

to promote anthropology as an integral part of higher education. Margaret Meade, in her chapter, "Anthropology and an education for the future," touches upon the same point. "In the United States," she writes (p. 598), "anthropology has remained an inclusive and integrating discipline by successfully resisting the fragmentation which has occurred in most disciplines, which, as they become more specialized, with more workers, in more countries of the world, have progressively shattered into mutually noncommunicating parts. Anthropology has kept its own media of intradisciplinary communication. . . . [Anthropologists] work not only with generalizations about culture, but also with the descriptions of particular cultures; not only with generalizations about language, but also with the auditory records of the speech of particular Indians or particular South Sea Island tribes; not only with tables of prehistoric time, but also with the actual artifacts and skeletal bits from which these tables are constructed."

So far as subspecialization is concerned, those interested can find a great deal of concrete matter in the sections of the book that deal with the teaching of physical anthropology, cultural and social anthropology, archeology, anthropological linguistics, regions and civilizations, and applied anthropology. There are three or more contributions to each of the sections. Evidence reflected here shows that, in specialized areas, anthropology today is probing its material in greater depth and with increasing analytic refinement. It is particularly important that the full implication of this kind of research be adequately transmitted during the educational process. At the same time, interdisciplinary contacts have been augmented. There are six papers in the section that deals with this topic. Included are relations with the social sciences (Casagrande), the biological sciences (Spuhler and Livingstone), the humanities (Leslie), education (Kimball), public health (Paul) and law and government (Hoebel and Rossow). It seems curious that relations with psychology and psychiatry are not dealt with. The final section (11), Perspectives on Anthropological Teaching, contains papers entitled "Value aspects of teaching anthropology" (Ethel M. Albert), "Anthropology as an integrative factor" (Ehrich), "Objectives for a liberal education" (Ray), and the previously mentioned chapter by Margaret Mead. Those outside the profes-

sion should find this section of particular interest.

The editors are to be congratulated on the immense task they have brought to such a successful conclusion. The project had the full support of the American Anthropological Association and was financed by the Course Content Improvement Section of the National Science Foundation. A preliminary step in the project was a series of ten symposia, held during 1960 and 1961, one of them in Europe under the sponsorship of the Wenner-Gren Foundation. The papers included in these volumes were presented and discussed at the symposia and later revised for publication. The 51 contributors, with biographical information, are listed in *The Teaching of Anthropology*. Although most of the participants were Americans, four British (Beattie, Firth, Fortes, and Little) and one Norwegian (Gjessing) anthropologist are numbered among them.

A. IRVING HALLOWELL
*Department of Anthropology,
University of Pennsylvania*

Sukhumi Primate Studies

Comparative Pathology in Monkeys.

B. A. Lapin and L. A. Yakovleva.
Translated from the Russian by the
U.S. Joint Publications Research
Service. Thomas, Springfield, Ill.,
1963. xvi + 272 pp. Illus. \$10.

This monograph summarizes observations made at the Institute of Experimental Pathology and Therapy, Academy of Medical Sciences, U.S.S.R., which is located at Sukhumi in the Russian state of Georgia. For many years a large primate colony has been maintained at Sukhumi, which has a warm, humid, semitropical climate. The colony consists of about 1000 animals, primarily rhesus monkeys (*M. mulatta*) and hamadryas baboons (*C. hamadryas*); it is regularly replenished by the introduction of wild animals. There are indoor cage facilities for use in acute experiments and open-air cages for the year-round housing of breeding animals.

This book presents a study of naturally occurring diseases as they have been observed in the colony. Included are clinical studies made during the years from 1927 to 1959 and pathological studies (1274 autopsies) made between 1952 and 1959. The data are presented by disease entities, with particular em-

phasis on those conditions which have been most commonly recognized, including dysentery, tuberculosis, parasitic infestations, and atherosclerosis and hypertension.

It is clear that this monograph represents a valuable and unique contribution to our knowledge of spontaneously occurring illnesses in captive primates. However, judging by those sections that I can assess critically, the quality of the Sukhumi studies is somewhat variable. Thus, the photomicrographs used throughout the book to illustrate histopathology indicate that many of the pathological preparations were of poor quality, and the descriptions of pathology tend to be wandering and discursive at times. In the chapter on dysentery, the bacteriological studies of causative organisms are not described very clearly or systematically.

Despite such limitations, this monograph reports a number of important contributions. The chapter on tuberculosis documents the important observation that, contrary to common impressions, captive monkeys living under favorable circumstances are not necessarily much more susceptible to tuberculosis than humans and that they may experience chronic as well as acutely fatal infections. The studies of cardiovascular disease show that spontaneous hypertension and coronary insufficiency are quite frequent in monkeys that are kept in small cages and used repeatedly for acute experiments, while those that are kept in large outdoor cages rarely develop such disease.

In summary, this book will be of interest to all workers concerned with the study of primates, or with their use as experimental animals.

NEAL NATHANSON
*Department of Anatomy, School of
Medicine, Johns Hopkins University*

Metallurgy

Columbium and Tantalum. Frank T. Sisco and Edward Epremian, Eds.
Wiley, New York, 1963. xviii +
635 pp. Illus. \$27.50.

One of the best ways to document the growing importance of the technology of columbium and tantalum is to list the symposia, the monographs, and the reference works on these metals, which have appeared during the last 5 years. They include the proceedings of two symposia, *Technology*

of *Columbium* (1958), edited by B. W. Gonser and E. M. Sherwood, *Columbium Metallurgy* (1961), edited by D. L. Douglass and F. W. Kunz, and a monograph entitled *Tantalum and Niobium* (1959), by G. L. Miller.

The book under review, *Columbium and Tantalum*, consists of 14 chapters written by different authors, all members or former members of the Union Carbide organization. It is a monograph in which all the available information on the subject has been systematically assembled rather than the proceedings of a symposium in which individual contributors report the results of their own research. Union Carbide's Metals Research Laboratory (Niagara Falls, N.Y.), has been one of the most active among the organizations responsible for the very rapid development of columbium and tantalum technology. This guarantees that all those who contributed chapters are recognized authorities in their fields.

The main emphasis is on the metallurgy of columbium and tantalum base alloys, including the pure metals. Consolidation by powder metallurgy and vacuum melting, mechanical working and joining of the metals and their alloys, their physical and mechanical properties, their corrosion and electrochemical behavior, their reaction with atmospheric gases, their alloying behavior, and their metallography are discussed in the principal chapters of the book. In addition, three introductory chapters treat the occurrence and preparation of ores, the extraction and separation of columbium and tantalum, and the methods of reducing their compounds into metals, and three final chapters give a cursory and necessarily incomplete discussion of the analytical chemistry, the applications, and the chemistry of the compounds of the metals.

In many chapters the authors have included data from unpublished work at the Metals Research Laboratory. By using these data, they have often succeeded in bringing order into the confused picture that has resulted from contradictory data in the literature. This must be considered one of the most valuable features of a book that will be an indispensable reference volume for all those actively engaged in work on columbium and tantalum metallurgy.

F. V. LENEL

Department of Materials Engineering,
Rensselaer Polytechnic Institute

Geological Processes

Physical Geochemistry. F. Gordon Smith. Addison-Wesley, Reading, Mass., 1963. x + 624 pp. Illus. \$15.

Physical chemistry is being applied widely to geological problems, with major emphasis on physical geology, and, in most departments of geology, a course in physical chemistry is now required for an advanced degree in physical geology. Increasingly, this requirement is being met by courses given in geology departments. It is gratifying, therefore, that this book, the first textbook entitled *Physical Geochemistry*, originated in a department of geology. The author teaches in the department of geological sciences at the University of Toronto.

Smith clearly states in his preface that he intended the book to apply only to the geochemical problems of igneous petrology and (related) mineral deposits. Thus, it is unfortunate that he used a general title. Even for this restricted scope, his theoretical treatment (part 1) is inadequate. There is a chapter on the structure of matter, three on crystals, a short one on liquids, a very brief chapter (three pages) on gases and gaseous solutions, and a comprehensive discussion of heterogeneous equilibrium and phase diagrams. There is no systematic or adequate treatment of such topics as thermodynamic principles or laws, thermodynamic properties of naturally occurring materials, the properties of solutions, chemical kinetics, chemical statistics, and Eh-pH relations.

Part 2 is largely a presentation of systems (silicate-water-sulfide) and discussions of their application to problems of petrogenesis and ore formation, but four chapters in the section appear to be out of place. The one on geothermometry and geobarometry is not a compilation but a discussion of the theory of the methods used; this chapter might have been more appropriately placed in part 1. Chapters 15, 16, and 17 are largely concerned with the chemical composition of igneous rocks and ore deposits of the earth's crust. This is descriptive geochemistry and might well have been omitted.

At the beginning of chapter 10 there is a table in which are listed 28 of the "more important silicate phase diagrams of petrogenetic interest," complete with literature references. Diagrams for only nine of these are reproduced, but diagrams for ten systems

not listed in the table are given, mostly without any credit line or reference in the text or in the legend. For the majority of these diagrams, and for those in chapter 12, it is impossible to tell whether they were taken directly from the literature, whether they have been modified, or, in a few cases, whether they are calculated or hypothetical diagrams.

If one wishes to teach a course that has just the scope of the one taught at the University of Toronto, he will find it very convenient to have available, in one volume, the pertinent data and references given here. But those who wish to include other material will prefer a more comprehensive treatment of the physical chemistry of geological processes, for with a more comprehensive textbook each instructor can choose the material he wishes to use.

EARL INGERSON

Department of Geology,
University of Texas

Astronomy

Stars and Galaxies. Birth, ageing, and death in the universe. Thornton Page, Ed. Prentice-Hall, Englewood Cliffs, N.J., 1962. xiii + 163 pp. Illus. Paper, \$1.95; cloth, \$3.95.

Innovation in astronomical concepts and techniques has doubled the number of articles published in each volume of the *Astrophysical Journal* since 1950. During these years, all of today's large radio telescopes have been constructed and the radio data have been integrated into the mainstream of astrophysical thought. We could only guess about the existence of cold interstellar hydrogen before its 21-centimeter radiation was detected in 1951; subsequent observations have given us a radically new picture of galactic structure and galactic motions. In this same period radio observations revealed that sources scattered all about the sky are radiating prodigiously by poorly understood non-thermal processes.

During these same years, astronomers who worked at optical wavelengths have raised photoelectric techniques to a new order of sophistication. Image intensifiers have borne their first fruits in observations of sources too faint to be studied otherwise. The use of electronic computers has become routine in the reduction of large quantities of observational data and in the construction of