

STATE OF WASHINGTON
ARTHUR B. LANGLIE, GOVERNOR

Department of Conservation and Development
ED DAVIS, Director

FIFTH BIENNIAL REPORT
of the
**DIVISION OF MINES
AND MINING**

For the Period Commencing October 1, 1942,
and Ending September 30, 1944

By
SHELDON L. GLOVER, SUPERVISOR



OLYMPIA
STATE PRINTING PLANT
1944

DIVISION OF MINES AND MINING

SHELDON L. GLOVER
Supervisor

INTRODUCTION

During the past biennium, October 1, 1942 to September 30, 1944, the Division of Mines and Mining has continued to add to its fund of available information on Washington mineral deposits of present and future economic value, to aid in the development of our mineral resources, and to supply industry with information on sources of raw materials. Many of the activities had a more-or-less direct bearing on war needs, as, for example, certain limestone investigations, made when reports were requested on a special low-phosphorous stone; studies initiated on nickel occurrences; and evaluation of iron ores for ship ballasting. Various war-related investigations have continued, but a shift from war needs to plans for postwar development became a marked feature of the requests and inquiries from industrial organizations as the biennium advanced. This has had a direct influence on the activities of the Division, and has indicated the direction that future investigations must take if maximum value is to be obtained from the work carried on.

ECONOMIC IMPORTANCE OF THE MINERAL INDUSTRY

The **direct** money value of the State's mineral industry is indicated by the following table of 1942 production, the most recent year for which statistics are reasonably complete. It should be realized that this is **new wealth**; also that the **indirect** value to the State is in far greater amount than indicated, owing to the economic importance of industries that are dependent on or subsidiary to basic mining.

STATE OF WASHINGTON MINERAL PRODUCTION FOR THE YEAR 1942^①

PRODUCT	Quantity	Value
Clay and clay products.....		\$1,500,000 ^②
Coal.....short tons	1,971,185	7,536,588
Copper.....pounds	16,060,000	1,943,260
Gold.....troy ounces	75,396	2,638,860
Lead.....short tons	4,851	650,034
Lime.....short tons	55,864	623,766
Sand and gravel.....short tons	5,634,676	4,094,900
Silver.....troy ounces	369,038	262,427
Stone.....short tons	1,965,700	1,809,757
Zinc.....short tons	14,398	2,678,028
Miscellaneous ^③		12,000,000 ^③
Total.....		\$35,737,620

^① Statistics in part from published information of the U. S. Bureau of Mines, and Chief Mine Inspector.

^② Estimated from information in files of the Division of Mines and Mining.

^③ Includes portland cement, fluorspar, diatomite, iron ore, magnesite, manganese ore, mercury, strontium minerals, and tungsten ore.

INFORMATION ON MINERALS AND MINING

The Division is called on to provide information on an endless variety of matters pertaining to mining and the mineral industry. Some inquiries may appear trivial, but they are important to the inquirer, as, for instance, questions regarding mineral rights on farm land or what to do when well water

discolors fabrics. Or an inquiry may be of such importance as to justify dropping all other activities and concentrating every facility on providing an answer, as when one phase of the war's aviation program depended on the availability of a few pounds of a vital mineral. The Division's part in this last is indicated in "The Metal that Couldn't be Found," under Report to the Editor, Saturday Evening Post, p. 6, September 2, 1944.

Providing authentic and immediate answers to these voluminous inquiries is one of the most valuable functions of the Division and one that is appreciated by the greatest number of persons. It is partly handled by correspondence, partly in office conferences, and, occasionally in "field" or out-of-office conferences. During the past biennium more than 2,000 items were handled by correspondence. These varied from 52 to 119 and averaged 84 letters per month. Office conferences, generally of greater importance and permitting of more adequate treatment than is possible by correspondence, numbered nearly 1,000; they varied from 18 to 65 and averaged 41 conferences per month.

EXAMINATION OF MINING PROPERTIES AND MINERAL DEPOSITS

A basic activity of the Division is the examination of mineralized areas and of specific mining properties. This is a source of firsthand information on the occurrence of minerals of economic value—information that may have an immediate industrial application or that, on the other hand, may be added to the continually expanding file of similar data for future industrial needs. It enables the Division to keep in touch with the progress of mining development and forms the basis for reports on mining operations and on mineral resources. It also makes possible a personal acquaintance with prospectors and operators whereby their problems can be discussed and, if desired, advice can be given at the property regarding the geology of the ore occurrence and feasible procedures of development and exploitation.

During the past biennium more than 600 field conferences were held, and 456 properties or mineral occurrences were examined in more-or-less detail, depending on the information desired and the amount of time that the investigation warranted.

COAL STUDIES

Coal is one of the State's most valuable mineral resources. Since the first mine was opened some 90 years ago, approximately 140 million tons has been produced, adding close to one-half billion dollars in new wealth to the State. In 1918, 4,128,424 tons, valued at \$14,564,445, was produced; in 1942, another war year, only 1,971,185 tons, valued at \$7,529,926, was produced despite the availability of great coal reserves and a strong market demand.

In an effort to aid the coal-mining industry in every possible way, a mining engineer of long experience in coal-mine operation, both here and in other states, was added to the staff of the Division. All coal operations are visited as occasion arises, and the problems of production and marketing are considered. Meetings are arranged, as in cooperation with the Seattle Chamber of Commerce in June 1944, where conditions adversely affecting the industry are discussed and remedial action planned. Tangible benefits from this work are already being obtained.

COOPERATION WITH OTHER AGENCIES

As in the previous biennium, active cooperation with Federal agencies and with other State agencies was maintained. The Division cooperates with the U. S. Bureau of Mines in the collection of statistics of mineral production; this does not require much time but does involve an annual trip throughout the State in order to prevail on operators who may be delinquent in making returns to supply the data upon which the Minerals Yearbook is based, and also to acquire the names of new producers. The Division has been able to supply the U. S. Geological Survey and Bureau of Mines with information on the location of certain resources—as high-alumina clays—and, on request, has accompanied their representatives on field trips. It is hoped that this has been of service to the Federal agencies in their succeeding detailed studies and exploration programs. In return, the Division has been generously supplied with data obtained by both the U. S. Geological Survey and Bureau of Mines.

It has been possible to supply other Governmental agencies with requested information. Conferences and correspondence of mutual benefit have been held with representatives of the War Production Board, Petroleum Administration for War, Smaller War Plants Corporation, and with Senate Investigative Committees. Also, aid was given the Army in the matter of establishing training camps for personnel engaged in the production of road metal and dimensional stone—this last, incidentally, involving lectures by members of the staff to the trainees.

The Division has the equipment and trained personnel to be of service to State departments who occasionally may deal with matters of geology, mineralogy, or mining. This cooperation is freely offered in the belief that it is more economical and generally advantageous to the State for such matters to be referred to full-time specialists trained in such work than that it be handled by inadequately trained men, or as merely incidental to other activities, or that technical assistance be disregarded or be nonavailable. In line with this policy, aid, on request, has been given to the Highway Department and License Department, and is available to other State agencies.

MINERAL EXHIBIT

A permanent display of commercial minerals is maintained for the benefit of prospectors and to acquaint industrialists with the raw materials that are available in the State. It is not designed as a museum collection, but rather to be a working exhibit of economically valuable materials whose appearance and physical properties are best learned through the actual handling of typical samples. The 200 or so specimens cover the whole field of industrial minerals occurring here. Aside from its general educational value, the collection has proved to be indispensable as a source of illustrative material to be used in conferences regarding the State's resources, particularly in the field of non-metallics.

LABORATORY RESEARCH

The Division is fortunate in having available most of the scientific equipment that is needed to properly carry on the continuing research that necessarily accompanies the field examination of mines, prospects, and newly discovered mineral occurrences. Such work may be minor in amount or it may involve long and painstaking study; it is an integral part of activities and cannot be slighted if useful results are to be obtained.

The facilities were fairly complete, chiefly necessitating the purchase of

reagents and other expendable supplies during the past biennium and the improvising of equipment for the study of ores in polished section. The War Production Board advanced the laboratory's priority rating to AA-1, thus providing for the acquisition of essential materials, but the purchase of a few instruments that are still needed must be postponed until after the war.

MINERAL IDENTIFICATION SERVICE

It is possible to examine, identify, and evaluate minerals and rocks from the State, submitted by prospectors or anyone else who may have need for such service. No laboratory facilities are required that are not already available and in use for regular Divisional activities. This provides valuable information without cost to those who submit the samples, and the Division commonly benefits through the opportunity to learn of new occurrences of mineral substances. In this way, more than 400 samples were examined during the past biennium, and information was supplied on the value and possible utilization of the materials.

PUBLICATIONS

Reports of general interest to the mining industry are published as expeditiously as possible. However, much of the work of the Division is of such nature that publication of the results obtained is not feasible or desirable. For example, the activities coming under the head of individual aid to prospectors and small-mine operators and the work necessitated by increasingly numerous inquiries covering the whole field of mineral occurrences, development, and utilization are originally of limited interest. These activities are handled through personal correspondence and conferences, commonly of confidential nature. They are of basic value to mining and to the general industrial development of the State, but they do not result in specific reports for regular distribution. Other activities are of broader interest and are primarily designed to supply information that can be published. The following reports were distributed during the biennium just past or were prepared and are nearly ready for distribution:

REPORTS OF INVESTIGATIONS

4. Coal and Coal Mining in Washington, by Stephen H. Green.
5. Memorandum Report on Iron Ores of the Cle Elum District, Washington, by Carl Zapffe.
6. Relation of Geology to Mineralization in the Morton Cinnabar District, Lewis County, Washington, by J. H. Mackin.

(Nos. 5 and 6 give the result of investigations made by the Northern Pacific Railway Co., and were made available to the Division of Mines and Mining through the courtesy of that organization and the authors.)

7. Manganese Deposits of the Olympic Peninsula, Washington, by Stephen H. Green. (In preparation.)
8. Geology and Ore Deposits of the Sultan Basin, Washington, by Ward Carithers and A. K. Guard. (In preparation.)

INFORMATION CIRCULARS

8. Directory of Washington Mining Operations, by Ward Carithers.
9. 1944 Directory of Washington Mining Operations, by Stephen H. Green.
10. Geologic factors of quarrying, by Sheldon L. Glover and W. A. G. Bennett.