

MICROMORPHOLOGICAL FEATURES OF SOIL GEOGRAPHY. BY WALTER L. KUBIĚNA. *New Brunswick, N.J.: Rutgers University Press, 1970. 6¼ x 9¼ inches, 255 pages, illustrated. \$30.00.*

In this volume, Professor Walter L. KubiĚna explains his concepts of soil genesis developed during more than forty years of research in comparative soil micromorphology. Dr. KubiĚna's scientific observations of soils, vegetation and environments began during World War I when he found himself in Siberia as a prisoner of war, and ended with his death in December 1970, the year his fourth major book was published. During his career as a pedologist he explored soils from alpine summits to lowland plains in regions from the arctic to the tropics.

The book is developed from a series of lectures given at Rutgers University in New Jersey and Purdue University in Indiana. Major sections explain soil development on limestone and silicate rocks in a variety of environments. Considerable attention is given to the temperate regions where, according to Professor KubiĚna, soils develop in the greatest variety and undergo the greatest number of developmental stages. Attention is also given to soils of arctic and alpine regions, soils of the Mediterranean zone, soils of the ever-humid and alternating humid tropics, and soils of the semi-arid and arid regions of the tropics and subtropics. The book is supplemented with eighty-nine colour plates of soil thin sections photographed through a microscope to illustrate the author's interpretations of soil formation.

A basic concept developed in the book is that monogenetic soils formed from the same parent material in the same habitat and under more or less the same environmental conditions are characterized by distinctive fabrics identifiable through micromorphological analysis. In contrast, however, polygenetic soils formed under different environmental conditions, and possibly in different habitats, exhibit certain micromorphological features inherited from previous periods of soil formation. These features allow the interpretation of environments of the geological past. In this sense, Professor KubiĚna's concept of polygenesis involves more than the impact of changes in climate and vegetation on the genesis of soil at a given location. It may also include several cycles of erosion and sedimentation involving the transportation of fragments of soil fabric to different locations and their incorporation in new soil profiles.

Pedologists concerned with arctic environments will be interested in Professor KubiĚna's concept of loess as a soil representing a relict of an arctic Råmark, the terrestrial raw soil of the arctic desert. Those who have studied red soils derived from limestone will be interested in his concept of limestone as consisting of transported remnants of tropical and subtropical soils that became incorporated with calcium carbonate in warm seas. Earth scientists seeking interpretations of paleosols will be interested in Professor KubiĚna's interpretations of tropical soils including the observation that genuine laterite is easily confused with ironstones of volcanothermic origin or bog iron formation. Geomorphologists will be interested in the discussion of soil formation, erosion and sedimentation in the evolution of the Spanish rañas. In reconstructing the paleopedology of these landforms, Professor KubiĚna demonstrates the significance of erosion cycles in soil genesis underscoring the view that field investigations of the entire cycle of soil development, soil erosion, and the deposition of soil sediments are necessary in interpreting soil genesis.

The influence of man as a factor in determining pathways of soil development is often neglected in texts dealing with soil formation. Professor KubiĚna outlines the significance of man's activities in a number of soil regions. For example, he relates the genesis of extensive areas of infertile, dry and loose soils in central Spain to intensive, soil-destroying grain farming during Roman colonization in this area. In contrast, fertile soils exist on adjacent slopes that were not farmed.

Although Professor KubiĚna is the founder of soil micromorphology, others have added considerably to the nomenclature and interpretation of soil micromorphological features. Professor KubiĚna is skeptical of complex nomenclature, however, in that it may make the understanding of micromorphological features too difficult. Consequently, he chose to discuss soil fabrics in terms of soil types as defined by Dokuchaev in 1879, i.e., global types roughly comparable to Great Soil Groups. In the preface of his book, he apologizes to American readers for not translating his nomenclature of soils into terms used in the United States. As Professor KubiĚna's interpretations are related to soil classification systems recently developed in the United States and Canada, however, reinforcing concepts may emerge. Those who study the book in this light will find interesting relationships.

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