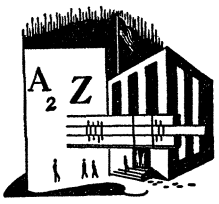
reaction to stimulation which persists as long as stimulus is present and forms a basis upon which habits are developed and modified. Dr. Kluckhohn feels that neglect of these distinctions has caused confusion and that their proper appreciation can materially aid in applying the methods of psychoanalysis, anthropology, and learning theory to a greater understanding or even an occasional prediction of human group behavior.

Unfortunately, culture change seems to involve a ceaseless flux of both internal and external factors, and cultures themselves have a tendency to create just about as many problems for the individual as they solve for him. Society as a whole has certain requirements referable primarily to the group rather than to the biologically derived needs of the individual; this reviewer concurs in the conclusion that in a well-considered plan of social study, culturally created values must be recognized as well as the external and immediately observable environment.

DANA COMAN

Department of the Army



Seismicity of the Earth and Associated Phenomena. B. Gutenberg and C. F. Richter. Princeton, N. J.: Princeton Univ. Press, 1949. 273 pp. $10.00.

The objectives stated by the authors of this text on earthquakes are: to evaluate the present relative seismicity of various parts of the earth and to discuss the geography and geological character of the zones and areas of seismic activity. In fulfilling these objectives the authors give the reader a broad summary of the results of a vast amount of geophysical research, particularly their own. Their subject matter and general presentation will appeal to the reader with a casual interest in earth science as well as to the specialists—geophysicists, geologists, and geographers.

The observational basis of the book is the great mass of data compiled from records of seismograph stations throughout the world. Data are more or less available for all significant earthquakes that have occurred since 1904. The authors have taken these data and (1) located epicenters, (2) determined the depth of focus, and (3) evaluated the magnitudes of hundreds of earthquakes. Their results are presented in 154 pages of tables headed as to depth of focus and geographic region of the earthquakes. These tables provide a convenient reference which should be useful in a variety of studies.

A large proportion of the text is devoted to a discussion of the regional distribution of epicenters and their relations to the larger units of geologic structure. The frequency and energy of earthquakes, the interior of the earth, the mechanics of earthquakes, and tsunamis (seismic sea waves) are treated in smaller sections.

Maps showing the regional distribution of epicenters and active volcanoes are numerous and well placed throughout the text and certainly these maps and the data upon which they are based should serve as a basis for the revision of older ideas which have fulfilled their purpose but often appear in new books on the earth.

In view of the importance of the earthquake magnitude scale and the energy computations made with it, it is unfortunate that the discussion of these subjects had to be so brief in the book. It seems that a few more remarks on these computations would have benefited those readers who will not have immediate access to the articles in the journals. One has the feeling that the exact significance of the energy ratios as determined by the authors may be overlooked by many who will see this work. There are several places in this section of the book where the wording is so concise as to detract from the clarity.

The authors explicitly state their intention "to present facts of observation with only a minimum of hypothesis," and one can note that care has been exercised in this regard. Here and there throughout the book, however, appear several of the authors' conclusions which, although some have previously been stated in scientific journals, will undoubtedly prompt discussion and the review of related evidence. Outstanding in this respect one might note the following conclusions: that the Pacific arcuate structures contain thrust planes which dip towards the continents; that the ground displacements in regions of block faulting are always in the same sense; that small shocks are never sufficiently frequent to approximate the energy released in larger shocks and therefore cannot function as a "safety valve" to delay a great earthquake; and that there is a thin "continental" crust under the Atlantic Ocean.

This is a book which conveys a great deal of factual information on earthquakes and enough of the authors' experienced interpretations to make stimulating reading.

ROSS R. HEINRICH

Saint Louis University

Electron Microscopy: Technique and Applications. Ralph W. G. Wyckoff. New York: Interscience, 1949. 248 pp. $5.00.

During the past five years Dr. Wyckoff and his colleagues at the National Institutes of Health have contributed significantly to the art of electron microscopy, particularly in the use of metal shadow-casting and surface replicas for the preparation of specimens. This nicely written book is a presentation of their results and contains brief descriptions of the methods used to obtain them.

The history, construction, and adjustment of electron microscopes, together with brief but helpful descriptions of various techniques for preparing specimens, take up only 80 pages. The remaining 58 pages of text describe the results—a selection of 175 of Dr. Wyckoff's superb electron micrographs of specimens ranging from metals and tooth structures to viruses and crystals of large molecules. The interpretation of the pictures is usually made independently of x-ray diffraction, sedimentation, or physiological studies of the material, and in some