REVIEWS: THE NATURAL HISTORY OF IGNEOUS ROCKS; EARTHQUAKES

HAMILTON M. JOHNSON
PROFESSOR OF GEOLOGY AND GEOPHYSICS
TULANE UNIVERSITY

THE NATURAL HISTORY OF IGNEOUS ROCKS, by Alfred Harker. Originally published in 1909; republished in facsimile reprint by Hafner Publishing Co., New York, 1965, xv + 384 pp., $10.50

Not much is required in reviewing a book which has been recognized as a "classic" for almost sixty years; Harker was one of the most outstanding British petrologists and this book has been taken as a basis for many subsequent works on the subject.

The author was disturbed that descriptive petrology had received the largest share of specialist attention; so much, in fact, that one purpose of his series of lectures at Cambridge (and thus this book) was to restore igneous action to a definite place in the geologic history of the globe. Contemporary with his work, were developments in physical chemistry which provided lines of systematic treatment and experimental laboratory analysis. As Harker states, "It is therefore our first business to show that igneous activity, standing in close connection with the tectonic development of a region, is very intimately and fundamentally related to other parts of its geological history." To carry out this business, he briefly reviewed igneous action and crustal movements as inter-related phenomena and then discussed the geographical distribution of the younger igneous rocks and cycles of igneous activity. Vulcanicity, igneous intrusions, and petrographical provinces were treated in much the same historical-geographical vein; then we come to the physical-chemical approach and it is here that the depth of treatment of this early book becomes evident. When the author speaks of paragenesis of particular rock types, their actual manner of association in the field, and the order in which associated and presumably consanguineous (odd word in a text on rocks!) types have appeared, we began to see the signs of the chemist.

His discussion of igneous rocks and their constituents, rock magmas, crystallization of rock magmas, supersaturation, isomorphism and mixed crystals, magmatic differentiation, etc., all lead to consideration of an "ideal" system for classification of igneous rocks. The genetic classification which he believed would come as a fuller knowledge of facts and principles developed is not yet here but the history of research leading to it, is fascinating. It is always great fun to read older scientific works, to see how often their authors were right, how seldom wrong . . . and when they were wrong, what steps led them astray. This book will be of value to everyone interested in petrology as a science, its place in historical geology, and the history of developments in petrologic thinking. It should be welcomed by every geologist.

EARTHQUAKES, by Nicholas Hunter Heck. Originally published in 1936; republished in facsimile by Hafner Publishing Co., New York, 1965, xi + 222 pp., $6.50

This "popular" treatment of the subject, long out of print and rare, again is available. Mathematical treatment and highly technical matters are omitted; the purpose is to present a broad, comprehensive picture for the general reader. As the author points out, earthquakes are fascinating because of their unexpectedness and the extensive losses to life and property which so often result. Because of this fascination and interest, often augmented by direct contact with an earthquake or through reading newspaper accounts or seeing the damage on newsreels or television screens, many persons wish to know more about them. This book still satisfies that demand, even though many other such volumes have been produced during the intervening thirty years.

The original (Princeton University Press) edition in my personal library has long been a reference for student civil engineers because of treatment given to "safe construction in earthquake regions." Most nontechnical books in this field gloss over this aspect completely; while it is very sketchy here, this book does suggest that something can be done. It excellently explains, on an intelligent level, intensity scales, instruments, structural regions, etc., while still maintain-

ing the dramatic interest inherent in descriptions of many most destructive quakes of the last century. This book can be recommended honestly by a seismologist to friends in the general public when they ask about an earthquake, why it happened, will it be repeated, and what can be done about it. As such, the publishers have performed a valuable service in reprinting and offering it at a reasonable price.

June 11, 1966