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WHERE TO FIND INFORMATION
ON MINERAL RAW MATERIALS

BY

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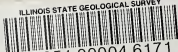


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WHERE TO FIND INFORMATION ON MINERAL RAW MATERIALS*

BY

M. M. LEIGHTON

Minerals are often important raw materials for chemical operations, but the chemical market research man is not usually conversant with the field. Many information sources are available to help him find the field.

THE PROBLEM of surveying the mineral raw material supply by the chemical market researcher may be simple or difficult, depending on what the mineral raw materials are, what use is to be made of them, in what quantity they are desired, whether or not they are to be obtained on the open market or are to be produced from deposits, and how familiar the researcher is with the mineral field and the sources of information.

In this paper it is assumed that a chemical manufacturing plant is being planned that will require mineral raw materials in large amounts, either for conversion into a manufactured product or for use as processing materials.

MINERAL SPECIFICATIONS

The first thing to be done is to compile carefully and critically the specifications of composition, properties, and amounts of the mineral or minerals that will be required. Minerals in the natural deposits are almost invariably impure, or have a range in composition, or are intimately mixed with other minerals. Tolerance in composition and properties should, of course, be determined. The mineral variety may be important.

Silica, as an example, is available in the forms of quartz veins, quartzite rock, sandstone made up of quartz grains, tripoli, or diatomite. For some purposes it is conceivable that any one of these might serve, according to their costs, but for many other purposes only one or two of these varieties would serve because of certain fundamental

differences in crystal structure and properties, and in cost of extraction and preparation.

Therefore, it may be necessary, after having determined the composition and properties of the mineral substance desired, to consult reference books such as Dana's "System of Mineralogy," Dana's "Manual of Mineralogy," or "Industrial Minerals and Rocks," or other similar volumes (see list of reference books appended to this article); then turn to sources of information on resources.

INFORMATION SOURCES

The geology and mineral resources of the United States have been subjects of study for many decades, but because of their hidden occurrence and the vastness of the field, there is much yet to be learned. We shall consider here the general sources of published information in economic geology and mining. In some cases state and federal geological and mining bureaus can furnish information not yet published.

The most prolific sources of such information are the U. S. Geological Survey, the U. S. Bureau of Mines, and the many state geological surveys and mining bureaus. (A list of these with their addresses is herewith appended.) The information of the federal and state surveys and bureaus in some instances supplements each other and neither should be neglected. Lindgren's "Mineral Deposits," Bateman's "Economic Mineral Deposits," Ries' "Economic Geology," Emmon's "Principles of Economic Geology," McKinstry's "Mining Geology," "Minerals

* Presented before the meeting of the Chemical Market Research Association, St. Louis, Missouri, April 4-5, 1949.

Yearbook" published annually by the U. S. Bureau of Mines, "Mineral Industry" published annually by McGraw-Hill, "Industrial Minerals and Rocks" published by the A.I.M.M.E., "The Stone Industries" by Oliver Bowles, "Materials Handbook" by Brady, and "Mineral Resources of the United States" published by Public Affairs Press are among the useful reference books that may be named.

The publication lists of the federal and state geological surveys and mining bureaus are desirable to have at hand. In addition, one should have access to the "Annotated Bibliographies of North American Geology," published by the U. S. Geological Survey, the "Bibliography and Index of Foreign Geology" published by the Geological Society of America, the "Annotated Bibliography of Economic Geology" published by the Economic Geology Publishing Co., the "Engineering Index," "Chemical Abstracts," the technical publications of the American Institute of Mining and Metallurgical Engineers, and others in this field.

Other sources of information and assistance are the specialists and consultants in geology and mining at universities and in private practice.

Most of the state surveys can furnish lists of mineral producers, together with information about products. Information of a highly specialized order concerning geochemistry and geophysics is procurable from certain laboratories like those of the U. S. Geological Survey, U. S. Bureau of Standards, Pennsylvania State College School of Mineral Industries, the Illinois Geological Survey, and certain other industrial institutes and universities.

MARKET RANGE

Some mineral commodities have a narrow geographic market range: agricultural limestone, crushed rock, most structural clay products, certain coals, rock wool, etc.

Other mineral commodities have market areas of much wider range: coking coals, petroleum and natural gas, marble, granite, slate, Indiana limestone, kaolin,

bentonite, refractory brick, lightweight refractory brick, cement (in some cases), salt, bromine and other mineral salts, magnesite, fertilizers, abrasives, asbestos, fluorspar, feldspar, fuller's earth, glass products, graphite, monazite, mica, pigments, and other minor mineral products, mineral waters, metallic ores, alloying minerals, etc.

Information concerning the former group is obtainable from the state geological surveys. Information about the latter requires sources that are both state and national, and in some cases international.

Minerals which are not to be found in commercial quantities in this country are summarized in "Mineral Resources of the United States" published by Public Affairs Press, and information may also be obtained from specialists of the U. S. Geological Survey, of the U. S. Bureau of mines, and of certain universities and state surveys.

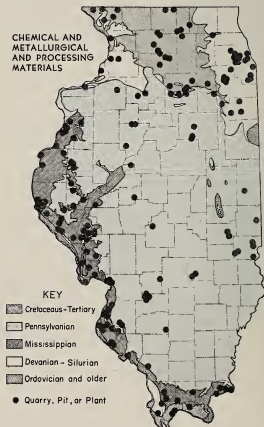


Figure 1.

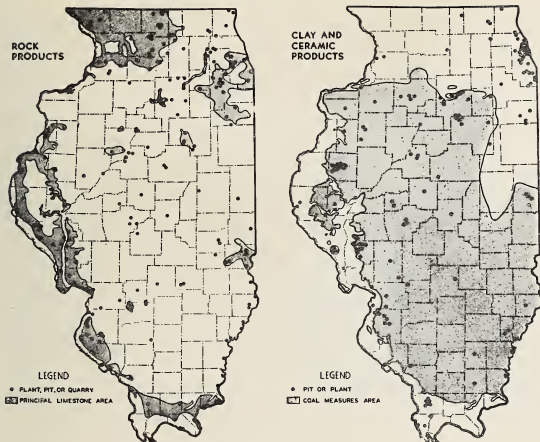


Figure 2.

INFORMATION AVAILABLE

It may be helpful to cite some specific examples of the nature of the information available. Examples are drawn, because of familiarity, from the work of the Illinois Geological Survey.

Figure 1, depicting the State of Illinois, shows the locations of plants producing raw mineral materials for the chemical, metallurgical, and processing industries. These include high-purity dolomites, high-calcium limestones, special types of clays, molding sands and bonding materials, fluorspar, abrasives, etc. The Illinois Geological Survey has a great deal of information on the composition, physical and chemical properties of these materials, their availability, and in some cases information on deposits that are not yet developed. The Survey maintains specialists in geology, physics, chemistry, and mineral economics, whom you may consult for information.

Figure 2 suggests that a large amount of information is available from the Illinois Geological Survey on many kinds of rock and rock products and clay and ceramic products.

Figure 3 also suggests the amount of information that the Survey has on the many occurrences of oil and gas in the State. This information includes the composition and physical properties of the crude oil. In addition, the Survey possesses much information on the brines found in many of these pools and in other drilling; likewise on the coals of the State and on their use as chemical raw material.

WATER SUPPLIES

The question of plant location is apt to be tied up very closely with the question of water supplies. Information on sources, physical and chemical properties, and quantities is usually available from the state geological surveys, state water surveys

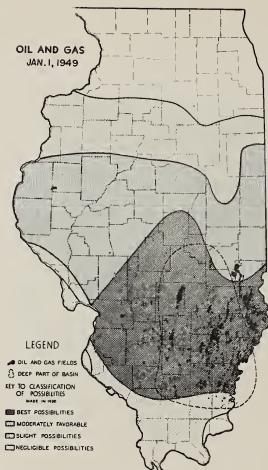


Figure 3.

and engineers, and U. S. Geological Survey. Public health aspects are commonly handled by the departments of public health in each state.

NEW TECHNOLOGIC USES

New technologic uses may be found in "Minerals Yearbook," "Mineral Industry," chemical publications and engineering journals. "Annotated Bibliographies" and the "Engineering Index" should be scanned.

Matters of mine, pit, or quarry development to supply the needs of a large company should, in due time, receive the attention of the company's engineers and consulting engineers. Plant locations should be considered in connection with the valuable information that can be supplied by the industrial agents and commissioners of most of the railroad systems, who have

information regarding local conditions and costs as well as transportation facilities.

The complexity of the mineral commodity field and the specialization in its various phases make it essential that the chemical market research worker who is interested in these commodities maintain a shelf of ready reference books and develop an acquaintance with the numerous sources of information that exist throughout this country. The information of the U. S. Geological Survey and the U. S. Bureau of Mines on foreign sources has been greatly amplified recently by foreign studies and by consideration of international mineral economics.

Specialized mineral economists in this country are comparatively few but they do exist in some state and federal organizations, in a few universities, and in specialized fields of industry. Those mineral economists who keep abreast of world-wide developments as well as national developments—politically, industrially, and technologically—often have valuable information on questions of long-time supplies.

The Economic Geology Publishing Co., a non-profit organization of research economic geologists set up to publish the "Journal of Economic Geology" (founded in 1905), is also prepared to cite sources of information. Inquiries to it may be sent to 100 Natural Resources Building, Urbana, Illinois.

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Federal Bureaus (Washington, D. C.)

Department of Commerce

Bureau of the Census, James C. Capt, Director
 Bureau of Foreign and Domestic Commerce, Amos E. Taylor, Director
 National Bureau of Standards, E. U. Condon, Director
 Patent Office, Casper W. Ooms, Commissioner of Patents

Department of the Interior

Bureau of Mines, James Boyd, Director
 Geological Survey, William E. Wrather, Director
 Oil and Gas Division, Max W. Ball, Director

State Geological Surveys

Alabama, Geological Survey of Alabama, University
 Arizona, Arizona Bureau of Mines, Tucson
 Arkansas, Office of State Geologist, Little Rock
 California, State Division of Mines, Department of Natural Resources, Ferry Building, San Francisco 11
 Colorado, Colorado Geological Survey Board, Golden
 Connecticut, Connecticut Geological Survey, Trinity College, Hartford 6
 Delaware, no geological survey
 Florida, Florida Geological Survey, Drawer 631, Tallahassee
 Georgia, Department of Mines, Mining and Geology, Atlanta
 Idaho, State Bureau of Mines and Geology, Moscow
 Illinois, State Geological Survey Division, Department of Registration and Education, Urbana
 Indiana, Division of Geology, Dept. of Conservation, Bloomington
 Iowa, Iowa Geological Survey, Iowa City
 Kansas, State Geological Survey of Kansas, Lawrence

- Kentucky, Kentucky Geological Survey, Rm. No. 5, Miller Hall, University of Kentucky, Lexington
- Louisiana, Louisiana Geological Survey, Louisiana State University, Baton Rouge 3
- Maine, State Geological Survey, Orono
- Maryland, Department of Geology, Mines and Water Resources, Baltimore 18
- Massachusetts, no geological survey
- Michigan, Geological Survey Division, Department of Conservation, Lansing
- Minnesota, Minnesota Geological Survey, Minneapolis 14
- Mississippi, Mississippi Geological Survey, University
- Missouri, Missouri Geological Survey and Water Resources, Rolla
- Montana, State Bureau of Mines and Geology, Butte
- Nebraska, Conservation and Survey Division, University of Nebraska, Lincoln
- Nevada, Nevada State Bureau of Mines, Reno
- New Hampshire, Mineral Resources Committee, New Hampshire State Planning and Development Committee, Durham
- New Jersey, Division of Geology and Topography, Department of Conservation and Development, Trenton
- New Mexico, New Mexico Bureau of Mines and Mineral Resources, Socorro
- New York, State Science Service, Office of State Geologist, Mineral Res. Division, Albany
- North Carolina, North Carolina Department of Conservation and Development, Raleigh
- North Dakota, North Dakota Geological Survey, Grand Forks
- Ohio, Division of Geological Survey, Department of Natural Resources, Columbus 10
- Oklahoma, Oklahoma Geological Survey, Norman
- Oregon, State Department of Geology and Mineral Industries, 702 Woodlark Building, Portland 5
- Pennsylvania, Topographic and Geological Survey, Department of Internal Affairs, Harrisburg
- Rhode Island, Mineral Resources Committee, Rhode Island Industrial Commission, Providence
- South Carolina, South Carolina Geological Survey, Columbia 19
- South Dakota, State Geological Survey, Vermillion
- Tennessee, Division of Geology, Nashville 3
- Texas, Bureau of Economic Geology, University of Texas, Austin
- Utah, Utah Geol. and Mineralogical Survey, Utah State Department of Publicity and Indus. Dev., Salt Lake City
- Vermont, Vermont Geological Survey, Burlington
- Virginia, Virginia Geological Survey, Conservation Commission, Charlottesville
- Washington, Division of Mines and Geology, Department of Conservation and Development, Olympia
- West Virginia, West Virginia Geological and Economic Survey, Morgantown
- Wisconsin, Wisconsin Geological and Natural History Survey, Madison 6
- Wyoming, Geological Survey of Wyoming, Laramie