

citizens of the United States, nearly all its illustrations, verbal and pictorial, are taken from North America and the possessions of the United States, and all the references, with few exceptions, are to American writers. In view of the fact, admitted by the author, that "the future history of America is to be inseparably connected with that of the rest of the world," more attention might have been directed to other countries; for instance, some of the street-scenes in American cities might have yielded to views in European or Asiatic capitals. It is, however, right that geographical study should begin with the home region, and this idea frequently finds expression in the inquiries suggested at the end of each chapter—*e.g.* "Make a careful study of the influence of geographic environment in your own State or locality. What factors are the most important? Are there any national forests in your State? Locate them. Is the Federal Government aiding in road construction in your vicinity?" But other suggestions will broaden the reader's outlook—*e.g.* "How will the economic geography of France be changed by the restoration of Alsace-Lorraine? What made possible the shipping of meat and dairy products from Australia and New Zealand to the British Isles?" These questions cannot be answered from the book itself. He who succeeds in answering them all will have had to read and think much, and will have become a more valuable citizen.

Modern High-speed Influence Machines. By V. E. Johnson. Pp. viii+278. (London: E. and F. N. Spon, Ltd., 1921.) 14s. net.

THE author points out that electrostatic machines are used much more on the Continent and in America than in this country, where they do not appear to be held in good esteem. He proceeds to argue that this bad repute is undeserved, and proceeds to investigate the capabilities of this class of machine and the conditions upon which its efficiency and trustworthiness depend. Practically all the types which have been proposed from time to time are described and analysed, and accounts are given of the author's own experiments, resulting in a type considerably more efficient than the well-known Wimshurst machine. He claims that, as a source of high potential supply, a high-speed influence machine designed on the right lines should be as efficient as an induction coil with all its accessories, and that, principally on account of the continuity of its supply and the higher voltage available, it should give better results for Röntgen-ray work, particularly with tubes for high penetration. Other fields in which he suggests that such machines may prove useful include applications to wireless telegraphy, electro-culture, electro-therapeutics, ignition, and the testing of materials.

Although we find here and there a little looseness of expression and vagueness in quantitative statement, there is evidence of clear thinking in the construction of a consistent theory of the action of these machines from the mass of incomplete explanation

which is diffused among the existing literature on the subject. There is also some thoroughly practical information as to the construction of these machines.

The Transition Spiral and its Introduction to Railway Curves. By A. L. Higgins. Pp. viii+111. (London: Constable and Co., Ltd., 1921.) 6s. net.

THE early part of this book is devoted to a discussion on the principles underlying transition curves. The objects of a transition curve on a railway are to provide a gradual increase in curvature from zero at the point of contact of the curve and the straight part of the line of rails to a curvature equal to that of the central circular portion of the curve, and also to provide for a corresponding increase in the superelevation. Special attention is given to the clothoid (or Glover's spiral) $\lambda = m\sqrt{\phi}$, and the mathematical work required to elucidate this curve is carefully and clearly explained. The conditions which govern the lengths of transition curves are adequately discussed. The engineer may be called upon to insert transition curves in existing lines of railway and also in new lines, and for either purpose he will find the explanations of the procedure given in this book of great service. The latter half of the book is entirely taken up with field exercises fully worked out, which include not only the ordinary problems, but also problems in compound curves and reverse curves. This part is especially valuable, and cannot fail to be of use to railway engineers. We can recommend this book with confidence both to students of surveying and to railway engineers.

The New Hazell Annual and Almanack for the Year 1922. By Dr. T. A. Ingram. Thirty-seventh year of issue. Pp. xlvi+585. (London: Henry Frowde, Hodder and Stoughton, Ltd., 1922.) 5s. net.

THE new volume of Hazell's Annual will receive a cordial welcome from all who have occasion to make use of reference books. It is smaller by about two hundred and thirty pages than the volume issued last year, the sections dealing specifically with the Overseas Dominions and with foreign countries having been omitted, but the omission has enabled the publishers to make a handsome reduction in the price. We also miss several of the interesting surveys of the progress in particular subjects during the previous year which have hitherto been included. Other features of past volumes, such as the calendars, astronomical and meteorological data for the current year, and a compilation of the particulars of societies and institutions, which includes most of the better-known British and foreign learned societies, have been retained. A large amount of educational information which covers the universities, colleges, and secondary schools in the British Isles has also been gathered together. The volume is a valuable book of reference on matters of general interest.