Periodicity of Earthquakes

Studies on the Periodicity of Earthquakes
By Dr. Charles Davison. Pp. ix+107. (London: Thomas Murby and Co., 1938.) 13*s*. 6*d*. net.

"When the earth's crust, or a portion of it, is on the point of making one of those sudden movements that result in earthquakes, a very slight force acting in the same direction may precipitate the movement. On the other hand, the same type of force acting in the opposite direction may be sufficient to delay its occurrence. If the magnitude of the force, in whichever direction it acts, is subject to a periodic variation, as in annual or diurnal changes of barometric pressure, the same, or a contrary, periodic variation may thus be impressed on the frequency of earthquakes in any district. The study of the periodicity of earthquakes may therefore throw light on both small and great movements of the crust . . ."

THESE opening words from the preface of Dr. C. Davison's new book clearly indicate the motive that prompted this veteran worker on earthquakes to undertake one branch of his extensive seismic studies. Much might be written on the mechanical questions involved in these prefatory remarks, without invalidating the legitimacy, in our present state of ignorance, of inquiry into the periodicity of earthquakes. Such an inquiry forms a natural complement to the author's long and valuable work in collecting and cataloguing particulars of the earthquakes that occur both in the British Isles and throughout the world as a whole. His book summarizes and extensively revises (with the aid of many new catalogues) the conclusions on earthquake periodicity that he has published in many articles during the past forty years and more.

The periods Dr. Davison has been led to consider range from forty-two minutes, through diurnal and annual intervals, to eleven and nineteen years; a chapter is devoted to each supposed period. The brief opening chapter describes the method employed, and the test of reality adopted, which is one given by Schuster; the author states that the test may be, and often has been, misapplied, but is himself convinced that as he applies it, it establishes the reality of the periods studied in each of his chapters. In his concluding chapter, he discusses how the results he obtains throw light on the movements of the earth's crust.

Those who know most about the pitfalls that beset statistical studies, not least in geophysics, will probably feel that Dr. Davison's conclusions should be taken as a new starting-point, rather than as the end, of this line of investigation. Not the least valuable feature of his book is the long list of (131) catalogues of earthquakes on which his studies have been based, and which will facilitate new studies of the same data, as, for example, by the methods that Bartels has developed, wherein, in particular, 'quasi-persistence' is taken into account. S. C.

Electronic Theory and Organic Reactions

Modern Theories of Organic Chemistry
By Dr. H. B. Watson. Pp. viii+218. (Oxford: Clarendon Press; London: Oxford University Press, 1937.) 15*s*. net.

A BOOK such as that under review was certainly wanted in order to co-ordinate the various modern theories applied mainly to organic chemical reactions. Thus, after a general article on theories of chemical combination—a theme which has occupied the minds of chemists from the earliest days and will do so for many years to come—the author passes on to deal with the new physical methods of investigation, and devotes many pages thereafter to a general discussion of the subject, mainly of the electronic theory as applied to organic reactions. Although Robert Robinson gave a very concise and clear account of this theory in his lectures at the Institute of Chemistry in 1932, the work which has been done since needed the hand of a ready writer, in order to co-ordinate the details in a manner capable of being understood by those who are not physically minded. The desired co-ordination is provided in this book, and the author is to be congratulated on the way in which he has achieved a most necessary task.

Nevertheless, it must be admitted that except in the instance which may be termed "The Royal Institution Case", the theory has not yet proved sufficiently quantitative to enable it to predict. It still relies too much on what is known and on what, indeed, has been recognized and provided with