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Comptes rendus

RIEGER, Samuel (1983): ***The genesis and classification of cold soils***, New York, Academic Press, 230 p., 35 fig., 15,5 × 23,5 cm, cartonné, 39\$ can. (distribué par Academic Press of Canada).

This book begins with two introductory chapters: the first discusses the temperature relationships in cold soils, including global distribution, soil temperature regimes, and soil temperature as related to factors such as vegetation cover and organic matter. The second considers the effect of freezing on moisture movement, ice distribution, particle segregation and cryoturbation. In Chapter Three, the author introduces the United States system of soil classification, *Soil Taxonomy*, along with a brief and readable presentation of its philosophy, nomenclature and structure. The next nine chapters deal with six soil orders represented in cold climates. The Inceptisols are treated most intensively; each of four great groups is discussed in a separate chapter. Finally the author examines the classification systems of Canada, the USSR and the FAO, and compares each to *Soil Taxonomy* with an evaluation of their merit.

This book deals with the soils of cold regions almost exclusively from the viewpoint of *Soil Taxonomy*. In order to get the most out of the text the reader needs to have a working knowledge of this system. For those new to *Soil Taxonomy*, Chapter Three gives a clear overview. In contrast to the original, this chapter is easily read and avoids most of the excessive detail and awkward wording that makes *Soil Taxonomy* difficult for the uninitiated to use. If the reader accepts *Soil Taxonomy's* view of soils, then the rest of the book works logically through the different soil orders.

The chapters dealing with a soil order or great group follow a similar pattern. First a brief description of the soils, their properties and setting is presented. This is followed, except in the case of the Entisols, by a detailed explanation of their genesis according to most widely accepted theory. Finally the classification of the soils, down to the sub-group level, is discussed in detail. In those cases where the author feels that *Soil Taxonomy* does not adequately differentiate between soils he suggests new sub-groups or changes in the criteria that would eliminate the problem. Given the open-ended nature of *Soil Tax-*

onomy the suggestions for new sub-groups, along with their differentiating characteristics, is welcomed; the examples given provide a useful model to soil scientists who face problems caused by similar lacunae. The author points out some of the limitations imposed by the classification system; he mentions, for example, the distinction between Cryaquepts and Cryaquents as being unrelated to soil-forming processes. In some cases the presence of permafrost within the control section will result in a change from Entisol to Inceptisol: he feels that this distinction at the order level is somewhat arbitrary.

One of the most valuable aspects of this book is that each topic is dealt with in considerable depth. The author uses experience acquired working with cold soils and an impressive selection of reference material to develop his arguments. For example, in his chapter on the Spodosols he discusses the conditions necessary for their formation, the kinds of organic acids involved, the importance of organometallic complexes on the migration of iron and aluminium, and the "Spodosol process". The identification of spodic horizons in terms of morphological and chemical criteria is also considered in detail. This discussion, introductory to the Spodosol chapter, takes up 15 pages; it would be valuable to any soil scientist interested in these soils, whether in regions of cold or temperate climate. The author's knowledge of reference material is noteworthy; in this particular chapter, for example, there are over 160 citations.

One disappointing aspect appears in the comparison of classification systems; the author has evaluated them for their utility as world systems and not their ability to classify cold soils. Given the specific nature of the book, I would have appreciated the author's opinion on the values of the different approaches to cold soil classification rather than his criticisms of their failure to perform functions they were never intended to perform.

In sum, this book on cold soils is an excellent and up-to-date study. The application of *Soil Taxonomy* to these soils provides a logical means of organizing the mass of information needed to explain their genesis, properties and distribution. Each topic is well researched and presented in a clear and detailed manner through which the value and limitations of *Soil Taxonomy* are underlined. This book will be a welcome addition to the shelves of soil scientists working in cold climates and a val-

uable reference for those working in more temperate regions.

William H. HENDERSHOT