Review

GEOLOGY OF THE NONMETALLICS, by *Peter W. Harben* and *Robert L. Bates*, 1984, Metal Bulletin, Inc., 708 3rd Ave., New York, New York 10017, 393 pp. ($52.00, hardbound).

This book on the geology of the nonmetallics (industrial minerals) gives the reader an excellent worldwide view of many economically important nonmetallics. Since Robert L. Bates published *Geology of the industrial rocks and minerals* in 1960, the value as well as the study of nonmetallics, or industrial minerals, has greatly expanded. This new book is a concise but comprehensive up-to-date look at many industrial minerals. New Mexico is prominently mentioned.

The introduction sets the stage by first describing the classification used and then the importance of physical properties of nonmetallics, recent developments, industrial complexities, and additional newer sources of information. The rest of the book is organized into a genetic classification of industrial minerals, which is divided into igneous (intrusive, pegmetitic and hydrothermal, and extrusive), sedimentary (clastic, biogenetic, and chemical), surficially altered, and metamorphic groups. Each section contains a description of and information on the geology and production of a specific commodity or group of commodities; up-to-date references are included. New Mexico is the identified source of perlite, scoria and pumice, mica, barite, salt, gypsum, and potassium minerals and the leading producer of perlite and potassium minerals in the U.S.

Harben and Bates state that perlite is a glassy, volcanic rock with 2–5% combined water. Upwards of 85% of the U.S. perlite production comes from New Mexico where the deposits are widely distributed in rhyolitic volcanic fields. Commercial operations are located at No Agua Peaks and Brushy Mountain northwest of Taos, East Grants Ridge northeast of Grants, and the Socorro–Magdalena area near Socorro. Other deposits are north and south of Silver City. Harben and Bates indicate that the East Grants Ridge deposit is "west of Albuquerque" and that the material near Silver City is "west of Las Cruces," because of their readers' incomplete knowledge of New Mexico. *Geology of the nonmetallics* describes all of these New Mexico deposits in fair detail and, in addition, includes the major perlite deposits in the world.

The description of the New Mexico potash deposits is necessarily limited. These deposits were developed in the 1930's through 1950's and satisfied the bulk of the U.S. demand during those years. However, with the development in the 1960's of rich Canadian deposits, especially in Saskatchewan, the importance of the Carlsbad deposits has diminished; they now supply only about one quarter of the U.S. need. Other deposits in the U.S., such as those in Utah, are discussed briefly. The majority of the section on potassium minerals is on the large Canadian and European deposits, as it should be.

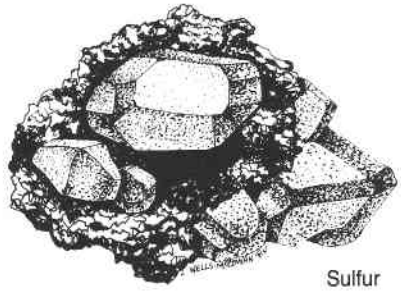
New Mexico's deposits of scoria and pumice, mica, and salt are mentioned briefly. Harben and Bates also merely indicate that there are occurrences of barite and gypsum in New Mexico.

The other authoritative reference on industrial minerals is the AIME's *Industrial minerals and rocks* (5th edition), edited by S. J. Lefond. This two-volume set goes into greater detail on each of the commodities and groups of commodities presented. Although Bates and Harben tend to limit their coverage, they still seek adequate discussions of the geology, use, and production information necessary for the reader to understand why some deposits are economic and others are not. This approach is valuable because one must have an appreciation of the economics to judge the importance of mineral deposits.

For anyone who wants a quick review of industrial minerals as well a fair amount of detail on the geology and economics of these commodities both in the U.S. and abroad, Harben and Bates' volume is an excellent reference book. It is well written, contains many maps and locations of significant deposits, includes a reference list for each commodity discussed, and is easy to use. *Geology of the nonmetallics* is not meant to be a book one reads from cover to cover. It is a summation of useful information on these important commodities. For this purpose I find it very useful.

I have only two minor criticisms, one of which is the title. After fighting for so many years to introduce the term "industrial minerals" or "industrial minerals and rocks" into the literature, Bob Bates seems to have acquiesced to the wishes of his British-trained co-author. I personally prefer to be "positive" about the subject, rather than identify the subject as something it is not—"not metallics." My second criticism is the price; $52.00 appears to me to be somewhat out of line with the size of the book. On the other hand, one must expect this of books on fairly esoteric subjects. Aside from these small distractions, I would strongly recommend that geologists, mining engineers, and others interested in industrial minerals acquire this book.

—*George S. Austin*



Sulfur

Gallery of Geology photos needed

Please send excellent-quality black-and-white photographs of a geologic feature or area (in New Mexico) with a short geologic description for this not-often-used feature column. Submit the photo(s) and accompanying description to Deborah Shaw, Editor, *New Mexico Geology*, New Mexico Bureau of Mines and Mineral Resources, Socorro, NM 87801 (505/835–5112).

Summary of New Mexico state taxes on natural resource production as of December 1, 1984

compiled by *James M. Barker*

Commodity	Tax	Rate and base
Potash	Resource; Processor; Service*	0.5% of taxable value 0.125% of taxable value
Molybdenum	Processor; Service*	0.125% of total value
Other taxable resources	Processor; Service*	0.75% of taxable value
Copper	Severance	0.5% of gross value
Gold, silver	Severance	0.20% of gross value
Potash	Severance	2.5% of gross value
Lead, zinc, molybdenum, manganese, thorium, rare-earth, and other metals	Severance	0.125% of gross value
Clay, gravel, gypsum, sand, pumice, and other nonmetals	Severance	0.125% of gross value
Coal: surface underground	Severance Severance	99.4¢ per ton 95.9¢ per ton
Uranium	Severance	3.75% of taxable value (per lb U_3O_8) 3.5% of 50% of sales price
Oil and liquid hydrocarbons	Oil and gas severance	3.75% of taxable value
Gas	Oil and gas severance	14.7¢ per 1,000 ft^3
Carbon dioxide	Oil and gas severance	3.75% of taxable value
Oil, gas, liquid hydrocarbons, and carbon dioxide	Oil and gas privilege	3.15% of taxable value
	Oil and gas ad valorem production	Many rates (certified annually on September 1 to Oil and Gas Accounting Division)
Oil, gas, liquid hydrocarbons, geothermal energy, carbon dioxide, coal, and uranium	Oil and gas conservation	0.18% of taxable value
Gas and hydrocarbons incidental to processing	Natural gas processor	0.45% of taxable value

*subject to only one of these taxes at a given time. Data source: Taxation and Revenue Department, Severance and Resources Excise Tax Bureau, Santa Fe, New Mexico (505/827–5849).