

and from peroxy compounds. Since the technological processes depend on the detailed knowledge of the chemical reactions involved these two aspects of the subject are considered in juxtaposition. A large number of synthetic processes have been considered from time to time and these chapters provide a most illuminating account of the wide variety of reactions involved. Subsequent chapters are devoted to the purification, concentration, and handling, and an extensive, accurate and detailed summary is given of the thermodynamic and electrical properties. The structure and architecture of the molecule and the nature of its solutions have always been intriguing problems to the chemist and the account in chapter 6 is clear, very readable and valuable. The discussion of the chemical properties of hydrogen peroxide which occupies the next three chapters is considered under the broad titles: (a) chemical properties, (b) decomposition processes, and (c) stabilization. In each section completeness has been attained by a certain amount of duplication and overlapping of information. The final three chapters deal with the methods of qualitative and quantitative analysis, the use of hydrogen peroxide including bleaching, oxidation, and as a source of energy, and the preparation and properties of inorganic peroxides and super oxides.

The book can be unreservedly recommended to all interested in hydrogen peroxide, whether their interest be fundamental or technological. Portions of the book will also prove of value to those concerned with biology and medicine, catalytic processes and rocket propulsion.

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MINERAL WEALTH OF THE INDIAN SUB-CONTINENT

India's Mineral Wealth

A Guide to the Occurrences and Economics of the Useful Minerals of India, Pakistan and Burma. By Dr. J. Coggin Brown and Dr. A. K. Dey. Third edition. Pp. xxiv + 761 + 8 plates + 12 maps. (London: Oxford University Press, 1955.) 50s. net.

THE last edition of this work was published in 1936 and has for long been out of print. This greatly enlarged third edition comes at an opportune time, when India, Pakistan and Burma are concerned with elaborate plans for industrial development. Since modern industry depends so much on the availability of minerals, an up-to-date appraisal of the mineral wealth of the three countries will prove of value to their Governments, to their industrialists and to their geologists, mining engineers and metallurgists engaged in exploring and exploiting those minerals.

When the first two editions were published, present-day India, Pakistan and Burma formed part of the Indian Empire; and though the original title has been retained, the work is now concerned with the mineral wealth of three independent States, and not with present-day India alone as the title might suggest.

Since the Geological Survey of India was started just over a century ago, a great deal of information has been accumulated and recorded in the various publications of that department, and in the transactions of learned societies. Few of those concerned with mineral development have the opportunity to search these publications for the information they

require. But with this new edition available they can obtain up-to-date information about almost any mineral found in the three countries. This includes a summary of the geology and origin of each mineral, an account of the industry and its economics, statistics of production, analytical data, and maps showing the distribution and geological provenance of the more important minerals. In addition to minerals proper, similar information is also given regarding mineral fuels, building materials, soils and water supplies, the last two having been added to this edition because of the importance of increasing food production to keep pace with a growing population. There is also a valuable bibliography covering every substance dealt with.

No country is completely self-sufficient in minerals. India has adequate supplies of bauxite, coal, iron ore, ilmenite, magnesite, manganese ore, mica, monazite, chromite and gold, but is deficient in ores of copper, lead, silver, tin, zinc and tungsten, and in petroleum and sulphur. Pakistan is poorly provided with most minerals except oil and natural gas, salt, gypsum, chromite and limestone, and at the time of partition little more than 3 per cent of the mineral production of undivided India came from what is now Pakistan. Burma, however, has good supplies of tin, tungsten, lead, zinc and petroleum. Therefore, if the three countries are considered together, as is done in this book, we have a region that is fairly well supplied with the major minerals required in modern industry.

The total value of minerals produced in India has risen enormously during the past few decades. In 1928 the total annual value of minerals raised in India, Pakistan and Burma amounted to about £24 million. To-day the figure for India alone must amount to more than £90 million. Though much of this increase is due to increase in the actual value per unit, there has also been a steady increase in the volume of many of the minerals produced, and new developments during the past few years suggest that the rate of increase will become accelerated. These new developments, as the authors point out, include the discovery of an extensive lignite field in Madras State (where no coal occurs), new oilfields and a great gasfield in West Pakistan, the revival of lead and zinc ore mining in Rajasthan (begun in the fourteenth century but abandoned at the beginning of the last century), the proof of the continuation in depth (without loss of quality) of the manganese ores of Madhya Pradesh, the discovery of emeralds in Rajasthan, the manufacture of ammonium sulphate on a great scale in Bihar (from Indian gypsum), the installation of several oil refineries (for which at present most of the crude oil has to be imported), the processing of uranium and thorium-bearing rare-earth minerals in Travancore, and the proposed great increase in the production of pig iron, steel and ferro-alloys. Perhaps the most important present requirement is an increase in the production of oil, and it is significant that the Government of India is prepared to spend something like £25 million during the next five years on exploration for oil in areas outside those covered by private oil companies.

The book is an up-to-date and accurate survey of the mineral wealth of India, Pakistan and Burma, and it should be in the hands of all those concerned with the development and utilization of that wealth. If criticism is offered, it is with regard to the format of the book, which has now swelled to a thickness out of proportion to its other dimensions.

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