Origin and Evolution of Earth

Principles of Historical Geology

Kent C. Condie • Robert E. Sloan

In this book, plate tectonics is placed at a central position and the history of Earth is considered not only from the more conventional surface approach, but also of Earth as a whole and as a member of the Solar System. Many subjects that we consider an essential part of Earth history and that are often omitted or only covered in a superficial manner in beginning historical geology texts are included to give the student a more in-depth and accurate picture of the complexities of the history of Earth and of life. Among these are the origin and evolution of the crust, mantle, and core as well as the atmosphere and oceans; comparative planetary evolution; a survey of important isotopic dating methods; the study of ancient climates; the origin and evolution of life; and the early history of Earth. New and exciting developments are introduced at appropriate places in the text. Examples are the nature of Earth's oldest rocks, the origin of continents, extraterrestrial impact and mass extinctions of organisms, rates of organic evolution, and recent developments on the origin of humans.

Our approach to historical geology attempts to define a standard core of essential material and to explain relationships between data sets and interpretations. Principles and concepts are more important in an introduction to historical geology than is the history of given region or group of organisms.

Unlike most historical geology textbooks, we assume the student has been exposed to other science courses, at least in high school if not in college. In particular, biology and physical geology are helpful prerequisites to the study of Earth history. Although this approach to historical geology is most suitable for science and engineering majors, we feel it can also be adapted for nonscience majors.

About the Authors

Kent C. Condie is professor of geochemistry at New Mexico Institute of Mining and Technology, where he has taught since 1970. Prior to that time he was at Washington University in St. Louis, MO..His textbook, *Plate Tectonics and Crustal Evolution*, which is widely used in upper division and graduate courses in the Earth Sciences, was first published in 1976 and has gone through four editions, the most recent in 1997. Condie has also written a treatise, *Archean Greenstone Belts* (Elsevier, 1981), and has edited two books, *Proterozoic Crustal Evolution* (Elsevier, 1992) and *Archean Crustal Evolution* (Elsevier, 1994). Condie's research, primarily dealing with the origin and evolution of continents and the early history of Earth, has over the years been sponsored chiefly by the U. S. National Science Foundation. He is author or co-author of over 250 articles published scientific journals.

Robert E. Sloan is retired professor of paleontology at the University of Minnesota in Minneapolis, MN. During his 44 years at the university, he taught historical geology over 150 times to some 18,000 students. His research has focused on identifying examples of theoretical concepts in paleontology, with important contributions on both an Ordovician extinction and the terminal Cretaceous extinction, the evolution and ecology of trilobites, dinosaurs, multituberculate mammals, and the adaptive radiation of placental mammals after the final extinction of dinosaurs. Twice a Distinguished Teaching Professor, he continues his research on dinosaurs, multituberculates, trilobites, and narrow gauge railroads.

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