limnological studies have resulted in fragmentation that makes it difficult for an investigator to keep abreast with all developments. This volume is an attempt to bring together much scattered information on the historical progression and current status of limnology in the complex and vastly different environments in North America. To accomplish this objective, the continent was divided into a number of regions and at least one active limnologist in each area summarized its limnology. In chapters devoted to such descriptions, 19 geographic areas are discussed: Wisconsin (the Birge-Juday Era and the years 1940 to 1961); Michigan; New England; Illinois; the Middle Atlantic States; the Central States; the South Atlantic States; the Central Gulf States and the Mississippi Embayment; Minnesota and the Dakotas; the Mid-Continent States; the Rocky Mountain States; the Pacific Coast and Great Basin; the American Southwest and Middle America; the West Indies; Western Canada; Ontario and Quebec; the Atlantic Provinces of Canada; the St. Lawrence–Great Lakes; and Alaska, the Yukon, the Northwest Territories, and Greenland.

Several chapters deal with topics that do not fit into the regional approach—the impact of reservoirs, farm ponds, paleolimnology, sanitational limnology, and a history of the American Society of Limnology and Oceanography.

In an appropriate concluding chapter entitled the "Prospect before us," G. E. Hutchinson discusses directions for research which range from paleolimnology to cross-disciplinary studies in biogeochemical processes and relationships. He appeals for imagination in pursuing theoretical interpretations, using mathematical apparatus, models, and information theory, and emphasizes the need for developing more perfect instruments and techniques and for studies on new aspects, such as the challenging study of running waters.

Perhaps the greatest criticism of a work of this scope in which so many authors were involved, will be that, owing to the relative interest of the various contributors, some regions or topics are more intensively explored than others. However, no previous book has sampled the literature on the limnology of North America as extensively as this one does, and the volume should stimulate limnologists to follow-up with publications of their own work.

Limnology in North America should be widely used as a reference source, for it supplies valuable basic and introductory information, concisely presented, on the many facets of aquatic environments; thus, it will free instructors to emphasize recent findings and students to work on special topics.

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Geology

Geologie von Paraguay. Hannfrit Putzer (Beiträge zur Regionalen Geologie der Erde, vol. 2. Alfred Bentz, Ed.). Borntraeger, Berlin, 1962. xii + 183 pp. Illus. DM. 78.

Paraguay, the "Garden of South America," is divided geographically by the Paraguay River into a hilly eastern region that is rich in water and covered with tropical and subtropical forests and a western region, the Chaco Boreal, that is a vast area of lowlands with swamps, savannas, and brush forest.

Three distinct geological units characterize this country: Eastern Paraguay, the western border of the Parana Basin, is made up of Pennsylvanian, lower and middle Permian, and Triassic sediments, together with a few local remnants of beds of Cretaceous age; the north-south trending Central Paraguayan Swell, a continuation of the pre-Cambrian crystalline rocks of the Brazilian Shield, unconformably covered in the north by marine sequences of pre-Cambrian and Cambrian age, in the south by Silurian sandstones, and along the Paraguay River by Triassic beds; and the geosynclinal Chaco Boreal where the basement rocks are overlaid in the northeast with outliers of early Paleozoic carbonate sediments; the center of the geosyncline is filled with a thick series of marine Silurian and lower Devonian rocks that are covered by terrestrial red beds of Triassic age and by semiconsolidated clastic Cenozoic deposits.

About half of Putzer's book is devoted to a detailed description of the stratigraphy of each of the three mentioned geological units; this is followed by short chapters on tectonics, paleogeography, and mineral resources. The country, however, is poor in ores. Shortly after World War II the Union Oil Company of California drilled nine wells without finding deposits of gas and oil suitable for commercial development, but Putzer is of the opinion that the last word has not been said with respect to this matter. If properly mined and exploited, nonmetallic minerals—such as mica, feldspar, talc, kaolin, and bauxite—may become economically important to the country.

Friedrich Bender contributed a chapter on the hydrogeology of the immense Chaco Boreal region (which comprises 60 percent of Paraguay's total area). This chapter, as well as the chapter on soils (by Putzer), should be of great interest to future settlers in Paraguay.

The book, which is based on Putzer's personal experience, incorporates all the pertinent geological facts and observations so far published. A colored geological sketch-map and two plates with fossils from Silurian and Devonian sediments are included. Two earlier compilations [by Horacio Harrington (1956) and Edwin B. Eckel (1959)] also treat this area, but Putzer's well-written and well-printed book is so far the most complete one that deals with all aspects of the geology of this landlocked country in the center of the South American subcontinent. *Geologie von Paraguay* will be of great value to any future geological exploration in Paraguay.

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Chemistry of the Universe

Space Chemistry. Paul W. Merrill. University of Michigan Press, Ann Arbor, 1963. 166 pp. Illus. Cloth, $5; paper, $1.95.

Space Chemistry was designed by the late Paul Merrill as a short book on the present state of knowledge of the chemistry of the universe as well as a discussion of some of the most pressing problems now being investigated. The book, which is intended for general readers, is so full of interesting information and discussion that the strictly general reader may find it a bigger bite than he can comfortably chew. On the other hand, the scientific reader who is not intimately connected with the field (and I include myself in this group) will find it most valuable and enjoyable. The emphasis is placed on understanding the synthesis of astronomy, chemistry, and physics in research on the nature and evolution of the universe. Dr. Merrill's distinguished career literally grew up with the development of modern spectros-