

Book reviews

History of Soil Science: International Perspectives by D.H. Yaalon and S. Berkowicz (Editors). Catena Verlag, Reiskirchen, 438 pp., 1997. Hardback. ISBN 1-923381-40-9 (DM 264).

History, compared with soil science, is a subject full of debate because much depends on the personal view of past events. In soil science, as in other sciences that are essentially fact-driven, personal views are minimized. Consequently, much of the written debate is restricted to journal editors and authors, the occasional published letter to the editor, and not forgetting, the discussion papers in this journal.

The systematic study of soils incorporating scientific principles, is less than 150 years old. A systematic study of how soils are being studied is even younger. The historic development in some areas of soil science have been reviewed in journal articles and some textbooks, but it is only since the ISSS Congress of 1982 that a small Working Group was formed dealing with the History, Epistemology, and Sociology of Soil Science. Most of the work in this group is being conducted by eminent and retired soil scientists, but little by historians of science.

The first book solely dedicated to the history of soil science was written by I.A. Krupenikov and appeared in 1971. It was written in Russian but an English translation (*History of Soil Science — From its Interception to the Present*) was made available in 1993. Although this book contains many interesting sections on the Russian contributions to soil science, there is some imbalance in treatment where it concerns efforts in other nations. That imbalance has not been a wide issue of debate in soil science. In 1989, J. Boulaire published a book on the history of pedology and soil science but the book is available in French only and has therefore perhaps not received sufficient attention. The current book contains 22 papers in English of 27 authors from all parts of the world. The book covers a wide array of subjects which are rather loosely grouped into 5 parts: (i) Introducing soils as an object of study, (ii) Classification and mapping of soils, (iii) Selected topics in chemical and physical soil sciences, (iv) Some regional perspectives and concepts, and, (v) Some outstanding personalities. In short, there are papers on the development of soil science, papers on different countries, and biographical sketches of soil scientists.

The book starts with an introduction on the developments of concepts in soil science and it includes a brief discussion on the changes in agricultural chemistry, soil physics, pedology, humus, and soil biology. This is followed by chapters on humus, soil horizon designations, and an interesting chapter on the first International Conference on Agrogeology held in Budapest in 1909. Together with the conferences held in Stockholm in 1910, Prague in 1922, and Rome in 1924 when the ISSS was established, these conferences were the predecessors of the ISSS congresses held every four years since 1927. Historical developments in soil mapping and classification in the USA and UK are covered in the second part together with a chapter on the first soil maps of Europe and the US land capability classification. Some specific soil chemical and physical properties are being treated in the fourth part, like soil pH, soil mineralogy, and soil physical developments in Central and Eastern Europe. Some interesting regional perspectives and concepts are discussed for Germany, the former Soviet Union, India, Australia, and New Zealand. The book ends with six papers on some outstanding personalities but perhaps less well known contributors to soil science like E. Pontoppidan, G.M. Murgoci, L.S. Berg, J.H. Ellis, and R.V. Ruhe. One chapter is devoted to the soil microbiologist S.A. Waksman who is the only soil scientist to have won a Nobel Prize. This was in 1952 for the discovery of the antibiotic streptomycin.

Most of the book is concerned with the period 1840–1960. Very little information is given on earlier views on the soil or about recent trends in soil science. One thing that becomes evident from the book is that at its inception soil science had a strong national character causing slow acceptance of new ideas. This in particular concerns Dokuchaev's ideas on the soil which was for him a variable and independent body of nature like plants and animals. He laid down many of his ideas on soils and the way that they were formed in his thesis (*Russkii Chernozem*) in 1883. His ideas although the basis for our current thinking on pedology, were very slowly accepted. One would like to know whether this was unique to soil science or that the slow dissemination of scientific principles and practices took also place in other disciplines.

Developments in soil science in tropical regions lagged some decades behind the temperate regions, but the history of soil science in tropical regions receives virtually no attention in the book. For example, the works of G. Milne and P. Vageler in East Africa, F. Hardy in the West Indies, J.W. Leather in India, A. Matthei in Chili as well as E.C.J. Mohr in the Dutch East Indies remain unmentioned. Clearly, there is lots of work remaining. Besides these omissions, there are a few other shortcomings. Firstly, the book is mainly written by soil scientists and intended for other soil scientists. Non-soil scientists interested in the subject may find it hard to read because there is little synthesis of the various chapters, no glossary, and no detailed explanations of various soil scientific subjects. Cross-referencing between the individual chapters is also absent. To our view, an index of subjects and persons would have increased its value.

Roy Simonson stated in his contribution about the early days of soil survey: that what was required had to be learned. The same may apply to such a young study as the History of Soil Science. The book is, however, a very important addition to the few publications on this subject and most papers should be regarded as essential reading for many of the 50,000 or so soil scientists in the world.

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PII: S0016-7061(98)00038-X

A Colour Guide to Paleosols by G.J. Retallack; John Wiley, New York, 1997, 1 vol. 217 × 28 cm, 175 pp., 144 photos, 46 fig., 32 tab., Price: £34.95 or \$60.

This guide complements the textbook, *Soils of the Past: An Introduction to Paleopedology* published by G. Retallack in 1990. It is designed as an introduction to paleopedology for geologists. G. Retallack aims to cover the whole history of soils from the very beginning with an emphasis on pre-Quaternary paleosols of which he is a renowned specialist. The core of this guide, not tied to the text, consists of magnificent colour photographs. For each of them, both informative basic data and interpretations are given in the caption. The selection of images is designed for browsing, so as to convey an impression of the variety of paleosols and some features critical to their interpretations. The medium of colour, according to G. Retallack, conveys a good part of the paleosol message about ecosystems and environments of the past. Photographs are organised into four categories. The first regroups at all scales features critical for recognition of paleosols, such as traces of soil biota, horizons, pedological features and birefringence fabrics, the second presents varied examples of paleosol formation such as paleosols in floodplains, in coal measures while in the third, examples of classified paleosols are given and in the fourth, cases of burial alterations of paleosols such as compaction, clay recrystallisation are presented. The text consists of four chapters, recognition of paleosols, diagenesis of paleosols after burial, interpretation of paleosols and methods in paleopedology. A wide, well selected, multidisciplinary list of references is produced. This list is followed by an informative, easy to read glossary and an index.

G. Retallack writes on page 113 “*the paleopedology is fundamentally a field science*” and a few sentences later “*Sit, muse and converse with your paleosols*”. These two sentences summarise G. Retallack’s approach of paleosols.

Such an approach was probably true in the earlier stages of this discipline, however most of the recent achievements in paleopedology are based on lab results. No analytical strategy is proposed for investigating paleosols. Analytical methods are just described, some in very detail while others are just quoted, e.g., isotopic ones. A section on paleosol dating is missing. A large space is devoted to soil micromorphology. 35 micrographs are produced and the procedure for manufacturing paleosol thin sections and the main Brewer's concepts and terminology are given, whereas the possibilities of soil micromorphology for deciphering paleosols are not discussed.

The paleosols are considered in this guide as some kind of a black box, i.e., a systematic inventory of features, fabrics and other characters is not proposed. Consequently only some leading soil forming processes are examined while the establishment of a hierarchy between features and fabrics for reconstructing sequences of pedo-sedimentary events is not envisaged. In addition such a partial view of paleosols leads to subsidiary various short cuts. Thus, soils are here considered to have a time related linear development, e.g. a progressive accretion of carbonate in calcrete, which leads to the derived assumptions that soils do not register climatic fluctuations and consequently paleosols are weak paleoclimatic indicators. Recent publications have however abundantly reactualised our conception of soil sensitivity to environmental variables promoting soils and paleosols as a major source of proxy dates for documenting the regional complexity of global changes. An another consequence of such an approach is an absence of discussion on time scales in soil development. The last consequence of such a partial analysis is the ignorance of erosional and sedimentary features common in paleosols which leads to minimise the role of sedimentary petrography when investigating paleosols. Common concepts in paleopedology such as pedo-sediments, pedo-complexes are in consequence not discussed. Naming and classifying paleosols are open to controversy because most of paleosols have no modern analogs. G. Retallack takes the easiest way, naming and classifying paleosols according to the Soil Taxonomy.

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