BOOK REVIEWS

Ion Exchange, Vol. I

This volume is the first in a series titled “Advances in Ion Exchange.” Although exchange on mineral surfaces is never mentioned, some of the analogies between exchange on organic resins and mineral surfaces may be close enough to make the volume worth its cost in soil’s libraries.

Roy Caplan discusses transport processes in membranes using the framework of nonequilibrium thermodynamics, and clarifies several points which are directly applicable to flow through soils and clays. F. Helfferich discusses ion-exchange kinetics involving diffusion neutralization, complex formation, and other reactions, some of which are analogous to processes in soils. Y. Marcus discusses the use of ion exchange resins as a tool for studying complex formation and other processes in solution, and outlines methods and needed precautions.

Studies of exchange on long chain amines (liquid ion exchangers) discussed by E. Høegfeldt are related to studies of exchange reactions on soil organic matter and provide some thought-provoking concepts which may be applicable to soil systems. Methods for calculating the ion-water and ion-ion interactions causing ion exchange selectivity are outlined by D. Reichenberg, and he presents a particularly interesting table and discussion of the pertinent energies involved in the association of several anions with tetramethylammonium. R. M. Diamond and D. C. Whitney outline the role of solution concentration in modifying selectivity.

The editor concludes the volume by discussing the utility of polyelectrolytes as simplified systems for studying ion exchange. He also presents equations for the distribution of counter ions (diffuse layer) around rodlike polyions.

In general, the writing is good, and the authors present their material at technical levels within the grasp of most soil scientists. The authors were invited to speculate and the result has been the projection of many basic thought-provoking concepts, which are often more applicable to soil systems than the specific data from which the inferences were drawn.—W. D. KEMPPE, SWC, ARS, USDA, and Agron. Dept., Colo. State Univ., Ft. Collins, Colo.

Système van bodemclassificatie voor Nederland, De hogere niveaus (System of soil classification for the Netherlands. The higher levels)
By H. de Bakker and J. Schelling, 1966. Published by the Center for Agricultural Publications and Documentation at Wageningen, The Netherlands. 170 p. One text and two appendices in Dutch. 32 p. of text in English. FDL 14.50 (approx. $5.25)

The authors describe a system which is the basis of legends for all soil maps of the regular soil survey of the Netherlands. It uses elements of an older Netherlands system along with ideas from foreign systems.

The structure of the four highest categories, i.e., order, subgroup, and subgroup are set out in detail. The influence of pedogenic background and soil-forming processes in selection of criteria for these highest categories is discussed. However, criteria for the three highest categories are based on properties of the soil itself and quantitative definitions are attempted.

Orderly nomenclature for the three highest categories was developed from existing terms, Middle Dutch and artificial terms. Names for classes of the subgroups consist of endings of Dutch toponyms combined with the name of the order. Lower categories of the system are not presented.

For textural classification one triangle is used for aeolian deposits, another for non-aean areas. Organic matter classes are based on a triangle which adjusts for clay content. Lack of A2 horizons in some Podzols and division of Podzols into two classes according to humus form in B are interesting. The influence of man’s activity is recognized in the Dark A1 horizons of the earth soils.

Although the system is admittedly developed for Nederland’s conditions, this book and map give the reader some ideas about soils of the Netherlands and application of a classification to unique situations. Anyone interested in classification of such soils as peat, Podzol or those influenced by man will want this book. The 32-page summary in English presents the main points of the system.—M. E. SPRINGER, University of Tennessee, Knoxville, Tenn.

Movement of Water in Plants

Theoretical and practical aspects of water transport in plants as related to the soil-plant-atmosphere continuum are presented in this text. The thermodynamic concept of the activity of water (Chapter 1) and the flow of water and the factors affecting flow (Chapter 2) comprise the major portions of the book. Topics included in these sections are the free energy of water as characterized by osmotic, pressure, and tension effects; liquid and vapor fluxes, membrane permeability; and temperature and electrical potentials. The movement of water internally in plant cells, tissues, and organs is adequately developed in Chapter 3. However, the sections on water flow into roots (Chapter 4), transpiration (Chapter 5), turgor pressure (Chapter 5), and vapor flux relations (Chapter 6) are treated too briefly, considering the tremendous amount of research work reported in these areas.

The author did not intend for the monograph to be a review; but even so, the bibliographical material is too scant. The author is also too modest in not citing any of his own work in the field of water transport in plants. Nevertheless, the book should be useful supplemental reading for advanced undergraduates and graduate students in plant physiology, soil physics, and agricultural climatology.—F. S. NAKAYAMA, U. S. Water Conservation Laboratory, Phoenix, Ariz.

Carte Pedologique de la France a l'echelle du Millionieme (Pedological Soil Map of France, scale 1:1,000,000).
Published December 1966 by the Institute National de la Recherche Agronomique.

The polychrome map, in two sheets, is the first soils map of France with complete coverage of the country to be published by a French organization. In the late 1940’s or early 1950’s, the Ecole Nationale des Eaux et Forêts initiated a program for publishing a soil map of France, in four sheets, at a scale of 1:1,000,000 or approximately 16 miles to the inch. However, only one sheet, that for northwestern France west of 2° E. and north of approximately 46°30’ N., was published and this in 1951.

Coverage includes Luxemburg, and portions of southern Belgium, southwestern Federal Republic of Germany, western Switzerland, northwestern Italy, northern Spain, and southern England. In this respect, the title of the map “Carte Pedologique de la France,” is somewhat misleading. In my opinion, however, this extension of the coverage across the international boundaries is one of the strong features of the map. It enables one to see the distribution of the soils of France with respect to a larger geographic framework, as well as the soils of the adjoining countries classified in terms of the French soil classification system.

The Carte Pedologique de la France was compiled under the direction of Prof. Jacques Dupuis of the Faculte des Sciences et Pottiers. The compilation for France proper is based on the work of some 29 French soil scientists, and includes the previously mentioned soil map of northwestern France. The non-French portions of the map were compiled from four published soil maps: (1) “Carte des Sols de l’Europe,” at a scale of 1:2,500,000, by the O.A.A. Commission Europeenne de l’Agriculture; (2) “Carte dei Suoli d’Italia,” at 1:1,500,000, by F. Mancini; (3) “Los Grupos principales de suelos de la Espana Peninsular, Mapa Agronomico Nacional,” at 1:1,300,000, by the Ministerio de Agricultura; and (4) “Suelos de la Peninsula Luso-Iberica,” at 1:1,000,000, by H. del Villar.

The two sheets are so constructed that they can be readily

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