

'Sigmund, the Professor

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In the history of a University those professors are remembered as great teachers, who educated the young generation to become dedicated scientists, willing and able to fight for the honour and credit of their science, and who founded a school for scientific research.

These are the criteria met — in all respects — by A. A. J. DE 'SIGMOND. It was the group of his disciples who laid the foundation of modern Hungarian food industry and soil science. His students both at the Technical University of Budapest, and in the Association of Engineers and Architects not only identified themselves with the stimulating ideas of 'SIGMOND impressed upon their mind but also carried the majority of these ideas into effect.

In his days, 'SIGMOND was a very good and impressive pedagogue. His noble individuality, absolute sense of justice, his worship for science, his fight for the appreciation of engineering work fascinated many of his students; his modest attitude, preciseness, his readiness to fight bravely for justice and truth, in a word: his human character made even more friends for him. He was liked and respected very much by his students who were attracted first by his noble, human character and then came to appreciate his outstanding mental capacity. First of all it was his exemplary conduct what he used to educate his students. This exemplary conduct was not only theoretic or passive but in his lectures he pointed out the moral side of problems as well. 'SIGMOND was not only a man maintaining his integrity but — if needed — he pressed his students to assume the same attitude, and requested honesty from them in every line of their activities. His care for his students was of high educative effect, too. Talks with him often resulted in the student's joining in the research activities carried on in the laboratory. Valuable work done, some new results, secured the immediate support of professor 'SIGMOND for the student: it was either scholarship in a foreign country, a proper job, or, maybe later, a suitable progress in his line. Thus he educated his students to become willing to struggle for the credit of the profession: gratefulness felt for the professor obliged them to strive to fulfill their commitments in all fields of life.

'SIGMOND let several capable chemical engineers join him in his research work on food industry and nourishment biology. He founded three major and numerous minor research establishments, taking part in the direction of the work there so to say every day. Even when confined to a sanatorium due to a severe disease he continued to care for these laboratories; his collaborators were summoned to see him, to report on their work and to avail themselves of his counsel on problems, failures, on the best way to achieve progress. He not only gave general direction but entered into the most minute details, in research methodics as well as in the practical use of instruments. This attitude

and working style proved to be of a lasting effect on his disciples: even nowadays a certain unified directive, the "SIGMOND-line", in approaching problems, a strive for objectivity characterise researchers coming from this school.

Though both the Technical University and the Institutes organised by him had food chemistry as the main subject, he also established schools not belonging to his proper field. In spite of adverse opinions at the time, he put great emphasis on teaching soil science and agricultural chemistry. It was in these fields, precisely that he established the most lasting communities of disciples. These two branches of science were pursued by him much more intensively than the technology of agricultural chemistry. No wonder then that he acquired world fame in this domaine and from among his disciples the ones working along this line are the best known.

'SIGMOND, the classic Hungarian pedologist [4] became an internationally renowned pedologist. Not only had he schools at home, but in the Chemical Commission of the International Society of Soil Science and in the Alkali Sub-commission of the same he directed the debates as chairman until his death. With his able chairmanship he impressed pedologists all over the world [1, 3, 7].

As director of an agro-industrial factory, 'SIGMOND qualified for a doctor's degree of Arts and Sciences in 1898. In 1899 S. CSERHÁTI took the gifted chemist to Magyaróvár, to the Agricultural Experiment Station.

Professor CSERHÁTI was an expert lecturer in soil science and crop production and at the same time an outstanding researcher in agriculture. He had an overall knowledge of literature, a sharp eye for questions of plant cultivation and agricultural chemistry needing an urgent solution. He also had a good sense for field research work and recognized the need to promote agricultural chemistry in the research of plant cultivation problems, never separating his pedagogical work from research and research organization. CSERHÁTI's spiritual legacy left unmistakable traces on 'SIGMOND's style of work both in research on plant cultivation, agricultural chemistry, and in his pedagogical activities organically tied to his everyday work.

In 1905 'SIGMOND published 15 research reports as well as an approximately equal number of comprehensive studies which, complementing his book "Agricultural Chemistry" published in 1904, caught the attention of the country's leading scientists [1, 5].

In 1905 the Council of the Technical University — with the approval of its supreme authorities — appointed 'SIGMOND professor at the Faculty of Chemical Engineering, a post he kept until his death. He made study tours first in various countries of Western Europe and then in the U.S.A. with the purpose of getting acquainted with the work of the most famous university institutes of the world. Having returned home, he organised the Technological Department of Agricultural Chemistry. In 1908 he set up his Institute what became the centre of Hungarian agricultural chemists and soil researchers throughout his lifetime. For a great number of his students the building still revives vividly past memories of studies and his figure. The chair meant more to him than the Hungarian Central Institute of Chemistry of which he was director, or any professional organization in which he played a leading role [2].

As a professor 'SIGMOND always introduced his lectures by talking about the notion of soil science and its development, later turning to the notion of the soil itself. After this he discussed genetics on the basis of world-literature but keeping by and large to DOKUCHAEV, who had discussed the roles of natural

vegetation, animals and micro-organisms in their biological effects, separately. The methodical and detailed discussion of the role of humus in soil formation — for the first time — meant a *definit novum* [7]. This was followed by lectures describing various types of soils. He started from tests on the spot, discussed soil-physics, soil-chemistry and soil-biology, examining soil as a separate biological formation, considering it neither living nor unliving but rather something in between lithosphere and biosphere. He always examined this field of science in consideration of the needs of agricultural crops and summed up his lectures by picturing soil as a source of nutrients and water for plants.

Then, he came to an essential part of his lectures: soil system. After reviewing the history of soil classification and stressing the advantages of the DOKUCHAEV-school involving genetics and soil-geography, he demonstrated his own soil classification. This had something in common with the GEDROIZ and STEBUTT system, but contained basically new ideas. It covered all the soils of the Earth in one logical system, grouping them in taxonomic units. He established the main groups on the basis of soil forming rock and organic material content, the subgroups by the character of decay, the soil orders by the character of chemical dynamics and the main types on the basis of soil-genetic and soil-geographic indices. The subtypes, local variations, physical kinds of soil and nutritive materials served to establish a division of soils in lower taxonomic units. All these are numbered in a logical sequence. Thus e.g. if a soil is marked 3, 2, 4, 1, it indicates a soil belonging to the third soil sort of the second subgroup of the fourth main group in main type No. 1. For the sake of simplicity the soil's classification is marked by figures, in a fourfold approximation. An even more exact identification of the soil is possible by eight index numbers marking the lower taxonomic units as well. KOVDA and MURATOVA [4] emphasize that the 'SIGMOND classification, at least in its technic, is still applied, although the system as a whole has become obsolete: the soil-chemical characteristics now prevail over the genetic ones. It should be added that today's American world-classification, the "Seventh Approximation" is built on some similar principles although having a totally different basis.

To finish his lectures, he gave interesting demonstrations on theoretical soil survey-technique still used by STEFANOVITS [6] in the genetical mapping of our country, as well as by the National Institute for Agricultural Quality Testing (OMMI) in its soil surveys. 'SIGMOND's lectures on Agricultural Chemistry also sustained great interest. In his introduction he evaluated the role of chemistry in agricultural production. Then, he spoke about the general regularity in nutrient uptake of cultivated plants. Even now his former students recall, how dramatically he exposed the dangers in changing human environment and altering the process of assimilation.

Having explained the biological circulation of carbon, 'SIGMOND took up the plant growing relations of soil chemistry. He dealt with the amelioration of salt affected and acid soils, the nutrient economy of the soil, and the determination of assimilable phosphoric acid. The latter was his first and his very last research theme; he had published his results as early as in 1900 and wrote about it in 1938. He used diluted nitric acid to extract the available phosphoric acid, following the SCHLOESING-method, but had his own one to evaluate the results. In case of higher alkalinity he set higher limit values.

His real territory was phosphorous fertilization; he acquired much experience both in field work and with culture vessels and performed soil chemical

tests. To supply the plants with other nutrient elements he used farmyard manure, a rather reasonable approach in his days. He ended his lecture series in speaking about the connection of soil respiration and carbon dioxide nourishment. His lectures were given for students studying chemistry at the University of Sciences as well as in the facultative form of Agricultural Chemistry.

'SIGMOND's lectures attracted "full houses" although he was not what is called "a good speaker": his voice was rather weak, especially, when he was growing old. Without having any concrete defect in speech he had a strange way of pronouncing some sounds and this needed getting used to. What, then, made the lecture-hall crowded? Surely, the audience recognized his greatness, the lectures amounted to an event. He could talk about the soil cultivation of American farmers, of the irrigation methods of Egyptian peasants by making the audience feel to be on the spot. He had a good sense of logics, he was always ready to prop up his own experiences with the proper citations from world literature.

He was much liked and highly respected by the students and the young specialists in his laboratories. He had an active role in the cafeteria-commission to supervise services. The laboratories in the basement were filled with young researchers who were not only taught and educated by him but also cared for in the form of scholarships. At the time of unemployment affecting university graduates, a monthly 80 Pengő scholarship ensured survival. It was 'SIGMOND too, who helped soil researchers to get proper jobs in their particular field of activity. 'SIGMOND was fond of disputing with his students and colleagues, liked them to have a well-based opinion and readily yielded to valid arguments. He presented the papers of his colleagues at the Academy of Sciences. He was always ready to help his former students in presenting their results at the Society of Natural Sciences or at the Union of Hungarian Chemists, and to comment on their work.

He worked from 8 in the morning till 8 in the evening, possessing unbelievable energy up to his last day; he died at the age of 65. The number of his publications amounts to 346. 'SIGMOND's knowledge has not disappeared with his death; he passed on his spiritual legacy to his successors through his disciples. His scientific results, his wise instructions and the example of his life and activities are with us inspiring for the fulfilment of today's tasks in Hungarian agriculture, even now, 35 years after his passing away.

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