

American figures are swollen by taking the value of the metals and not the value of the ores, but even if the comparison with this country were made upon strictly identical lines, we should still be a long way behind.

In 1901 the United States produced more coal, copper, gold, iron, lead, salt and silver than any other country in the world. The yield of coal was about one-third of the world's supply. This mineral is mined in twenty-eight different States, Pennsylvania being, of course, by far the most important. Twenty-four States are producing iron ore, Minnesota heading the list with 11 million tons of red hæmatite.

Montana yields about two-fifths of the copper of the United States, the Lake Superior district about one-quarter, and Arizona about one-fifth.

Colorado has outstripped California, and is now the leading gold-producing State.

Mr. Oliphant's chapter upon natural gas is sure to claim much attention, and is of special import for those who are interested in our new supply in Sussex. The advantages of this cheap and economical fuel are lauded to the skies by the author, who reckons that the quantity tapped and supplied in 1901 exceeded one cubic mile in volume; 21,848 miles of mains, 2 to 36 inches in diameter, are employed in distributing the gas to consumers.

We learn from Mr. Struthers that the United States are the largest producers of borates in the world. Most of the borax is obtained by treating the colemanite of California.

According to Mr. Joseph Hyde Pratt, who deals with abrasives, artificial corundum is now being employed in the manufacture of emery wheels. It appears that bauxite is converted into corundum by means of great heat and pressure in an electrical furnace. The mineral monazite is far more widely distributed than was imagined when its name was chosen in allusion to its supposed rare occurrence; it derives its commercial value from the small percentage of thorium which it contains. The quantity washed from gravels and sands in North and South Carolina in 1901 amounted to 334 tons.

In dealing with a great work like the volume under review, it may seem ungenerous to point out a small and trifling error, but probably Mr. Birkinbine will be glad to correct the statement that "no true manganese ore is won" in Great Britain. The Merionethshire ore cannot be fairly described as "manganiferous iron ore" when an analysis¹ shows 25 per cent. of manganese and only 4 per cent. of iron.

CLIMATOLOGY.

Handbook of Climatology. Part i. General Climatology. By Dr. Julius Hann. Translated by Robert de Courcy Ward. Pp. xv + 437. (London: Macmillan and Co., Ltd., 1903.) Price 12s. 6d. net.

THE translation into English of the first volume of Dr. Hann's "Climatologie" is a very welcome addition to the library of English-speaking meteorologists. The translation does not extend to the last

¹ Halse, "On the Occurrence of Manganese Ore in the Cambrian Rocks of Merionethshire." (*Proc. N.E. Inst. M. and M. Eng.*, vol. xxxvi. 1887).

two volumes of the original work, which deal with special climatology, as it has been found "impracticable" to translate them. This is greatly to be regretted, for the generalisations which constitute the science of climatology cannot be satisfactorily treated without reference to the statistical data and the means for verifying them. Moreover, a compendious review, in English, of the statistics of the various meteorological elements arranged according to geographical distribution is constantly wanted for many purposes, and either a translation of Dr. Hann's volumes, or a reproduction in an abridged form of Dr. Buchan's volume of the *Challenger* reports, is a necessity of which every student of meteorology must be aware. It is quite true that such a survey would be a work of reference, and would not serve as a text-book in a course of general climatology, and as that is Prof. Ward's purpose in preparing the translation, we must unfortunately wait for some other interest to prompt the translation of the two volumes of special climatology.

The translator himself explains the relation of the English version to Hann's first volume:—

"This translation, as it stands, essentially reproduces the original. Numerous references, especially such as will be most useful to English and American students, have been added, and changes have been made in the text in order to bring the discussion down to date. A natural temptation to expand the original has been yielded to in very few cases only. Practically all of the important publications which have been issued since the completion of the second German edition are referred to. Some new examples of different climatic phenomena have been added, chiefly from the United States. Most of the examples given, however, necessarily still relate to Europe, because the climatology of that continent has been studied more critically than that of any other region. A few cuts have been made where the discussion concerned matters of special interest to European students only."

Among recent works, references to which have been incorporated, Bartholomew's "Atlas" is conspicuous, but the remarkable Russian "Climatological Atlas," published in 1900, is not, although it furnishes a large number of illustrations of climatological principles.

A distinction is drawn by Hann between climatology and meteorology, but when one deals with general climatology it is rather hard to maintain the distinction. In dealing with the analysis of climates into solar, or mathematical climate, and physical climate, with such subdivisions as mountain climate, continental and marine climates, forest climate, and such supplements as mountains as climatic barriers, geological changes of climate and periodic variations of climate, all of which are treated in the book, it is obvious that neither author nor translator would be content with the mere analysis of figures representing these different sections. The mode of classification at once suggests the causes of climate, and the investigation of such causes is practically general meteorology.

It is scarcely necessary to refer to the admirable way in which Dr. Hann arranged his introductory volume to include a survey of all the general facts about climate and its local variations, and to produce a book

which always surprises those who take it up by the fulness of its information and by the interest which it stimulates. There is no specific indication in the present volume as to what parts are derived from the original and what parts are due to Prof. Ward's careful editing; in any case, the result of the collaboration is a most admirable book.

W. N. SHAW.

OUR BOOK SHELF.

The Steam Turbine. By Robert M. Neilson. Second Edition. Pp. xvii + 294. (London: Longmans, Green and Co.) Price 10s. 6d. net.

THE history of the steam turbine previous to the reign of Parsons, whose first patents were applied for in 1884, may be made out from chapters i. and ii. But descriptions of inventions in the language and with the illustrations usual in patent specifications are not quite what is expected from the author of such a book as this. There is an appendix giving the names and dates of all patents relating to steam turbines. The history and construction of the Parsons and the Laval turbines are given at some length, with the results of practical tests for power and consumption of steam, and the reader gets an opportunity of understanding the construction of modified forms which are now, under various names, coming into use. Students are anxious to examine good drawings and descriptions of the details of the Parsons turbine, and it would appear that these are difficult to obtain. The author of this book has given much information and many illustrations somewhat in the style made familiar to us in the engineering newspapers. Much more information is given about the Laval type of turbine. As to the theory of these turbines, the essentially important points seem to be ignored, and yet all the theory of any turbine known to anybody may be given very shortly indeed. There is a particularly interesting point in connection with the Laval turbine to which the author might have directed attention, namely, the exceedingly great speed reached by fluid at the end of an expanding mouthpiece. So far as we know, the reason for this has never been published, and yet any student of the papers of Osborne Reynolds ought to be able to give it readily.

The chapter on the propulsion of ships by turbines is interesting.

On the whole, the book is one that ought to be read by students; it is practically the only book on the subject, but we think that the author has not done so well with his materials as he might have done.

Whittaker's Electrical Engineer's Pocket Book. Edited by Kenelm Edgcumbe. Pp. viii + 456. (London: Whittaker and Co., 1903.) Price 3s. 6d.

THIS little book differs in several respects from the ordinary type of pocket book; it possesses the usual features—a limp cover, round corners, gilt edges, and a weight quite unsuited to the pocket—which serve to characterise the “pocket book,” but in the arrangement of the matter it rather resembles a small encyclopædia. Each branch of electrical engineering is dealt with in a separate section or chapter, which may be read consecutively as if it were a brief treatise on the subject. The method has much to recommend it; the electrical engineer who comes across some problem in a branch with which he is not familiar can turn up the section dealing with that branch and read a summary of the whole subject; numerous references to recent papers will greatly help him in finding the particulars which he wants. There are, of course, also

a number of tables of the constants more generally required. The treatment is not very even; thus whilst generating machinery—dynamoes, alternators, and motors—receives full consideration in 100 pages or more, only four pages are given to electric lamps and lighting, and the information given therein is quite inadequate. The diagrams and illustrations are clearer than those usually to be found in books of this class.

M. S.

Astronomischer Jahresbericht. By Walter F. Wislicenus. Band iv. Pp. xxxii + 648. (Berlin: Georg Reimer, 1903.)

THIS, the fourth issue of this most valuable and useful volume, contains the references and a brief summary of contents of the astronomical literature published last year. The work is of the same high standard as in former years, and casts great credit on the labours of Herr Wislicenus and his joint compilers. This year-book is so well known to astronomers, and has been found so valuable by them, that it is hardly necessary to dwell either on the general arrangement of the subject or on the method of treatment. The main object of the compilers was to make as perfect a record as possible of all the published papers on this subject, yet to keep the book from becoming too bulky. This they have succeeded in doing, in spite of the fact that many of the abstracts of lengthy papers are very complete.

Now that the Royal Society has published the first annual issue of this branch of science (E. Astronomy) in the “International Catalogue of Scientific Literature,” it seems possible that there will scarcely be room for both of these compilations, since the more perfect they become the more closely will they resemble each other. This question, however, the future will no doubt settle. There is, nevertheless, one main difference between them, in that the volume before us summarises the contents of each paper to which reference is made, while that of the “International Catalogue” is restricted to the bare references.

W. J. S. L.

Practical Management of Pure Yeast. By Alfred Jörgensen. Translated by R. Grey. Pp. viii + 60. (London: the *Brewing Trade Review*, 1903.)

THIS useful little work might have received with advantage a title better descriptive of its contents. It contains a condensed account of the biological methods which are employed in the author's well-known laboratory in the pure culture and analysis of alcohol-producing yeasts. According to the preface, the leading purpose of this treatise is to enlighten the so-called practical man in the methods of investigation employed by the zymotechnologist, so that in the future the practical man and the technologist may work together with better understanding at the many important and difficult problems which are encountered in the processes of the fermentation industries. No doubt the little book is well calculated to fulfil its object if only the practical man will read it, and we hope it will be in much demand for this purpose. But whatever may be the success of the book in this direction, it undoubtedly deserves the careful attention of all zymotechnologists, as it indicates the lines on which a well-known investigator of great experience is working with a view to the solution of many interesting and complicated problems in connection with the organisms of fermentation. The last words on the biological methods of analysis and the technical employment of pure cultures of yeast are still a very long way from being spoken, but as an advance towards this end we cordially recommend the work to the attention of all interested in the biological aspect of the fermentation industries.

A. J. B.