

## **A. A. J. de 'Sigmond's System of Soil Classification**

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A. A. J. DE 'SIGMOND displayed his activity in different fields of soil science, and some of the results he achieved are still widely known, and serve as a basis for further research. His soil classification system belongs those scientific achievements of his that have aroused interest both in his lifetime and these days.

This system, the first one relying upon the principles of genetics, has an outstanding importance in the history of soil classification. It is universal, i.e. it provides a classification framework for all the soil types of the world, yet, at the same time, it is accurate and detailed. It is accurate and detailed in so far as it comprises all the soil types ever described, and groups them on the whole range of two taxonomic degrees into higher units, i.e. divides them into sub-types, varieties, etc. No genetic classification system had been formulated before this with similar integrity.

'SIGMOND published his system in 1932, in the "Mathematics and Natural Science Journal", under the title: "General taxonomy of the soils developed on the surface of our earth". He discussed this subject in every detail in his book: "Principles of Soil Science" published in English in 1938.

In formulating his system 'SIGMOND made use of the results which had been achieved in the field of soil taxonomy. He adopted the basic principles as well as the attitude from the classification systems of DOKUCHAEV and his followers, SIBIRTZEY, GLINKA, GEDROIZ and VILENSKY. 'SIGMOND not only adopted the principles of genetics but he also succeeded in spreading them among other soil scientists.

He also adopted the views of the American followers of the Russian genetic trend (MARBUT, COFFEY, RISE) saying that classification should be based upon actually recognizable and measurable soil properties, and not upon the spatial changes of soil forming — primarily climatic — factors.

Accordingly, he eliminated the application of the climatic-zone criterion in his classification system even in the cautious form used by RAMANN or HILGARD.

'SIGMOND qualified his system as "dynamic", meaning — among other things — that he considered the typical soil forming processes as factors in the grouping of soil types. In this respect 'SIGMOND was very much influenced by STEBUTT's taxonomy, he applied some of its elements in his own system.

'SIGMOND and GEDROIZ carried on important research work simultaneously but — for a long time — unaware of each-other's activity and achieve-

ments in establishing soil colloidics as a new branch of soil science and in investigating the regularities of cation adsorption and cation exchange. As a result of this activity it has become well-known that the composition of cations adsorbed on soil colloids is in close connection with the soil forming processes. This is why both of them attributed great diagnostic importance to the composition of adsorbed cations; what is more, they chose it as the basis for separating higher taxonomic units.

It is impossible to take into account all the factors that influenced 'SIGMOND in formulating his soil classification system. One thing, however, can be unambiguously stated, namely, that he established it in full knowledge of the scientific results achieved till then, i.e. he made use of all data and material he deemed to be up-to-date. Nevertheless, his system is entirely original, and free from eclecticism.

The taxonomy formulated by 'SIGMOND classified soils — known at that time — on 8 taxonomic levels: main groups, sub-groups, soil orders, main types, sub-types, local varieties, physical and physiologic classes.

'SIGMOND distinguished 3 main groups of soils: organic soils, organic-mineral soils, purely mineral soils. This most general classification is correct even in the light of our present conceptions, since it follows from the conceptual definition considered now the most up-to-date: The soil is a formation produced by the major geological, and the minor, biological cycles of substances, as well as by their interaction.

The origin of soils, i.e. to which of the main groups they belong, depended on whether the biotic-, or abiotic factors were prevailing at a given place. Within the main group of organic soils 'SIGMOND distinguished raw-, and humified organic soils; the main group of purely mineral soils was subdivided into raw, purely mineral soils, purely mineral soils with initial weathering and purely mineral soils encrusted with some end-products (salts) of mineral weathering. Within the main group of organic-mineral soils the differentiation of sub-groups was made according to the types of decomposition (raw soils of mixed origin; humo-siallitic soils; ferric-siallitic soils; allitic soils) and the same principles were applied in the division of the raw soils of mixed origin as well as of the allitic soils, into soil orders (endodynamic, ectodynamic, pseudodynamic soils, resp. pure allites, siallitic-allites, and bauxitic allites). To the sub-group of humo-siallites belong those soil orders which can be characterized by means of similar cation composition (H-soils, Ca-soils, Na-soils), whereas the sub-group of ferric-siallites includes soil orders of identical genetic marks (brown earth, red earth, yellow earth).

The 4th taxonomic unit, — main types, — grouped genetically related soil types according to similar profile-structure, origin and geographical situation. The 5th unit (sub-types) represented the most important part of the classification system. 'SIGMOND enumerated and defined the known soil types on the strength of descriptions retraceable in technical literature. He described even the local varieties of the well-known, thoroughly studied soil types, whereas in the case of others he omitted further division into sub-types, for lack of sufficient data.

He provided the basic principles for the classification of local varieties according to their physical properties and nutrient supply, pointing out the correlations between these properties and the genetics and dynamics of soils.

The general soil taxonomy of 'SIGMOND aroused keen interest all over the world, and the response of Hungarian experts was also favourable. 'SIGMOND did not prepare soil maps, but the marked scientific influence of his system is shown by the fact that even L. KREYBIG, otherwise averse to the genetic method of classification, in his methodology for general soil maps on the scale of 1 : 25 000, specified that the genetic soil types should be marked with a number corresponding to 'SIGMOND's system of taxonomy.

Since the times of 'SIGMOND, no attempt has been made in Hungary to establish a classification system comprising all the soils occurring in the world. In the last decades, owing to the enormous progress made in the scientific description of the soil cover of the world, such a quantity of data has been amassed that no single scientist could develop a unified system providing a suitable framework for all sorts of soils. Only international research teams could cope with this task. The co-ordination of national classification systems of fundamentally different conceptions can be achieved only step by step and by many a compromise.