been treated from a different viewpoint by Gunnar Myrdal in *Rich Lands and Poor, the Road to World Prosperity* (1958).

Malthus was one of the first to analyze the problem of world population and food supplies. Stamp is the latest. *Our Developing World* is very good in its treatment of land, population, and agricultural resources, less so in its treatment of energy and mineral resources. It is written not for the specialist in population or agriculture but for the layman and the specialist in other fields who lacks background on this most urgent of problems.

WALTER DESHLER
*Department of Geography,*
*University of Maryland*

**Principles of Mineralogy.** William H. Dennen. Ronald, New York, 1959. v + 429 pp. Illus. $7.50.

During this last year there has been a rash of new textbooks and new editions of old established works on mineralogy. These include, in addition to the book here reviewed, the following: *Mineralogy* by Kraus, Hunt, and Ramsdell (McGraw-Hill, New York, ed. 5, 1959); *Dana's Manual of Mineralogy* by C. S. Hurlbut, Jr. (Wiley, New York, ed. 17, 1959); and *Mineralogy, Concepts, Descriptions, Determinations* by E. G. Berry and Brian Mason (Freeman, San Francisco, 1959). Recently it was announced that a fifth volume would be published: "Elements of Crystallography and Mineralogy" by F. Alton Wade and Richard B. Mattox. Of the first four, two are essentially traditional in their approach (the two revised editions), but the other two contain numerous innovations of treatment and organization.

This volume by Dennen is divided into two parts: part 1, "General principles," and part 2, "Mineral descriptions." It contains no identification tables but has mineral and subject indexes. Part 1 begins with a chapter on symmetry; in essence, it is a chapter on crystallography, but it lacks many of the standard features. It does not deal with such subjects as the representation of crystals by projections or the determination of crystal faces by means of goniometry. Chapter 2, entitled "Fundamentals of crystal chemistry," considers the architecture of atoms (including nuclear progression, electronic cloud, and quantum states), periodic classification, intrinsic atomic properties, bonds and bonding, and the size and shape of atoms and ions. In chapter 3, which is vaguely entitled "Mineralogical relations," Dennen discusses chemical variation in series and groups and geometrical variations (polymorphs, twinning, and crystal imperfections). In "The physical characteristics of minerals" (chapter 4) he describes not only the several physical and optical properties of minerals but also includes a section on electrical, magnetic, and thermal properties as well as a discussion of crystal growth and habit.

Most of the standard chemical tests for the important elements as well as a discussion of the use of the blowpipe are presented in chapter 5; on page 154 of this chapter there is an extraordinary illustration—a line drawing of a student using the blowpipe as seen from a point directly overhead. Such topics as classification of matter, number and abundance of minerals, mineral classification, and mineral interrelationships are discussed in chapter 6. Emphasis here is on the description of the structures of the ionic species, with a great many drawings of crystal structures.

Part 2, involving mineral descriptions, has but one chapter. The breakdown is by the conventional system of classification: native elements, sulfides, sulfosalts, halides, oxides, hydroxides, oxygen salts (8 subdivisions), and finally silicates. Each species is described under the following headings: crystallography, structure, habit; physical properties; distinctive properties and tests; association and occurrence; alteration; confused with; variance; and related minerals. Some 150 species are described; yet the mineral index lists approximately 600 mineral names. Although most of the names are to be found in the section on mineral descriptions, they are mentioned but briefly as minerals related in various ways to those described in greater detail. There are no drawings of crystals and no photographs of specimens. The section does include representations of the structures of some of the species and a few reproductions of pencil drawings of crystalline groups or crystals. The lack of significant illustrations and the omission of reference to specific deposits, classical or economic, represents a most unfortunate feature, because this tends to impart a degree of abstractness or unreality to the mineral descriptions.

The book, which is "intended for an introductory college course in mineralogy," may serve well as a text for such a course intended for embryonic physicists, chemists, and crystallographers, but it seems inappropriately organized to interest and stimulate beginning mineralogists and geologists.

E. WM. HEINRICH
*Department of Mineralogy,*
*University of Michigan*

**Les Mekhadma.** Etude sur l'évolution d'un groupe humain dans le Sahara moderne. Arts et Métiers Graphiques, Paris, 1960. 224 pp. Illus. + maps.

*Les Mekhadma* is a study of a largely sedentary (though formerly pastoral nomadic) Arab tribe caught up in the whirl of the Saharan oil boom. The study is devoted mainly to descriptions of experiments carried out by a team of specialists from PROHUZA (Centre d'Etudes et d'Informations des Problèmes Humains dans les Zones Arides). The experiments involved a great variety of procedures designed to select, mainly by psychometric means, the most able local candidates for employment in an oil field. Also included are a brief history of the Mekhadma, a summary description of their culture, and a rough sketch of the adult male physical type.

The primary objectives of the project were to develop aptitude tests applicable to Saharan native laborers and to learn enough about Mekhadma culture to be able to counteract, at least to some extent, the disruptive effects of sudden and violent contact with European oilfield culture. Therefore, the sociological and psychological sections are slanted strongly by economic emphasis, and they reveal very little concerning either personality or culture beyond those elements whose practical importance seemed obvious to the investigators.

It is regrettable that the authors could not present more information concerning social and political structures, physical anthropology, and health and disease among the community as a whole. But this was not entirely their fault. On the one hand, they were feeling their way in the semidarkness of an almost completely new field of investigation, and they prudently avoided biting off at the start more than they could reasonably expect to chew; on the other hand, their professional enthusiasm was strictly channeled by

their commercially minded paymasters. Nevertheless they managed to collect a good deal more information than was published, and their picture of the Mekhadma can be improved considerably if funds for publication are made available.

In spite of its obviously serious shortcomings, *Les Mekhadma* is an important book; for it describes for the first time, in vivid colors and in minute and full detail, the over-all material effect of the shattering collision of a Saharan native culture with the explosive force of European industrial expansion.

This book is extremely valuable within the limits I have indicated; its presentation is luxurious and the photographs are magnificent. It is the first thing of its kind, and it could not be more timely.

LLOYD CABOT BRIGGS
*Peabody Museum,*
*Harvard University*

**The Correspondence of Isaac Newton.** vol. 2. 1676–1687. H. W. Turnbull, Ed. Cambridge University Press, New York, 1960. xiii + 552 pp. Illus. + plates. $25.

In the first volume of this monumental, long-awaited edition, we were presented with the juvenile Newton, blossoming into the ingenious optical experimenter, known (but none too widely) to his coterie within the Royal Society. Now, in the second volume, emerges the masterful mathematician, vying with Leibnitz over problems in their new methods of analysis and culminating his achievements with the greatest scientific book ever written, the *Principia Mathematica.*

Out of 162 letters (and manuscripts) here edited, some 66 are published for the first time and many others only now are printed in full and accurate versions. Even more than in the previous volume, the critical notes represent an editorial *tour de force* on which many generations of scholars will be able to lean.

Still, however, even at the height of his powers, Newton proves a disenchantingly impersonal correspondent, so that it comes almost as a warming refreshment when one or another of those writing to Newton goes beyond the bounds of strict scientific intelligencing. Amongst these, American readers should be especially interested to see for the first time the letters of Arthur Storer. Storer's father was a tenant of the Newtons at Woolsthorpe in Lincolnshire, and after some astronomical correspondence with Newton in 1678, Storer traveled to Maryland in the autumn of that year and, though lying sick there for some time, continued to write back news of observations and comets during the years 1681 to 1683.

The editing is so accurate that it is perhaps mete for a reviewer to swoop upon even minor errors. The letters between Gilbert Clerke and Newton (numbers 312 to 316) are said to be in possession of the Burndy Library, New York; however, that rich and most helpful institution is in Norwalk, Conn. On another matter concerned with the possession of manuscripts, it may not be altogether improper to remark that it seems a considerable scholarly annoyance to have some letter printed with merely the superscription "in private possession." It is, to be true, far better than not having the thing at all, but why, let us ask plaintively, must owners be so narrowly possessive or secretive that they will not tell us where to go to see the original?

In my review of the first volume [*Science* **131**, 1202 (1960)] I remarked that this set was to be one of our most valuable and cherished sources in the history of science. Now, with a pair of the volumes on the shelves, that high promise is evidently fulfilled, and I wait all the more eagerly for the rest of the set and for all the other Newton publications now to be unleashed.

DEREK J. DE SOLLA PRICE
*Department of the History of Science and Medicine, Yale University*

## Miscellaneous Publications

*(Inquiries concerning these publications should be addressed, not to* Science, *but to the publisher or agency sponsoring the publication.)*

American Fisheries Society. Committee on Names of Fishes. *A List of Common and Scientific Names of Fishes from the United States and Canada.* American Fisheries Society, Ann Arbor, Mich., ed. 2, 1960 (order from Secretary-Treasurer, American Fisheries Soc., Box 483, McLean, Va.). 102 pp. Paper, $1; cloth, $2.

Associação Portuguesa para o Progresso das Ciências. *Congresso Luso-Espanhol,* vol. 23. Celebrado na Cidade Coimbra de 1 a 5 de Junho de 1956. vol. 5, 4a, *Ciências Naturais;* 1a, *Mineralogia e Geologia;* 2a, *Botânica.* 528 pp. 3a, *Zoologia e Antropologia.* 176 pp. vol. 6, 5a, *Ciências Sociais.* 215 pp. vol. 8, 7a, *Ciências Históricas e Filólogicas.* 601 pp. vol. 9, 8a, *Ciências Médicas e Biólogicas.* 648 pp. vol. 10, 9a *Engenharia, Arquitectura e Outras Ciências Aplicadas.* The Association, Coimbra, Portugal, 1956–57.

Association Internationale de Géodésie. *Travaux,* vol. 20. Rapports généraux et rapports nationaux. vol. 2, *Nivellement de précision.* Secretariat de l'Association, Paris, 1958.

Agricultural Research Council. Radiobiological Laboratory. *Strontium–90 in Milk and Agricultural Materials in the United Kingdom, 1958–1959.* British Information Service, New York, 1960. 91 pp. $0.95.

American Philosophical Society. *Transactions,* vol. 50, pt. 6, "The Paleocene Pantodonta." Elwyn L. Simons. American Philosophical Society, Philadelphia, Pa., 1960. 88 pp. $2.50.

Argentina, Academia Nacional de Medicina. *Boletin de la Academia Nacional de Medicina.* vol. 37. Ministerio de Educacion y Justicia, Buenos Aires, 1959. 566 pp.

Australia. Division of Land Research and Regional Survey. *Technical Paper,* No. 8, "The establishment of pasture species on arable land at Katherine, N.T.," M. J. T. Norman, 18 pp.; No. 9, "Performance of annual fodder crops at Katherine, N.T.," M. J. T. Norman and R. Wetselaar, 16 pp.; No. 10, "Soil and crop nitrogen at Katherine, N.T.," R. Wetselaar and M. J. T. Norman, 18 pp.; No. 11, "Performance of buffel grass and buffel grass-townsville lucerne mixtures at Katherine, N.T.," M. J. T. Norman, 14 pp. *Soil Publication,* No. 16, "The development and distribution of the soils of the Swan Coastal Plain, Western Australia," W. M. McArthur and E. Bettenay. Commonwealth Scientific and Industrial Research Organization, Melbourne, 1960.

British Museum (Natural History), London. *Bulletin.* Botany, vol. 2, No. 7, "The identity of *Isopyrum aquilegioides* L., Gavin de Beer and William T. Stearn., 10 pp. 6s. Entomology, vol. 9, No. 3, "Sphecidae (Hym.) Recoltes en Tripolitaine et en Cyrenaique par M. Kenneth M. Guichard." 52 pp. 12s. Geology, vol. 4, No. 5, "A review of the Upper Jurassic Pliosaurs." Lambert Beverly Tarlo. 45 pp. 24s. The Museum, London, 1960.

Chicago Natural History Museum. *Fieldiana: Botany,* vol. 30, No. 3, "Orchids of Peru," Charles Schweinfurth, 253 pp., $4.50. *Geology,* vol. 11, No. 10, "Fishes of the Devonian Holland Quarry shale of Ohio," Robert H. Denison, 60 pp., $1.50. *Geology,* vol. 14, No. 1, "The stratigraphy of the Devonian Holland Quarry shale of Ohio," J. Ernest Carman, 5 pp., $0.15. *Zoology,* vol. 39, No. 35, "Two eels of the genus *Synaphobranchus* from the Gulf of Mexico," P. H. J. Castle, 12 pp., $0.30. *Zoology,* vol. 39, No. 36, "A new genus of blind beetles from a cave in South Africa," Henry S. Dybas, 6 pp., $0.20. *Zoology,* vol. 41, No. 2, "Birds of Gabon and Moyen Congo," Austin L. Rand, Herbert Friedmann, and Melvin A. Taylor, Jr., 218 pp. Chicago Natural History Museum, Chicago, Ill., 1960.

Osaka University. Institute for Protein Research. *Memoirs.* vol. 2. The Institute, Osaka Univ., Osaka, Japan, 1960. 287 pp.