Empire Water-Power.

Water-Power in the British Empire. The Reports of the Water-Power Committee of the Conjoint Board of Scientific Societies. Pp. ix+54. (London, Bombay, and Sydney: Constable and Co., Ltd., 1922.) 3*s.* 6*d.* net.

IT is just about twelve months since reference was made to the third and final Report of the Water-Power Committee of the Conjoint Board of Scientific Societies (NATURE, December 8, 1921, p. 457). In the little book before us the whole of the results of the investigations made by the committee, as set forth in the three successive reports, are embodied. This compact statement of the present position of the British Empire in regard to the development of its water-power resources will be welcome to all who are interested in the matter, either from a purely scientific or from a utilitarian and practical point of view. It represents the outcome of four years of valuable research work, carried on with unremitting activity by the committee under the capable direction of the chairman, Sir Dugald Clerk, and with the energetic and painstaking assistance of the secretary, Prof. A. H. Gibson.

Sir Dugald Clerk contributes to the volume a preface of a very thoughtful and stimulating character. He tells us that the 46 million people now living in the United Kingdom require an expenditure of energy of 10½ million horse-power for their support, and that while this supply of power is undoubtedly forthcoming, for the present, from our stock of coal, yet our reserves of natural fuel are bound to diminish, and in time to be depleted, so that we shall be obliged to fall back upon other agencies to make good the deficit. Taking the United Kingdom as a whole, there appears to be continuously available (24 hour period) a total of 1,350,000 horse-power, or if any great tidal scheme, such as that of the Severn, be included, perhaps a total of 1,750,000 horse-power. This is, of course, insufficient to replace the work done by means of coal-fired engines, but, at least, it would represent a very substantial saving in fuel.

On the other hand, this power is not all economically realisable, or rather the cost of obtaining the whole of it would be higher than is justified, as yet. In Scotland, however, some 183,000 horse-power is immediately feasible, at a cost appreciably less than that of coal-fired stations built and operated under existing conditions. Even in England and Wales, a large proportion of the quota is commercially obtainable. It is obviously a matter, then, of national concern to devise means for making use of these natural power supplies, which are running to waste, if only for the purpose of supplementing the work which is at present done by our far from inexhaustible supplies of coal.

The report covers a wider field than Great Britain; it embraces the resources throughout the British Dominions, and its carefully compiled figures will be of considerable assistance to those whose interest lies in the promotion of water-power schemes at home or abroad. BRYSSON CUNNINGHAM.

Our Bookshelf.

Modern Electrical Theory. Supplementary Chapters. Chapter XV.: Series Spectra. By Dr. N. R. Campbell. (Cambridge Physical Series.) Pp. viii+110. (Cambridge: At the University Press, 1921.) 10*s.* 6*d.* net.

THE work now before us is one of the supplementary chapters to Dr. Campbell's book on modern electrical theory. This series of supplements is planned according to an idea which might well be used by the authors of other text-books on physics. It is unfortunate, however, that we are unable to commend the present book to those who, like the reviewer, welcomed the author's original work as a real and vital account of the subject. The book contains numerous errors which any practical spectroscopist would detect at once; and they reach their culminating point when the author, in a professedly complete list of the chemical elements the spectra of which form well-defined series, omits oxygen, sulphur, and selenium. The spectrum of oxygen is, almost in a classical sense, one of the most beautiful and ideal series arrangements known to every spectroscopist. It has not played a part in the application of the quantum theory as yet, which may provide the explanation of the circumstance that the author is unaware of this fact, as he shows more than once.

The genesis of this book is quite clear. The author has read Bohr's recent work on the "Correspondence Principle," and, like every other reader, has been very much attracted by it. He has also consulted all the Danish and German writings, and he gives a really excellent account of them in a very non-technical style. Dr. Campbell appears, however, to be unaware of the contribution of this country to the subject, and of the practical details of spectra. The second deficiency explains why all the facts of spectra which he gives correctly are those which foreign writers have quoted in support of the quantum theory. Following the usual assumption that all the significant work on the subject has been done abroad, anything written in English is mostly ignored or misquoted. It is difficult, indeed, to find an English name in the whole work. A treatise on any branch of this subject which never refers to the fundamental work of Jeans, dismisses that of Fowler with a casual mention of his least important contribution, credits Nicholson with a mere suggestion that the angular momentum in an atom might have discrete values, and finally never mentions W. Wilson, who anticipated Sommerfeld in the fundamental generalisation, while putting it on a