

This third volume of **Advances in Marine Biology** (Academic Press, New York, 1965. 412 pp., $13.50), edited by Sir Frederick Russell, contains four papers: "Learning by marine invertebrates" by M. J. Wells; "Effects of heated effluents upon marine and estuarine organisms" by E. Naylor; "Aspects of the biology of the seaweeds of economic importance" by A. D. Boney; and "Marine toxins and venomous and poisonous marine animals" by Findlay E. Russell. Two articles are applied in orientation; Boney's treatment of seaweeds is probably of more general biological interest, while Naylor's discussion of heated effluents is the shortest and least satisfactory of the four. However, it must be noted that the study of effects of warm effluent water has hardly begun and that in a field where the interest of industry is at stake it is not always easy to accumulate objective information. The contribution on learning by invertebrates is a well organized, analytical article, while that on toxins and venoms is primarily a catalog. All of these articles are useful summaries, but each is intended for a different group of readers, and I wonder if the potential usefulness to interested individuals justifies publication in this expensive manner.

JOEL W. HEDGPETH
Marine Science Laboratory, Newport, Oregon 97365

Introductory Business Statistics

Statistical Methods (Panstwowe Wydawnictwo Ekonomiczne, Warsaw; Pergamon Press, New York, 1965. 666 pp., $17.50.), by Stefan Szulc, covers roughly the ground of an introductory text in economic or business statistics, with a few additional topics thrown in. The substantial size of the book is due neither to these extra topics nor to an advanced treatment of any of the subjects covered, but to an approach that develops every topic from the ground up, as it were. No previous knowledge or training on the part of the reader is assumed. Discussion, once started, is continued at length until the topic is brought to, but never beyond, an elementary level.

Among the conventional subjects covered by the author are frequency distributions, graphical representations, measures of location and dispersion, analysis of time series, index numbers, correlation, and sampling. Curvilinear correlation and life tables are given a little more attention than is usual. Statistical inference is virtually ignored, except for a few pages inserted in the section on sampling.

The level of presentation can be illustrated by the treatment of index numbers. This is restricted very nearly to simple aggregative (Laspeyres and Paasche), quantity-weighted price indexes and price-weighted quantity indexes. There is, of course, no suggestion of possible anomalies resulting from the use of administratively set prices as weights for quantities, nor that anything other than prices could be used as weights. A footnote that promises new developments ("Since this

book was written studies on indices have developed considerably. . . .") may mean that the Russians are about to announce the discovery of value added by manufacture. A section entitled "Examples of the application of composite indices in the Soviet Union and in People's Poland" is not very informative because there is no reference to anything that happened after 1952. A longer section, "Composite indices in the statistics of capitalist countries," makes the general point that such indexes may be completely unrealistic; if they are not it is usually a matter of coincidence, and even in the case of "correct indices published in capitalist countries a critical evaluation of their applicability from the point of view of Marxian theory is advisable." The only reference to Western literature in this section is to Irving Fisher's *The Making of Index Numbers* (1922).

Three appendixes discuss smoothing, interpolation, and rounding at the same level as the main text. These are followed by scanty statistical tables of normal curve areas, the *t* distribution, the chi-square distribution, and random numbers. An additional table of squares, square roots, and reciprocals seems a little archaic. A "name index" with 136 entries becomes less impressive when one notes that these are names, not citations, and that nearly half of the entries should be dated prior to 1900. The list includes Artaxerxes, Bonaparte N., Carl the Great, Cyrus, David (not F. N., but the one who had a census taken with somewhat disastrous results for Israel), Louis XIV, Moses, Peter I, William the Conqueror, and other eminent statistical practitioners. To be fair, the most frequently noted are K. Pearson and J. Neyman. Next in line is W. I. Lenin. Marx and R. A. Fisher are accorded one mention each.

The translation misses the idiomatic by a wide margin, but the meaning is usually clear, at least from the context. Surprisingly, for a work which lists a translator (J. Stadler) and two translation editors (H. Infeld and C. D. I. Forrester), the book is poorly or carelessly edited.

W. DUANE EVANS
Cornell University, Ithaca, New York

Introductory College Biology Textbook

Plant Diversification (Holt, Rinehart, and Winston, New York, 1966. 157 pp. Paper, $2.25), by Theodore Delevoryas, is presented as one volume in a series of ten designed for coordinated use in teaching introductory college biology. Delevoryas states that he wishes to present "certain topics of special evolutionary interest and to develop them more fully than is possible in a survey of all the plants." Like all methods, this approach has its advantages and drawbacks. Evolutionary principles, in my opinion, tend to emerge most clearly following a detailed survey of at least certain groups. Delevoryas, as might be expected, presents his own interest, paleobotany, in generous measure. Few other authors would have stressed fossil plants to such a great extent. This viewpoint is a quite legitimate one, however.

Selection of materials for an elementary text inevitably produces arbitrary inclusions and exclusions: for example, bryophytes receive scant mention and are not illustrated, while several types of life cycles in red algae are illustrated. The text is clearly written and accurate.

The illustrations of fossil plants are excellent. For living plants, drawings have evidently been designed so as to be simple and uncluttered; some tend to be two-dimensional and textbookish, however. One regrets that few illustrations are original; most were taken directly from other sources, or were redrawn. This results in some mediocre illustrations: why, for example, should the illustrations of a sunflower have been redrawn from those in an old botany textbook when fresh material of this plant is so readily available? The fruit of *Bidens* is inexplicably inverted. A dehiscing fruit of *Ecballium* appears to have a second pedicel, at the distal end of the fruit, which attaches to the stem. The shoot apex of *Syringa* is in poor focus. The photograph of a vessel is not likely to impart a clear impression of the nature of a vessel. We are offered drawings of a gametophyte and gametangia of a fern, but no sporangia, spores, embryos, or sporophytes. Drawings of the life history of a pine do not include embryos. I find the drawings of angiosperm steles and nodes misleading. A uniformly excellent level of illustration is very difficult to achieve, and one can sympathize with the problems involved.

Despite the merits of Delevoryas's contribution to this series of complementary texts, one may question the success of the experiment as a whole. The goal of truly coordinated volumes within a series is nearly impossible; even if it were achieved, cross-reference would be awkward. For example, although there is a volume on ecology within the series, ecology is stressed elsewhere: Delevoryas's discussion of angiosperms is built on ecological adaptation. The ten volumes of the series might offer flexibility for teaching elementary biology, but this poses problems: if one does not use all ten, how are lacunae to be avoided? Use of a series rather than a single volume is undeniably cumbersome. This scheme will appeal most to those who enjoy its novelty, or who actively desire liberation from a single text. We can thank the publishers for giving us the opportunity to judge this alternative. The problems involved in this arrangement, however, offer so many difficulties that the majority of professors may decide that a single, large, hardcover text is not a Procrustean device but just the unifying touch needed in a biology course. If one chooses a single textbook, one has a wide choice among attractive and appealing botany, zoology, and biology texts. With the series scheme, however, one has little choice but Holt, Rinehart & Winston's authors and their viewpoints. One notes that other publishers currently show little desire to emulate the idea.

SHERWIN CARLQUIST
Rancho Santa Ana Botanic Garden, Claremont, California

Classification of the Teredinidae

Perhaps in its more radical departures from the dreary wastelands of the dry-shell approach this book, **A Survey and Illustrated Catalogue of the Teredinidae (Mollusca: Bivalvia)** (Museum of Comparative Zoology, Harvard University, Cambridge, Mass., 1966. 275 pp.), which is concerned with the systematics of shipworms, indicates a new trend in molluscan taxonomic practice. In the hope of find-