

Activity of the Subcommission on Salt Affected Soils of the International Society of Soil Science

The first important meeting organized on a world-wide scale of soil scientists was the First International Conference on Agrogeology held in Budapest (Hungary) in 1909. It is actually since that time that there exists a successful, international co-operation in the various fields of soil science and agrogeology constantly stimulating their development and yielding outstanding results. In the early years the meetings were organized as agrogeological conferences and held simultaneously with the International Congresses on Geology (for instance the 2nd International Conference on Agrogeology, Stockholm, 1911) although the most eminent soil scientists — among others the outstanding representatives of Russian soil science based on the principles of ДОКУЧАЕВ — participated in them.

Step by step, however, the outlines of an international organization of soil science took shape in scientific as well as organizational aspects. For example already at the Stockholm Congress a subcommittee on chemical soil analyses was established. This subcommittee headed by 'SIGMOND (Hungary) published a journal of its own (Internationale Mitteilungen für Bodenkunde) and held separate meetings.

According to plans the 3rd International Conference on Agrogeology should have been held in Russia, 1914, but it had to be cancelled because of the First World War. On the initiative of HISSINK (The Netherlands), КОРЕЦЗКЫ (Czechoslovakia) and SCHUCHT (Germany) the representatives of soil science met in Prague (Czechoslovakia) in 1922.

In May 1924 the 4th International Conference on Agrogeology (Rome) adopted a resolution signifying a milestone in the progress of soil science, viz. the foundation of the International Soil Science Society. J. G. LIPMAN (USA) was elected President and D. J. HISSINK Vice-President and Secretary General of the Society. The special commissions established at the Prague Conference were reorganized to

cover the various fields of soil science. 'SIGMOND (Hungary) was elected President of Commission II (Soil Chemistry).

It is characteristic of the intense scientific activity of Commission II that its first meeting was held in Groningen (The Netherlands) as early as in April 1926. First of all soil acidity and questions connected with the adsorption complex of the soil were on the agenda of the Meeting convened in order to make co-ordinated preparations for the 1st International Congress of Soil Science planned for 1927. The necessity of establishing an international body dealing with the specific problems of salt affected soils was more and more recognized. One of the resolutions adopted by the 1st Congress of Soil Science (Washington June 1927) satisfied this demand by establishing the Alkali Subcommission. The following soil scientists served as members of the first Board of the Subcommission:

President: A. A. J. 'SIGMOND (Budapest, Hungary)

Vice-Presidents: W. P. KELLEY (Riverside, California, USA)

N. A. DIMO (Taskent, USSR)

B. AARNIO (Helsinki, Finland)

Secretaries: S. ARANY (Debrecen, Hungary)

A. F. JOSEPH (Khartoum, Sudan—later Rothamsted, United Kingdom)

E. E. THOMAS, (Riverside, California, USA)

First, the activity of the Alkali Subcommission was focused on collecting literature on saline and alkali soils and on appraising the work done in this field so far and, at the same time, preparations were made to organize the first international conference of the Subcommission.

The joint Conference of Commission II (Soil Chemistry) and the Alkali Subcommission of the International Soil Science Society was held in Budapest, Hungary, from 1 to 6 July 1929. The Conference presided by 'SIGMOND constituted an important step forward not only in the field of research concerned with salt affected soils, it intensified the development of

other branches of soil science (soil physics, colloid chemistry of soil, soil chemistry, soil genetics, etc.) as well.

The programme of the Conference included reports on the genetics ('SIGMOND), the mapping (BALLENEGGER), laboratory analyses (DI GLÉRIA), the amelioration and utilization (ARANY) and the microbiological properties (TELEGDY-KOVÁCS) of salt affected soils as well as a report on the salt affected soils of Spain (DEL VILLAR). Most of the world's best known experts in this field attended the Conference and the reports were followed by thorough discussions during both the sessions and the subsequent study tours. The participants also received the bibliography — listing 757 publications — of salt affected soils compiled by 'SIGMOND and ARANY.

The Alkali Subcommittee played an active part also at the 2nd (Leningrad, 1930) and the 3rd International Congresses of Soil Science (Oxford, 1935). In Oxford 'SIGMOND was nominated Honorary Member of the International Soil Science Society and Honorary President of Commission II.

The Alkali Subcommittee held meetings (jointly with Commission II) to discuss extensively the various problems of research work on salt affected soils (Copenhagen, 1933; Helsinki, 1938). Two very important problems, the classification of saline and alkali soils and the amelioration and the irrigation of these soils were on the agenda of the Helsinki Meeting. The participants also discussed the morphological, physical and chemical characterization of the various types as well as the problems of the laboratory analyses of saline and alkali soils.

The Alkali Subcommittee served not only as a forum where the aims, results and problems of research work carried on in different parts of the world could be discussed, it actually organized and co-ordinated the investigations in its field. This was mostly due to the remarkable faculties of 'SIGMOND. After his death the activity of the Subcommittee became less and less intense and during the Second World War it practically came to an end.

After the Second World War the agriculture of numerous countries in every continent was confronted with the ever increasing problem of saline and alkali soils. The rapid growth of the population has accentuated the absolute necessity of utilizing and ameliorating salt affected soils, especially in the developing countries of the arid and semiarid zones. At the same time, with the increase of the irrigated area, the danger of secondary salinization and

alkalinization has become more and more grave. In many countries it seriously hampered — or even made impossible — agricultural production in vast areas. Thus, the research on saline and alkali soils has had to deal with problems ever increasing in number and in seriousness which can be solved successfully only through wide and well-organized international co-operation.

Although the scientific activity of the experts working in this field was incessant and outstanding, the absence of a co-ordinating body slowed down progress in many respects. During the successive International Congresses of Soil Science (Amsterdam, 1950; Leopoldville, 1954; Paris, 1956; Madison, 1960; Bucharest, 1964) the new results concerning the investigation, utilization and amelioration of salt affected soils were presented and discussed in the various Commissions, mainly in Commissions VI (Soil Technology), V (Soil Genetics and Mapping), I (Soil Physics) and II (Soil Chemistry). Realizing the disadvantages of this distribution of the subject among above-mentioned commissions as well as the special importance of research work in this field, the 8th International Congress of Soil Science (Bucharest, 1964) approved of the re-activation of the Alkali Subcommittee. Its new name: Subcommittee on Salt Affected Soils signifies not only a terminological difference, a more precise phrasing but the widening of the sphere of the Subcommittee's activities as well.

I. SZABOLCS, Director of the Research Institute of Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, Head of the Department of Salt Affected Soils was elected Chairman of the Subcommittee.

The main aim of the Subcommittee has been to activate all the countries, institutions and experts concerned to carry on co-ordinated research work to solve the most urgent problems of worldwide interest. In close co-operation not only with the International Society of Soil Science and the other Commissions but also with greater international organizations such as UNESCO and FAO, the Subcommittee earnestly strives to intensify and to co-ordinate the efforts made all over the world for the utilization and amelioration of salt affected soils for the benefit of mankind.

The Members of the Board of the Subcommittee held their first meeting in Budapest, Hungary, from 2 to 6 October 1967. The representatives of the International Society of Soil Science, UNESCO

and FAO also attended the meeting. Present were:

Prof. Dr. G. AUBERT, Director of Soil Department, O. R. S. T. O. M., Paris, France

Prof. Dr. F. A. VAN BAREN, Secretary General of ISSS, Amsterdam, The Netherlands

J. H. V. VAN BAREN, Technical Officer, World Soil Resources Office, FAO, Rome, Italy

Dr. C. A. BOWER, Director, U.S. Salinity Laboratory, Riverside, California, USA

Prof. Dr. V. V. EGOROV, Director, Dokuchaev Soil Science Institute, Moscow, USSR

Prof. Dr. M. M. ELGABALY, University of Alexandria, Alexandria, UAR

Dr. S. EVTSEV, Programme Specialist, Natural Resources Research Division, Department of Advancement of Science, UNESCO, Paris, France

Dr. S. V. GOVINDA RAJAN, Head of Soil Survey Division, Indian Agricultural Research Institute, New Delhi, India

Prof. Dr. V. A. KOVDA, Academician, Lomonosov University, Moscow, USSR

Dr. J. K. M. SKENE, Senior Soils Officer, Department of Agriculture, Melbourne, Victoria, Australia

Dr. I. SZABOLCS, Chairman of the Subcommission, Director of the Research Institute of Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, Budapest, Hungary

The principal aim of the Board Meeting was to outline and to discuss the future tasks of the Subcommission. From among these tasks the preparation of a world map of salt affected soils is of primary importance because this map would serve as a basis of international co-operation and co-ordination in the research on the utilization and amelioration of these soils. This subject was the most important item on the Meeting's agenda. The participants, sometimes expressing conflicting opinions, thoroughly discussed the related problems of methodology, soil genetics, soil classification and utilization.

The most important resolutions of the Meeting are as follows:

1. The construction of a map indicating the global distribution of salt affected soils is of pressing importance. This map would be a logical extension of the FAO/UNESCO Soil Map of the World Project, emphasizing the specific problems of salt affected soils for their better understanding on a global scale. The Meeting proposes to the Director General of UNESCO that measures be taken in support of the continuation of this project and to invite the

Director General of FAO to accept joint responsibility.

2. In order to promote the implementation of the project, the Meeting nominated regional co-ordinators who are to prepare the salt affected soils map of the area for which they accepted responsibility. The regions and the responsible co-ordinators are as follows: Africa: G. AUBERT, Australia: J. K. SKENE, Europe: I. SZABOLCS, Middle East: M. ELGABALY, North and Central America: C. BOWER, South East Asia: S. V. GOVINDA RAJAN, USSR, Central Asia and Far East: V. V. EGOROV. Data relating to South America may be obtained in the World Soil Resources Office of FAO.

3. The World Map of Salt Affected Soils is to be prepared on a 1 : 2 500 000 or a 1 : 5 000 000 scale, according to the following mapping units:

A. *Saline soils*. Soils dominated by chlorides and sulphates belong to this class.

B. *Alkali soils*. Soils dominated by exchangeable sodium and/or by sodium bicarbonate and/or sodium carbonate belong to this class which is subdivided in two sub-classes:

a) soils without structural B horizon

b) soils with structural B horizon

In addition to the above, potentially salt affected soils should be indicated on the maps whenever possible.

The Meeting agreed that the proportion of salt affected soils within the areas delineated on the soil maps should be shown as follows: less than 20% of the area is affected, 20–50% and over 50%.

4. The Meeting appointed the Research Institute of Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences to serve as the centre of the co-ordination and construction of the World Map of Salt Affected Soils under the direction of I. SZABOLCS.

5. C. A. BOWER and I. SZABOLCS were requested to prepare a general report on the basic characteristics of salt affected soils, on the methods of field (episodic and dynamic) and laboratory (physical, chemical and mineralogical) studies and on the presentation and the interpretation of the obtained data.

The Meeting decided that technical working groups will be established to deal with the most important problems, and that the experts of the countries concerned will participate in them.

The first meeting of the European Working Group was convened by the Subcommission in Novi Sad, Yugoslavia, on May 21–24, 1968, to discuss the problems

that arose during the preparatory work for the European Salt Affected Soils Map and to prescribe the next tasks. The experts of the interested European countries attended the Meeting and F. A. VAN BAREN, Secretary General of ISSS, was also present.

Two items were on the agenda of the Meeting:

1. Construction of the Salt Affected Soils Map of Europe
2. Recommendation for a co-ordinated, European solonetz reclamation program.

The report introducing the discussion on the first item was presented by I. SZABOLCS. It evaluated the results obtained so far and reviewed the practical experiences accumulated during the preparation of the first draft of the maps. The representatives of Bulgaria, Czechoslovakia, Hungary, Italy, Portugal, Romania, Spain and Yugoslavia presented the first draft maps of their countries. On the basis of these maps it could be seen that in the majority of European countries concerned the basic material is available for the construction of the Salt Affected Soils Map of Europe on a 1 : 2 500 000 scale.

The Meeting discussed the methods and criteria of determining potential salinization and alkalization and in the resolution it emphasized the necessity of indicating potential salinization and alkalization on the maps.

The discussion on the second item of the agenda and the motion adopted in connection with it were also of far-reaching importance.

In his main report, GH. SANDU, Head of the Department of Soil Science and Melioration of the Agricultural Research Institute (Bucharest, Romania) summarized the most important results obtained in the Central and Eastern European countries in connection with the amelioration and utilization of salt affected soils. After-

wards the other experts completed the report with their own experiences and disclosed the results achieved either by themselves or by their colleagues in their countries.

On the basis of the reports and the discussion it was clear that international co-operation would be highly desirable in the field of solonetz reclamation and that internal co-operation should also be developed within the countries concerned. It became apparent that from the wide range of subjects connected with the amelioration and utilization of salt affected soils, first of all two questions, drainage and water economy and the selection of the optimum dose of the most suitable amendments sustain the primary interest. The participants mostly shared concurring views concerning the necessity of proper drainage but their opinions noticeably differed in the other question (the selection of the most suitable amendments, the determination of their optimum doses).

The Meeting decided to set up an international working group whose main task will be the organization and international co-ordination of research work on the application of different doses of amendments in a complex amelioration of solonetz soils under dry and irrigated farming conditions. GH. SANDU was elected Chairman of the Working Group.

The Meeting was concluded with the reports of Yugoslavian experts, and was followed by a two-day professional excursion.

The Subcommission is organizing a symposium on the "Reclamation and Utilization of Soils of High Sodium Carbonate Content" under the auspices of the Ministry of Agriculture of the USSR and the Armenian Institute of Soil Science and Agricultural Chemistry in Erevan, Armenian SSR, on 26—31 May 1969.

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