field. This critique will be carefully studied by many readers.

The author describes the procedure by which he has selected the 253 references he cites. Some other citations could aid the balance of contrary theories and hypotheses. Some subjects of widespread interest and importance —such as fluoridation in regard to caries susceptibility—receive very brief treatment, and some subjects of lesser immediate concern are covered in considerable detail.

The book is intended and is suitable for readers at the level of graduate students in the physical and biological sciences. It can be profitably studied by those engaged in apatite research. It will undoubtedly stimulate further development of the field.

DALE R. SIMPSON
Department of Geological Sciences,
Lehigh University,
Bethlehem, Pennsylvania

Fragile Ecosystems

Proceedings of the Colloquium on Conservation Problems in Antarctica. Blacksburg, Va., Sept. 1971. BRUCE C. PARKER, Ed. Virginia Polytechnic Institute and State University, Blacksburg, 1972 (available from the editor, Department of Biology, Virginia Polytechnic Institute). vii, 356 pp., illus. $10.

Described as "a continent for science," Antarctica has truly become so through researches and an international treaty now 14 years old. Recently some of the scientists, particularly those who study the unique biology of that austere land and its frigid seas, have become aware that man, a recent invader, can, and already has, set in motion the seeds of possible destruction of Antarctica's fragile ecosystems.

In 1971, a conference was called by those scientists to consider human impact and conservation problems in Antarctica, particularly near American bases. The proceedings of that conference provide insight into the problems and their possible solutions. Most of the 19 papers can be categorized into two groups: those that report scientific results indicating the uniqueness and instability of the ecosystems, and those that describe environmental damage and suggest methods of prevention. In the first group are papers about the benthos, the freshwater organisms, including fungi, and their environments; and the terrestrial ecosystems of East Antarctica. In the second are papers that consider trace elements in the atmosphere; contamination of snow by engine exhaust, heavy metals and chlorinated hydrocarbons in marine organisms and marine-feeding birds, radioactive contamination from global fallout and scientific experimentation, destruction of native subantarctic vegetation by man and introduced animals, and problems of human waste, trash disposal, and environmental contamination with exotic microorganisms. There are a few papers that do not easily fit into these categories and would likely be overlooked by those who saw only the title of the volume or its table of contents. For example, I. E. Wallen's paper "Why preserve the Antarctic?" is a general discussion of management in conservation that describes already-tried measures in various parts of the world not Antarctica, and Jay T. Shurley's paper considers psychoecological viewpoints, particularly in isolated human small groups.

The information in this volume will be of most interest to those who have worked, or will be working, on antarctic research. This is especially so because George Llano's paper gives references to relevant conservation recommendations and the appendices contain the texts of the Antarctic Treaty, the "agreed measures" for the conservation of antarctic fauna and flora from the various Antarctic Treaty Consultative Meetings, and recent agreed measures for the conservation of antarctic seals. There are also four work group summaries of recommendations for future conservation measures, both general and specific, including consideration of tourism and scientific projects, and valuable comments in the printed discussions of the papers. I believe that others interested in environmental problems will find this volume of interest because it considers an area of the globe where there has been very little human influence and where unique ecological conditions exist. It could give us some insight into problems of man's impact on space exploration environments, as Roy E. Cameron notes in his paper.

I feel obliged to comment on the editing and printing of this volume. It is unfortunate that there are so many typographical errors and printing mistakes, including a few dropped lines, slanting lines, and imperfect letters. This, together with some poor photographic reproductions, inclusion of many, sometimes interesting, "special figures" which do not relate to the text, and large conspicuous numbers on all figures, detracts from the readability of a volume which has much to tell those interested in the problems of man's ability of sustaining his environment, including the environment which provides material for his own research activities.

EMANUEL D. RUDOLPH
Institute of Polar Studies and
Department of Botany,
Ohio State University, Columbus

Gamete

The Genetics of the Spermatozoon. Proceedings of a symposium, Edinburgh, Scotland, Aug. 1971. R. A. BEATTY and S. GLUECKSOHN-WAELSCH, Eds. Published by the organizers of the symposium, Edinburgh, 1972. 406 pp., illus. For copies, apply to the Librarian, Department of Genetics, University of Edinburgh.

Spermiogenesis constitutes one of the most sophisticated seriations of differential events to be observed in multicellular organisms; its end result, the mature spermatozoon, is one of the most complex and highly specialized cells known. These facts alone would amply justify extensive and diverse efforts to study this facet of development. The function of the spermatozoon is, *sensu stricto*, the transmission of genetic material from the male parent to the zygote. The realization of this naturally evokes numerous practical aspirations ranging from the identification and selective elimination of genotypically abnormal sperm to the use of specifically appropriate sperm in animal breeding programs.

The first symposium on the genetics of the spermatozoon has brought together electron microscopists, immunologists, and developmental geneticists. The resulting breadth provides an excellent perspective for the primary concern of the symposium, gene expression in the various cells of the male germ line, and renders the proceedings valuable to functional anatomists, reproductive biologists, and developmental geneticists alike.

Although it contains a paper on *Chlamydomonas*, an occasional micrograph of a cat or a chinchilla spermatid, an occasional reference to a freemartin or a hinny, the volume is clearly dominated by studies of fruit flies, mice, and men. This is as it should be. Included are accounts of