

Radioactivity.

A Manual of Radioactivity. By Dr. George Hevesy and Dr. Fritz Paneth. Translated by Dr. Robert W. Lawson. Pp. xix + 252. (London: Oxford University Press, 1926.) 15s. net.

IN the hands of the translator and the Oxford University Press, the modest, beautifully printed "Lehrbuch der Radioaktivität" of 1923 has become the imposing, beautifully finished, and handsome English edition of 1926; the little German two-seater is now a handsome blue Daimler saloon complete with coat-of-arms on door.

This book is intended as a manual for senior students and young research workers. In size and scope it is not unlike the earlier books of Fajans and of Russell; and like that of the former, but unlike that of the latter, it pays attention more to the physical than to the chemical side of the subject. This to our mind is a pity, because it was on the chemical side of the subject of radioactivity that the authors made their names, and, whereas the physical side can be expounded by many, a fuller informed discussion by the authors of the chemical problems involved would have been invaluable.

For the most part, the English follows the German edition closely, but whereas the latter takes account of the literature up to the beginning of 1922, the former has been considerably modified and extended, particularly in the sections relating to atomic structure, to embody the results of more recent research. Several of the figures in the German text are now reproduced as plates, which, of course, are much clearer. These include the famous one in which the newly-born nucleus of atomic number 8 and mass 17 is seen bending thickly round to the right while the ejected hydrogen particle makes a bee-line to north-west almost in line with the α -particle which begat it.

The book is not fully documented in the ordinary sense, but many references to the literature during the period 1916-1925 are collected in an appendix, and these suffice for the purpose of the work. The first nine chapters deal with the specially physical side of the subject: the theory of disintegration, the constitution of the atom, and the nature of radioactive particles and rays. This is well but much too briefly put, is up-to-date, and is well illustrated. Too much information is packed away in these chapters which, in length, are not much more than sections, and they are made weightier because any looseness of thought or of statement which the authors have allowed themselves in making clear their subject is sternly corrected in their copious footnotes.

In Chap. x. the transformation series are given. In our opinion the authors are unduly conservative in

taking the view that the actinium series arises as a branch from the main uranium series, instead of the more likely view that it derives from a uranium isotope of mass 235 (or 239). In a work of this scope, however, there is little room for a discussion of this point.

Several chapters are devoted to the subject of isotopes, radioactive and non-radioactive, and the possibility of their separation, a subject in which the senior author has done notable work. The three chapters which deal particularly with the chemical side of the work could be enlarged with advantage, since they embody the research work of the authors themselves on such subjects as the chemical behaviour of extremely small concentrations of substances and the use of radio elements as indicators.

A long chapter deals with the various effects of the rays from radium and other radioactive substances, such as their chemical or physiological action or their use in promoting atomic disruption. Few workers are aware how far investigation has penetrated in these regions. Of particular interest at the moment is the work of Lind and his collaborators on the chemical effects of radium rays on liquids and gases. The translator must not, however, call hydrocarbons hydrocarbonates (p. 242), for that may remind chemists of the physicist who in translating a text-book of organic chemistry rendered throughout as *carbohydrate* the German for hydrocarbon. Geologists as well as physicists will find the bearing of radioactivity on geology, and particularly on the age of minerals, ably discussed in Chap. xxvi.

The authors have included a chapter on the historical development of the science of radioactivity. This, we consider, is unnecessary. To the uninitiated the names of all but the greatest of the pioneers convey very little, while those who have borne the burden and heat of the day know that the real history is not that given in any text-book. The translation is very good, and it is quite clear that the translator has contributed considerably to the excellence of the volume. He should, we think, use more extensively the nomenclature of the Chemical Society in rendering chemical terms; for example, *protoactinium* is preferable to *protactinium*, and the name of a chemical element should be written out in the text, the symbol being reserved for chemical equations.

Here then is a book, well-translated, clear, informed, up-to-date, and all too brief, which can be heartily recommended to the student and research worker. May the reviewer, with all respect, give it an affectionate 'pat on the back' in memory of happy days with the senior author in Sir Ernest Rutherford's laboratory in Manchester, in the great days before the War?

A. S. R.