

ILLINOIS STATE GEOLOGICAL SURVEY



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ILLINOIS STATE GEOLOGICAL SURVEY  
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# INDUSTRIAL MINERALS NOTES • No. 21

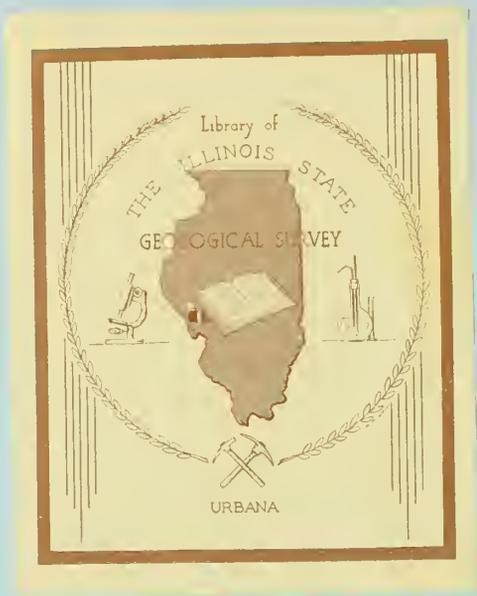
ILLINOIS STATE GEOLOGICAL SURVEY  
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## ILLINOIS NATURAL RESOURCES— AN INDUSTRIAL DEVELOPMENT ASSET

Hubert E. Risser

### A B S T R A C T

Of the materials and energy required for modern industry, minerals provide the major part. Illinois deposits have in the past supplied most of the mineral materials used within the state, and their quantity and variety furnish the basis for strong future growth and development of industry. In order to provide information and service to the public and industry of the state regarding these minerals, the Illinois State Geological Survey is continuously engaged in research on their occurrence, location, quality, and utilization.



## THE ROLE OF MINERALS

Illinois mineral resources contribute in numerous ways to the economy and industrial activity of the state.

The first, most obvious contribution is the total dollar value of raw mineral materials produced each year. With an annual production value in excess of 600 million dollars, Illinois is eighth among the states of the nation. The wide array of minerals contributing to this total includes petroleum, coal, stone and stone products, common sand and gravel, special sands, fluorspar, clay materials, lead, and zinc.

Second is the significance of minerals to the transportation industry. More than half of the freight transported by Illinois railroads and an even larger portion of the barge freight is estimated to be of mineral origin. In 1960, for example, 58 percent of the freight moving on the Illinois Waterway consisted of petroleum, coal, and crushed rock. Eighty percent of the coal produced in Illinois moves by rail, while 90 percent of the crushed stone and 75 percent of the sand and gravel move by truck.

Third, minerals and mineral products provide building materials essential for the construction of the plants, factories, highways, and other facilities required by modern industry.

Fourth, the raw minerals are the basic materials from which numerous other products are manufactured. High quality limestone, for example, is the principal ingredient in cement, silica sand is the basis for glass-making, and Illinois coal is used in the manufacture of coke for blast-furnace operation. Fluorspar is used in the chemical, steel, and ceramic industries.

And fifth, minerals provide a source of inanimate energy, without which industry could not exist.



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An examination of industrial processes shows three key ingredients essential to all types of industrial production. The first essential is man with his capabilities, imagination, and know-how. The second essential is material, which includes metals and nonmetals, water, air, and substances of vegetal and animal origin. Energy is the third, and is used to shape, combine, or otherwise modify the raw materials into useful forms. This energy may be inanimate or animate, but if man is to enjoy more than a bare existence, he must use and control some form of energy far exceeding his own physical capabilities.

Of the material and energy components, minerals provide by far the greatest share, and Illinois possesses many of the minerals required to do the job.

#### ILLINOIS MINERAL RESOURCES

From the standpoint of dollar value of annual production, petroleum heads the list. Seventy-five to 80 million barrels of oil per year are produced in Illinois, with a value of about 225 million dollars. Most of this oil is found in the so-called Illinois Basin, centered in the southeastern part of the state. Illinois oil production since the 1880's has totaled about 2.5 billion barrels, with an estimated value exceeding 5 billion dollars.

In dollar value, coal is the second most important Illinois mineral, and its 1963 production exceeded 51 million tons worth about 200 million dollars. Two-thirds of the state is underlain by coal-bearing rocks, and Illinois possesses the greatest reserves of bituminous coal in the nation — an estimated 137 billion tons. The thick beds of coal, coupled with efficient mining operations, provide Illinois with coal fuel costs that are among the lowest in the nation. About 62 percent of the Illinois



production goes into electric utility use, the strongest and fastest growing market. The 1963 Illinois coal production was the highest since 1951.

Between these two dates, production had dropped as low as 41.8 million tons.

Limestone and dolomite, also economically important Illinois minerals, have an annual value of more than 50 million dollars. The thicker limestone deposits occur principally in western and southern Illinois, but many thinner deposits are worked in other parts of the state. Dolomite is extensively quarried in northern Illinois. Deposits of both of these carbonate rocks also exist elsewhere in the state but are buried to various depths by glacial material or younger rocks.

Plentiful sand and gravel deposits are another economic asset of Illinois. They are mostly of glacial material and are found for the most part in the northern half of the state, particularly in the major valleys where they were deposited by glacial streams. Approximately 40 million dollars worth is produced each year.

Clay deposits and clay-mining operations are widely scattered throughout the state. Annual value of clay products in Illinois is about 55 million dollars.

Other minerals occur at widely separated points. Lead and zinc found in Jo Daviess County at the extreme northwest tip of Illinois were among the first minerals exploited by the Indians of the area. High-purity silica sand, produced in LaSalle and Ogle Counties, is among the finest in the world. Fluorspar is plentiful enough in Pope and Hardin Counties to make Illinois the leading U. S. producer of this mineral.

Smaller quantities of materials such as tripoli, ganister, and natural bonded molding sand also are produced.



## THE ILLINOIS STATE GEOLOGICAL SURVEY

Large quantities of data and information about Illinois mineral resources are available at the Illinois State Geological Survey in Urbana. The Geological Survey, one of three scientific surveys of the state, is responsible for conducting research on the geology of Illinois, including the occurrence, quality, and usefulness of the rock and mineral resources. In cooperation with the U. S. Geological Survey, it is responsible for the detailed mapping of the state's surface topography. It is also concerned with the geological factors in the occurrence of ground water.

Many of the staff specialists are engaged in work of direct interest to industry. The coal geologists, engaged in the detailed study of the nature and extent of Illinois coal resources, provide a ready source of information for the coal industry. Oil and gas geologists and the Survey's library of more than half a million well cuttings and the logs of more than 180,000 drill holes are of assistance to the petroleum industry in its search for oil. Geologists in industrial minerals work are concerned with resources of stone, sand, gravel, and clay, and provide data for those interested in these items. Geological engineers at the Survey study the geology and load-bearing capacity of the earth materials, which are important in the building of dams, foundations, and other structures.

The scientists in our Chemical Group determine the chemical nature, purity, and other characteristics of Illinois minerals. They also are interested in the suitability of these materials for various uses and in potential new uses or new products.

In the Chemical Engineering Section, the use of Illinois coal in the manufacture of metallurgical coke has been under study for several years. Largely as a result of this research, about 1½ million tons of Illinois coal



is now being coked annually by the steel companies of the region. This section is also engaged in studies of the treatment and processing of Illinois minerals and in potential new uses for them.

The Mineral Economics Group is concerned with anything and everything that in any way influences the economic position of the Illinois mineral industry. Its interests include such things as technological changes, general economic or price trends, new processes, new markets, and new mineral discoveries, but its greatest interest lies in seeing an expanded and profitable utilization of our mineral resources.

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