is greater than the corresponding complementarity between *E. coli* genes and *B. subtilis* 16*S* RNA. The complementarity with the ribosome binding sites of *E. coli* mRNA's may be insufficient to promote proper binding of *B. subtilis* ribosomes and consequently may be involved in the template specificity of *B. subtilis* ribosomes.

Another subject well covered in the two books is the development of a molecular cloning system in *B. subtilis*. The books describe the problems encountered in trying to develop such a system and the steps that have been taken to overcome them and give examples of genes that have been cloned in *B. subtilis*. Also covered is the development of several cloning vectors for use in *B. subtilis* and the development of shuttle vectors that replicate in either *B. subtilis* or *E. coli*.

The books are worthwhile additions to the literature. Because the Dubnau book is more of a review of the entire field it might hold greater interest for workers from other fields. In covering fewer topics in greater detail, the Ganesan, Chang, and Hoch book might be more valuable to researchers who study bacilli. In my view the books are complementary and are valued additions to my reference library.

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Neurobiology

Molecular Genetic Neuroscience. Papers from a meeting, Woods Hole, Mass. FRANCIS O. SCHMITT, STEPHANIE J. BIRD, and FLOYD E. BLOOM, Eds. Raven, New York, 1982, xx, 492 pp., illus. $74.

The recent meeting of the American Society for Neuroscience began with a talk on the cloning of acetylcholine receptor genes and ended with a talk on the cloning of neuroactive peptide genes from *Aplysia*. Neurobiologists who think that the trend toward molecular biology will continue should find *Molecular Genetic Neuroscience* to be interesting reading.

The book contains reports from a conference held under the auspices of the Neurosciences Research Program. The objectives of the conference were to introduce the concepts and practice of molecular biology, particularly genetic engineering, to neurobiologists and to introduce molecular biologists to the nervous system. Related manuscripts are grouped in sections, beginning with studies of nonneuronal gene expression and progressing to the application of immunological and molecular genetic techniques to the nervous system. The editors provide an introduction to each section consistent with a theme developed by Francis Schmitt in the introductory essay, that changes in gene expression may be part of the behaviorally relevant plasticity of neurons.

Overall, the quality of the papers in the book is quite high. Those in the sections on organization of DNA, control of gene expression, and application of somatic cell genetics to developmental problems are excellent summaries of research by leading laboratories in these subjects. A paper by Leroy Hood on the genetic mechanisms that generate antibody diversity describes a system that may be a paradigm for similar, but hitherto undiscovered, systems operative in the brain. The new microchemical methods that Hood describes for sequencing nanomolar amounts of protein so that the information gained can be used to synthesize oligonucleotide probes for genes encoding proteins present in minute quantities are clearly going to be widely used in neuroscience and developmental biology. An excellent paper by Richard Lerner describes another procedure of general interest to neurobiologists: the chemical synthesis of peptides using sequence information provided by DNA and the use of these peptides to raise antibodies to the native protein containing this sequence of amino acids. The most exciting results of molecular biology on neuroactive molecules are described in several papers on the structure and processing of neuropeptide precursors, as determined in large part by gene sequencing. Papers by William Hahn and François Gros and their colleagues provide an introduction to methods used to calculate the number of active genes in the nervous system and reasons for believing that the diversity of gene expression is higher in the nervous system than in other tissues. An outstanding paper by David Housman and James Gusella describes molecular genetic approaches to hereditary neural degenerative disorders, such as Huntington's disease. Finally, some cogent strategies for the application of molecular biology methods to neurobiology are offered by Hans Thoenen and Floyd Bloom.

Neurobiologists will find it well worth their while to read a judicious selection of the papers in this book, even though advances during the last year have dated some of them. Reports to appear shortly on cloning of the genes coding for nerve growth factor and the voltage-sensitive sodium channel emphasize how dramatic the impact of molecular genetics on neuroscience is likely to be. New methods using expression vector systems to isolate genes are more powerful than the classical technologies described in the book.

For neurobiologists, the book is highly recommended. Its chief defect is the lack of descriptive methodology, but "cloning cookbooks" such as *Molecular Cloning: A Laboratory Manual* (T. Maniatis, E. F. Fritsch, and J. Sambrook, Cold Spring Harbor Laboratory, 1982) are becoming available for neurobiologists who want to employ molecular genetic techniques. As an introduction to neuroscience for molecular biologists the volume is less successful. The diversity of research being pursued by neurobiologists is not well represented, and scientists interested in such material would do better to investigate the Neurosciences Study Program series or the *Annual Review of Neurobiology*.

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Ultramafic Magma

Komatiites. N. T. ARNDT and E. G. NISBET, Eds. Allen and Unwin, Boston, 1982. xviii, 526 pp., illus. $75.

Whether ultramafic melts exist was a subject of vigorous debate for more than 50 years. The debate was put to rest in the late 1960's by the definitive work of the Viljoen brothers on what were to become classic ultramafic melt occurrences in the Komati River Valley, Barberton Mountain Land. Ultramafic melts or komatiites now rank as the most exciting recent discovery in petrology, and it is not surprising that they have been the subject of many studies seeking to understand their nature and origin. Until the publication of *Komatiites*, however, there was no single work collating these studies, and there is no doubt that the book fills a hole in the geological literature. The question is, how well does it fill it?

The purchaser of *Komatiites* will get a collection of reviews of most of the ma-

jor occurrences of komatiites, plus some specialized papers discussing many of the intriguing aspects of this type of magmatism. The 29 papers have been grouped into seven sections, two of which (those on regional surveys and on the geochemistry and composition of the mantle in the Archaean) constitute more than half of the book. The other five sections, more or less equal in length, cover history and definitions, textures, alteration, economic geology, and petrogenesis.

The editors state that the volume has two principal objectives, to summarize present knowledge of komatiites and to present new information and emphasize areas of study in which problems still exist. They succeed quite well in the former but fail in the latter. Most of the work in the volume has been published elsewhere, with new data appearing only in a few papers on trace elements and isotopes. However, the book succeeds quite well as a review and is an excellent source of references, especially for the world's komatiite occurrences, many of which are given almost overly succinct treatment, though key references are cited.

The regional survey section is the longest in the book, comprising 12 contributions. Classic geological cross sections are given in only two of the 12. This reflects either the vast amount of work required before our understanding of the regional settings of these enigmatic rocks is satisfactory or the vast amount of work it is going to take to get today's crop of field geologists back to basics.

The contributions are generally well organized and the diagrams usually clear. Large print and an acceptable frequency of misprints make the book visually pleasing and easy to read. However, the photomicrographs are not of particularly high quality and have commonly been reproduced at a much larger size than is warranted by the information they carry. Whether the papers have abstracts seems to be based on whether their authors felt like providing them. Like most books of its type, *Komatiites* suffers from unbalanced coverage of the data and a lack of continuity between sections. Arndt and Nisbet have attempted to overcome these difficulties by including an introductory preamble to each section.

On the whole the book is a worthwhile acquisition for anyone interested in petrology, the mantle, igneous geochemistry, Archean geology, or simply teaching senior undergraduate geology. Certainly it provides a polite and informative reply to the student question, "Where should I go to read up on komatiites?" The specialized researcher will not find too much to excite him or her, however. *Komatiites* could be considered as a suitable companion volume to *Basalts*, edited by H. H. Hess and Arie Poldervaart, or *Andesites*, edited by R. S. Thorpe.

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Planetology

Formation of Planetary Systems. Formation des Systèmes Planétaires. Papers from a school, Grasse, France, Aug. 1980. A. BRAHIC, Ed. Cepadues, Toulouse, France, 1982. 894 pp., illus. 295 F.

Speculations about the origin of the solar system are undoubtedly as old as intelligent life on Earth. This volume is a snapshot of the speculations as of 1980. In a foreword, Curien attributes the passion of planetologists to rapid growth of their field in the era of space exploration. True, there are many new facts that were not at hand for Lucretius, Descartes, Buffon, Kant, or Laplace. But the facts at hand are sufficient only to color a very small part of a very large canvas that is still mostly blank. Thus, today's natural philosophers are still free to spin their creative hypotheses in the spirit of their illustrious predecessors. And spin they do. The book begins with Brahic's recounting of the history of speculation about the origin of the solar system. The tone is set by a lovely quote from Poincaré in which he concludes that despite a paucity of facts the human mind is irresistibly drawn to this topic. "It is for this reason that cosmogonic hypotheses are so numerous and varied; it is for this reason that every day new ones spring up, equally as uncertain but nevertheless as plausible as the more ancient theories."

Following the historical introduction the book is divided into four parts: Astrophysics and Cosmochemistry, Dynamical Evolution, The Solar System Today, and Other Planetary Systems and Life. Multipart lectures are interspersed with short contributed papers. Most of the lectures are thorough and useful. Part of their utility comes from their being introductory in nature, with the goal of teaching scientists in other fields. For example, two series of lectures, one by Burns and one by Greenberg, make a nice introduction (totaling almost 150 pages) to dynamical processes in the solar system. There is a wealth of information in lectures by Elmegreen, Lattimer, and Allegre in the part of the book on astrophysics and cosmochemistry. However, overall the book retains a free-wheeling spirit. Even the part The Solar System Today, which one would suppose to be factual, contains a potpourri of papers on some of the more speculative topics, such as planetary rings, the origin of the moon, the geological evolution of Mars, and the origin of the satellites of Mars. The introductory lecture series in this section is a highly readable and entertaining overview of the solar system by Owen. The section on other planetary systems and life consists of two very short contributions.

The major failings of the book have to do with details, but distracting details. I assume the book was produced from camera-ready typescript prepared in English by a mostly French-speaking staff, for typographical errors appear at the rate of about one per page. Higher-order errors such as scrambling of superscripted mass numbers or breaks in the text that were clearly meant to be filled in by an author I can only attribute to some breakdown in the editorial process. Hyphenation at the ends of lines is totally unrelated to syllables. There is no indication in the table of contents whether a paper is a short contribution or a lecture series; there are no running author or title headings at the tops of pages; and there is no index.

Nevertheless, the vigor and enthusiasm of the European planetary sciences community and the drive and sense of humor of the editor are strongly reflected in this very lively book.

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Books Received

Applied Atomic Collison Physics. Vol. 1, Atmospheric Physics and Chemistry. H. S. W. Massey and Dr. R. Bates, Eds. Academic Press, New York, 1982. xiv, 484 pp., illus. $67.50. Pure and Applied Physics, vol. 43-1.

Applied Electron Spectroscopy for Chemical Analysis. Hassan Windawi and Floyd F.-L. Ho. Wiley-Interscience, New York, 1982. x, 214 pp., illus. $45. Chemical Analysis, vol. 63.

Applied Therapeutic Drug Monitoring. Vol. 1, Fundamentals. Thomas P. Moyer and Roger L. Boeckx, Eds. American Association for Clinical Chemistry, Washington, D.C., 1982. 242 pp., illus. Paper, $15.

Applying Mathematics. A Course in Mathematical Modelling. David Burghes, Ian Huntley, and John McDonald. Horwood, Chichester, England, and Halsted (Wiley), New York, 1982. 194 pp., illus. $44.95. Ellis Horwood Series in Mathematics and Its Applications.

Archaeology of Urban America. The Search for Pattern and Process. Roy S. Dickens, Jr., Ed. Aca-

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