Ocean and a tabular listing of the Antarctic and sub-Antarctic pelagic copepods. Rogick's paper on Antarctic Bryozoa is a timely extension, up to 1962, of the distribution of Antarctic bryozoans beyond Cushing's very complete review (1943) on the "Discovery" collections. Rogick includes a table of bryozoologists and the sources of their collections; she has, in addition, carefully assembled bathymetrical and areal distribution tables. Her 12 pages of text are documented by a bibliography of 30 references. Rogick laments the dearth of ecologic information on Antarctic species and recommends the examination of existing collections of Antarctic mollusks, crabs, echinoderms, and the like, for additional new species, or for information on new distribution records. Mary D. Rogick died 24 October 1964; she was known as a most careful worker, an outstanding contributor to the study of the Bryozoa, and an artist in her own right.

Chapters 13 through 19 are on the terrestrial invertebrate fauna of Antarctica. In the first, Dalenius, an authority on the Acarina, provides a comparatively long and informative account on the systematics and distribution of the free-living and parasitic mites, including the marine species. In another entomological treatise Gressitt includes all the land arthropods and Insecta and many valuable and interesting field notes. The emphasis is largely ecological, with a wealth of geographical details and good notes on distribution. Gressitt also prepared a number of maps that show ranges of genera and species in the sub-Antarctic islands, and a table to the southernmost representation of insects by families.

Andriashev, in a comprehensive and authoritative review of the composition and distribution of the Antarctic fish fauna, deals principally with bathypelagic fish ("Little is known of the abyssal fishes of the Antarctic") and with the biological peculiarities and cold adaptation of various members of the Antarctic fauna. There is a short section on white-bloodedness of chaenichthyid fishes. Andriashev states that Soviet research on Antarctic fishes began in 1956, when the first extensive collections were made by biologists on the *Slava*, a Soviet whaling factory ship. He adds that, since that time, the principal collections have been made by the *Ob* in her annual cruises to Antarctica. The collections are quite large, and it appears that the Soviet ichthyologists have reported on their materials in a remarkably prompt manner. Such interest in the fish fauna of the Antarctic regions is in perfect agreement with the persistent aim of Soviet oceanography to seek out knowledge, both commercial and scientific, of the marine resources of all oceans.

Chapters 16 and 17 are devoted to the birds of the Antarctic. The first of these, by Prévost and Sapin-Jaloustre, is in French, and it represents the longest and most copiously illustrated paper (97 pages) in the volume. The illustrations consist of 36 photographs and numerous figures that give climatic, physiologic, and related data. The chapter deals almost exclusively with the true Antarctic penguins, the Adélie and emperor. "Antarctic birds," a chapter by Voous, is ". . . devoted to land birds," but these again are predominantly oceanic species. It is a systematic account of the various species, with notes on their migration, nesting sites, geographical distribution, breeding seasons, and feeding habits, and other background information, collated largely from the literature.

In the last chapter Ove Wilson discusses human ecology. Wilson is well qualified to write on the subject, because he was the medical officer on the Norwegian-British-Swedish Antarctic Expedition of 1949–1952, which served as a pre-IGY example for international cooperation. He gives us a careful and thorough review of just about all phases of the medical, psychiatric, and sociological factors that affect man in the Antarctic. These subject areas have been ingeniously brought out in the bibliography by arranging a total of 224 references under nine subheadings. The most astonishing facts brought out are that, despite certain anecdotal and empirical observations, there is no convincing demonstration that a definite physiological process of acclimatization takes place in a man who resides in Antarctica, and that the processes of reacclimatizing winter personnel after they have returned from the "White Continent" have not been investigated.

Biogeography and Ecology in Antarctica had its inception more than 3 years ago. Difficulties are apparent, most of which seem to stem from lack of strong or clear editorial control. For example, there does not appear to have been a proper exchange of outlines or of authors' lists among the collaborators; this may explain the regrettably patchy nature of the volume. Duplications and omissions could perhaps have been avoided, if those who work in closely related disciplines had been given an opportunity to review their colleagues' reports. There are a number of typographical errors and an uncertain use of English equivalents to which the reader can easily adjust—for example, the use of the French term *plancton*. The index lacks detail; separate indices to authors and scientific names would have been very useful. The endpapers might have been utilized to carry maps of Antarctica and a list of geograpical regions.

Despite these incidents attending its birth, the excellence of a few, and the reference qualities of the majority of the contributed papers will rate this volume high in the estimation of all serious students of Antarctic biology.

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Plant Tissue Culture

Proceedings of an International Conference on Plant Tissue Culture (McCutchan, Berkeley, Calif., 1965. 579 pp., $12.50) is a record of the conference which was sponsored jointly by NATO and Pennsylvania State University and held from 28 May to 1 June 1963 at the Nittany Lion Inn, University Park, Pennsylvania. The *Proceedings* were edited by P. R. White and A. R. Grove and published (by offset printing) jointly by the American Institute of Biological Sciences and McCutchan.

The conference, which was modeled after the "Decennial Review Conference on Tissue Culture" (Woodstock, Vermont, 1956), was called to give attention to the many aspects of the field as well as to gather the many research workers scattered throughout the world who are utilizing tissue cultures as a research tool. Although the table of contents does not clearly show it, the 44 contributions were presented at eight sessions, and each session was followed by discussion. Efforts to make the conference international are apparent from the list of contributors. The articles ran from comprehensive ones with extensive bibliography to brief reports of activity within an investigator's laboratory. The following general areas are covered: cell, tissue, and organ nutrition; metabolism; histogenesis; morphogenesis; single-cell culture; genetics; cytology; and

pathology as applied to plant tissue culture. There is a generous mixture of contributions from those primarily interested in the technique or refinements of media to those who are utilizing the technique as a tool for investigation of biological problems. The articles *in toto* indicate that tissue culture is rapidly emerging from its preliminary, general survey stage.

It is unfortunate that there has been such a long time lapse between the conference and the publication of the proceedings. The method of printing was apparently selected to expedite publication. The book is attractively bound, with a hard cover, but the first 26 pages of my review copy were poorly collated, with the result that several pages were off-center; several lines of legend were also omitted, and some labels within figures were not translated into English, as they should have been to provide uniformity. A subject index would have been helpful.

The book accomplishes its intent to provide the scientific community with knowledge and understanding of some of the new developments in nutrition, metabolism, physiology, histogenesis, morphogenesis, genetics, cytology, and pathology as applied to tissue culture. It also makes accessible an accurate account of the conference to those who were not fortunate enough to be present.

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Biophysical Research

Although the title does not indicate it, this book, **Ultrasonic Energy: Biological Investigations and Medical Applications** (University of Illinois Press, Urbana, 1965. 396 pp., $12.50), edited by Elizabeth Kelly, comprises the proceedings of a symposium sponsored by the Biophysical Research Group of the University of Illinois (Urbana) in June 1962. Owing to the prestige and the important pioneering work of the host laboratories—as reflected in the fact that they contributed 7 of the 25 papers (about one-third of the book)—these symposia are held in high esteem and attract most of the active workers in the field. This alone would be sufficient reason to recommend the book to all who have more than a passing interest in the field. That there are not many similar books only serves to emphasize this point.

Papers from 17 laboratories, in 7 countries across the world, together with the discussions, are presented. The topics cover many aspects of the current application of ultrasound in experimental, therapeutic, and diagnostic fields, with the exception of ultrasonic diathermy techniques used in physical medicine. All the papers are well written, in English, and with remarkably few apparent errors—no mean achievement considering the fact that ten of the papers originate from four non-English-speaking countries. The majority of the papers are of high standard and present work that was reasonably recent in 1962. Why it takes more than 2½ years to publish verbatim reports of a symposium, when authors are generally rushed into correcting and returning transcriptions within 24 hours, is a baffling question. But this delay, in addition to impeding dissemination of information, probably lowers the quality of papers presented at symposia, because authors are likely to seek prompt publication of their new and good work in reputable journals.

The proceedings are presented *in toto*; thus the book is illustrated profusely, almost to superfluity. For example, although Figs. 3 to 7 in chapter 8 were probably useful during verbal presentation, they serve little or no purpose in print. The quality of the illustrations is generally high with a few exceptions—for example, Figs. 5 and 6 in chapter 14. The electron micrographs in chapter 8 leave much to be desired, even when judged by the standards of 1962.

The chairmen of various sessions make tantalizing references to the "unusual interest of previous symposia," but these are neither listed nor numbered. Because the proceedings were apparently published under different titles, and by different publishers, it is not easy to satisfy the curiosity aroused. Inclusion of a cumulative index of subjects and authors, and the affiliations of active participants, in the space that could be made available by judicious omissions of illustrations, such as photographs of equipment to which the only reference is something like "Fig. *X* shows the generator" (for example, Fig. 1 in chapter 12; and Fig. 1 in chapter 23, since it reappears as part of Fig. 3), would enhance the usefulness of the book.

Notwithstanding these minor and hopefully constructive criticisms, congratulations are due all those concerned with the production of the book and particularly the editor, who also organized the symposium. The book should be accessible to all interested in the field and is recommended not as a textbook or as an applications guide but as a statement of the state of art—the state of art in 1962.

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New Books

Mathematics, Physical Sciences, and Engineering

Advances in Computers. vol. 6. Franz L. Alt and Morris Rubinoff, Eds. Academic Press, New York, 1965. xvi + 310 pp. Illus. $13. Six papers: "Information retrieval" by Claude E. Walston; "Speculations concerning the first ultraintelligent machine" by Irving John Good; "Digital training devices" by Charels R. Wickman; "Number systems and arithmetic" by Harvey L. Garner; "Considerations on man versus machines for space probing" by P. L. Bargellini; and "Data collection and reduction for nuclear particle trace detectors" by Herbert Gelernter.

Advances in Control Systems: Theory and Applications. vol. 2. C. T. Leondes, Ed. Academic Press, New York, 1965. 323 pp. Illus. $13. Five papers: "The generation of Liapunov functions" by D. G. Schultz; "The application of dynamic programming to satellite intercept and rendezvous problems" by F. T. Smith; "Synthesis of adaptive control systems by function space methods" by H. C. Hsieh; "Singular solutions in problems of optimal control" by C. D. Johnson; and "Several applications of the direct method of Liapunov" by Richard Allison Nesbit.

Atmospheric Oxidation and Antioxidants. Gerald Scott. Elsevier, New York, 1965. 540 pp. Illus. $26.

The Chemistry of Open-Chain Organic Nitrogen Compounds. vol. 1, *Functions Derived from Ammonia: Amines, Amides, Imines, Nitriles, Isocyanates, Etc.* Peter A. S. Smith. Benjamin, New York, 1965. 368 pp. Illus. $19.50.

Contributions to Statistics. C. R. Rao, Ed. Pergamon, New York; Statistical Publishing Co., Calcutta, India; 1965. 532 pp. Illus. $18. Thirty-two papers presented to Professor P. C. Mahalanobis on the occasion of his 70th birthday.

Disquisitiones Arithmeticae. Carl Friedrich Gauss. Translated from the second German edition (Gottingen, 1870) by Arthur A. Clarke. Yale Univ. Press, New Haven, Conn., 1966. 492 pp. Illus. Paper, $2.95; cloth, $12.50.

Electricity and Magnetism: An Introduction to the Theory of Electric and Magnetic Fields. Oleg D. Jefimenko. Appleton-Century-Crofts (Meredith), New York, 1966. 605 pp. Illus. $13.

Elements of Probability Theory. L. Z. Rumshiskii. Translated from the Russian

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