

MINERAL RESOURCES OF THE UNITED STATES, 1906.

INTRODUCTION.

By DAVID T. DAY and E. W. PARKER.

VOLUME FOR 1906.

This volume contains a statement of the production of mineral substances in the United States during 1906. In addition, it shows the chief features of mining progress during the year.

It is manifestly impossible to present in each volume of this series a historical review of each industry in previous years. Comparisons of present and past conditions constitute, however, one of the most valuable features of a work of this kind; and therefore the statistics of past years are annually repeated in tabular form. To aid comparison the method of presentation is kept as uniform as possible. Thus practically the same form of arrangement has been preserved in all of the twenty-two preceding volumes of the series, and it has become so familiar to the mining fraternity as to render any description unnecessary. But for those to whom this volume comes as a new book of reference it may be explained that the statistics herein contained are not grouped by States. The book is divided into chapters, each of which treats of a separate mining industry for the whole United States. The student who consults this report to find a combined statement of the mineral resources of a given State is referred to the tabular statement of output by States in the summary and to the index, in which under each State is a list of the minerals produced therein. The effort is also made to show the conditions of the domestic industry in relation to foreign conditions in the same mineral industry. This effort to reflect the conditions of each industry extends even to the complicated units of measurement in common use by the industrials. No better argument could be offered for the adoption of the metric system than the discordant units which this report must employ in its reviews.

The fact that this general arrangement has been consistent for twenty-five years makes it easy for the student of any industry to obtain a historical grasp of his subject by consulting all the volumes, which are usually accessible in public libraries.

It is important also for the new reader to know that this volume is simply the consolidation of the separate chapters after they have been published in pamphlet form, frequently months in advance, and that these pamphlet reports and not the final volume mark the dates at which the reviews become available. Further, for greater statistical promptness, the principal figures are given to the public press in advance even of the publication of the chapters in pamphlet form.

Several new names appear in this volume as the responsible authorities in charge of individual chapters. This is in pursuance of the policy announced in the volume for 1905 of assigning all subjects to members of the Survey staff, who in this work and in allied problems are employed solely in the Government service.

The report on iron ores for 1906 was prepared by Mr. Edwin C. Eckel, who in past years has made a special study of the iron ores of the South. The series of iron-ore reports for the United States, however, owes its statistical development entirely to Mr. John Birkinbine, of Philadelphia, who, in addition to being an expert on iron ores, is also one of our chief blast-furnace engineers. Under his direction the statistics of iron-ore production have been developed to an exceptionally high degree of accuracy. This has been due not only to the close scrutiny and careful compilation of the returns, but fundamentally to the great confidence given him by iron-ore producers, among whom Mr. Birkinbine has developed a spirit of fraternity similar to that which Mr. James M. Swank, the general manager of the American Iron and Steel Association, has evoked among the iron and steel manufacturers.

The reviews of the copper, lead, and zinc trades in preceding years have likewise been developed entirely by Mr. Charles Kirchhoff, of the Iron Age, New York. These reports have become classic for their statistical accuracy and for their keen and fair analysis of the trade situation. They were based chiefly upon the returns of smelters, and in developing the method of collecting these statistics into an annual canvass of the mines themselves the charge of these reports has been intrusted to Mr. L. C. Graton for copper and to Mr. J. M. Boutwell for lead and zinc. The smelter returns are still used, and in connection with them it is gratifying to acknowledge the continued and hearty cooperation of Mr. Kirchhoff.

This volume also records the change of the administrative head of the Division of Mining and Mineral Resources from Dr. David T. Day to Mr. Edward W. Parker, Doctor Day taking charge of the reports on petroleum and natural gas. It is not possible for the former to leave the charge of the division without a hearty expression of his obligation to the staff, whose labors he has directed in developing this series. To the three Directors of the Survey who have successively supported and developed this branch of the institution, he offers in return not only appreciative acknowledgment but pride in the established results.

The change of administration includes the placing of the statistics of metal production (except iron ores) under the supervision of Mr. Waldemar Lindgren, who has as chief assistants Mr. Chas. G. Yale, of San Francisco; Mr. Victor C. Heikes, of Salt Lake City; Mr. Chester Naramore, of Denver, and Messrs. Boutwell, Graton, McCaskey, and Siebenthal, of Washington. This arrangement has materially strengthened the work of the division.

As to what may be expected of this work in the future, it must be borne in mind that the collection of statistics for each industry has after continued development reached the stage of a complete census each year, confidential reports being obtained at first hand from the producers themselves—with one exception, that of petroleum, and this exception will be brought to a condition coordinate with that of the other industries at the earliest date possible.

It is designed also to supplement the statistical data with the results of geological and chemical research in so far as they pertain to the economic development of our mineral resources. The Division of Mining and Mineral Resources has been for some years an integral part of the geologic branch of the Survey, this incorporation having been accomplished when the present plan of organization was adopted. The results of this arrangement have been highly satisfactory in that a better system of cooperation with the workers in the other divisions of the geologic branch has been effected. It is proposed to improve and extend this plan of cooperation by taking advantage of the observations made by the men engaged in economic geologic work in the field and in utilizing the services of those who are expert in special lines of investigation. Each volume will therefore not only summarize the statistics of production, but will give all conservative information in regard to both the extent of mineral deposits and the quality and quantity of the useful minerals which they can yield.

It has been found by experience that the proper collection and compilation of mining statistics can best be made under the supervision of technical men, and it is believed and expected that the present arrangement will make the volumes of Mineral Resources of even greater value than heretofore.

SCOPE OF THE SERIES.

By way of review and summary it may be repeated that in the twenty-seven years covered by these twenty-three reports the scope of the work has remained practically the same—an annual review of the mineral production of the United States and of the state of knowledge of the mineral deposits from which the products come. But the work involved has multiplied in two directions. In the beginning the statistical feature of the work was satisfied by an estimate as to the total output of each useful mineral. This estimate was based upon the best commercial estimates available, and the statistical correspondence was limited to a few hundred letters each year. When the control of the work passed into the hands of Doctor Day, he took it with the intention of developing each statistical inquiry from an estimate into an accurate annual census as rapidly as facilities would permit. This result has now been achieved with every industry except petroleum, and to this particular and difficult task he will henceforth limit his work. The correspondence necessary for this annual census of the mines of the United States has grown from a few hundred letters a year to an average of three written or printed communications a year to every known mine operator of the United States—more than 150,000 in all. In order to make such correspondence successful, it has been necessary to send agents to the mines themselves, both for scrutiny of the statistical returns and in order to acquaint the operator with the nature of this inquiry, and thus to secure the cooperation essential to success.

This growth of statistical work would have been necessary even if the mine development had remained stationary. Instead, the rate of increase has been far beyond all reasonable prophecy. In the twenty-seven years from 1880 to 1906, inclusive, the value of the mineral output of the United States has increased nearly five and

one-fourth times. This marvelous growth is of additional interest in that it shows approximately by its fluctuations the financial ebb and flow of the whole country. From \$364,928,298 in 1880 the value rose to \$451,000,000 in 1882, declined to \$406,000,000 in 1884, rose steadily to \$606,000,000 in 1890, declined slightly to \$605,000,000 in 1891, rose to \$622,000,000 in 1892, fell to less than \$550,000,000 in 1893 and 1894, rose to \$640,000,000 in 1895, remained at the same figure in 1896, rose rapidly to \$1,491,000,000 in 1903, declined to \$1,361,000,000 in 1904, rose to \$1,623,000,000 in 1905, and advanced to the immense sum of \$1,902,517,565 in 1906. Keeping pace with this growth has been a strain, and it is gratifying that the system has so expanded that the statistics of this wonderful production continually increase in completeness and accuracy. This attainment is largely the result of the hearty cooperation of the producers, due to their faith in the Survey.

During the last ten years similarly increased facilities have been developed for reviewing in these volumes the conditions of occurrence of mineral deposits by the aid of the general staff of geologists engaged primarily in the making of a geologic map of the United States. The development of this geologic work has been continually in the direction of greater attention to economic geology, and in proportion as it became quantitative in its character it has become available for use and for reference in the volumes of Mineral Resources to their great advantage.

In carrying out the plan of cooperation with the other divisions of the geologic branch a twofold advantage is secured. It brings to the statistical work, on the one hand, a corps of trained men whose field observations have developed a keen appreciation of the geologic and economic importance of each mineral product. This has been particularly illustrated in the reports made by Mr. Lindgren and other mining geologists on gold and silver in the volume for 1905 and the reports on the same subjects and also on copper, lead, zinc, and quicksilver in the present volume. On the other hand, the mining geologists have obtained and will continue to derive from their statistical work an insight into the industrial and commercial conditions which so largely affect the demand for the different minerals and lead to the search for and the development of the mineral deposits with the geological relations of which their field work makes them acquainted.

The bringing together of these two classes of study of our mineral resources, that of their geology and manner of occurrence and that of their statistics and economic conditions, is to be one of the special features of the future work of this division.