In both this volume and that which preceded it one is constantly aware of the tremendous organizing ability which provided and so successfully staffed the large number of neurosurgical centres in the United States and abroad during the Second World War. This organization went further, however, in uniting the centres into one great team with the experience, therapeutic advances and research findings at one centre being made known to all through bulletins, meetings and the visiting consultants. The advantages of such an organization over that existing at the time in Britain need no emphasis—here, large numbers of neurosurgical (military and civilian) casualties were cared for in civilian hospitals, by neurological surgeons in some, orthopædic surgeons in others, each group working in relative isolation, some with an inadequate staff and without facilities for research or discussion of their problems with other groups interested in the field. While such a state of affairs was of course not invariable, it did exist. Not the least valuable contribution of these volumes from the United States could be the guidance they might provide concerning the organization of war-time neurosurgical services in Britain should the need for this again arise. J. E. A. O'Connell

BERYLLIUM

Beryllium

By G. E. Darwin and Dr. J. H. Buddery. (Metallurgy of the Rarer Metals, No. 7.) Pp. ix+392. (London: Butterworths Scientific Publications, 1960.) 70*s*.

Possessing, as it does, low density, high-elastic modulus, moderate strength and good oxidation resistance, beryllium would be an attractive structural material were it not for its low impact strength and high notch sensitivity. Because of these limitations, beryllium has been important mainly as a minor addition to alloys based on other metals, until the advent of nuclear energy made new demands on the metallurgist and necessitated a re-appraisal of the so-called rarer metals. Because beryllium has low atomic weight and very low absorption cross-section for thermal neutrons, both the metal and its oxide, beryllia, are suitable for use in reactors.

Intensive research and development work in recent years has made possible the use of beryllium for the canning of nuclear fuel elements. Much work had to be done before this stage was reached, however, and the book now under review gives a timely summary of available knowledge. All aspects of the metallurgy of beryllium are discussed including the occurrence of beryllium-bearing minerals; the extraction, production and fabrication of the metal; its physical, mechanical and chemical properties; its alloying behaviour and its nuclear properties. A chapter is devoted to beryllia, another to the "Health Hazards and Their Control" that have complicated recent work on both metal and oxide, and a useful appendix is devoted to the determination of oxygen in beryllium.

A monograph on a single metal is generally expected to refer to every relevant paper of note, and the authors have clearly borne this in mind. References are numerous throughout, frequently with just a short sentence about each paper, and there are occasions when more critical comment would have been welcome. As might be expected, this applies mainly to those parts of the book which are concerned with aspects of the subject outside the authors' personal experience. The sections more directly concerned with the production and fabrication of beryllium for nuclear energy, and with the properties of most direct relevance, are written in a much more authoritative manner, and the volume will be welcomed by all those working in this field.

If only the problem of brittleness could be overcome, beryllium would be of the greatest interest to aircraft designers. Those aeronautical engineers who are already discussing the potentialities of the metal should welcome this comprehensive treatment, and they should find the chapter on the ductility of beryllium of special interest. The book is nicely produced and well illustrated and is a useful addition to metallurgical literature. A. G. Quarrell

RARE-EARTH CHEMISTRY

The Chemistry of Yttrium and Scandium

By Dr. R. C. Vickery. (International Series of Monographs on Inorganic Chemistry, Vol. 2.) Pp. vii+123. (London and New York: Pergamon Press, 1960.) 40*s*. net.

If the purpose of a monograph is to present the reader with a concise, critical and systematically presented résumé of knowledge in a particular field, and to spare him so far as possible the need to refer to the original literature, this book is unsuccessful. Scandium and yttrium are commonly discussed together with the lanthanons, even though in all their properties they display the behaviour expected of elements in Group IIIA of the Periodic Table. It is, in fact, impossible to consider the chemistry of yttrium, in particular, without continual comparisons with rare-earth chemistry, and, except at the level of detail and completeness found in Gmelin's *Handbuch*, it is debatable whether the elements justify a book to themselves.

Following a rather diffuse discussion of the history, natural occurrence and atomic properties of both elements, the author sets out to treat the isolation and the chemistry of each in turn. In matters that touch on Dr. Vickery's extensive practical experience of rare-earth chemistry—the (curiously old-fashioned) treatment of their minerals, the extraction and the analytical chemistry of scandium and yttrium—the reader is overwhelmed with facts and details of procedure. Other chapters that should clearly set out the chemical and physical properties, crystal structures and thermodynamic data for their compounds are sketchy, confusing in arrangement and, in parts, apparently ill digested. Plates, diagrams and textual statements are too often quite uninformative, and the whole lacks a certain coherence. Much of it might have been written thirty years ago, and even such separation procedures as ion exchange receive a disproportionately small allowance of space. On the credit side the author has assembled a considerable (but not a complete) bibliography, though the reader's confidence in the reliability of references may be shaken by other evidence of exceptionally careless proof-reading and preparation of the manuscript. Counting obvious typographic errors, mis-spelt names, omission of units and downright factual blunders, I noted corrections on at least 29 of the 116 pages of text. A purist would want to alter the lamentable English style on many more. The book has a limited usefulness. J. S. Anderson