

## Fiftieth anniversary of scientific activity of professor Karol Starmach — honorary member of the Polish Botanical Society



Professor Karol Starmach started a series of algological publications in 1962 when his paper "Some rather rare *Rhodophyta* in the Wejcherowo region in Pomerania and in the Magurian Beskid" appeared in the report no. 61 of the Physiographic Commission of the Polish Academy of Sciences — hence this anniversary of his research work and the present article. This grand jubilee of prof. Karol Starmach is closely connected with the development of hydrobiology and algology in Poland.

Karol Starmach was born in Mszana Dolna near Limanowa on Sept. 22, 1900. He finished school in Myślenice in 1921, but in the meantime he served as volunteer in the army from November 1918 to September 1919. He studied at the Jagellonian University in the period 1921—1925 at the Faculty of Philosophy, specializing in natural science, particularly in botany. At the same time he passed a course of physical education. After graduation he became assistant at the Department of Botany of the Faculty of Agriculture at the Jagiellonian University and also taught biology in high schools in Cracow. At the Department of Botany, in the laboratory of prof. Kazimierz Rouppert, Karol Starmach started to study algology, specializing in *Cyano-* and *Rhodophyta*. It should be stressed that from the Department of Botany of prof. Rouppert there emanated an atmosphere encouraging research in various fields of botany and specialization. Thus for instance the future profes-

sors: Jan Zabłocki specialized in paleobotany, Kazimierz Mieczyski — in plant breeding, Kazimierz Piech — in plant cytology and embryology, Kazimierz Górski — in plant physiology and two ladies — Bolesława Kawecka and Wanda Zabłocka in mycology. Karol Starmach chose algology and became a specialist in *Cyano-* and *Rhodophyta*. He received the degree of doctor of philosophy in the field of botany in 1927. In the period 1928—1939 he was secretary of the Physiographic Commission of the Polish Academy of Sciences. In 1935 he was appointed adjunct in the Department of Ichthyology and Fisheries where he was the right hand of professor T. Spiczakow. There exhibited a high organizational talent — he initiated new laboratories and reorganized the existing ones as well as an experimental Fishery Station in Mydlniki. At the same time he supplemented his studies in other fields of natural science such as: hydrochemistry, zoology of invertebrates, ichthyology and fishery management. Karol Starmach brought these studies closer to the branches of science dealing with practical problems of hydrobiology and fishery management in which he was intensively active for several years. In 1938 Karol Starmach prepared his habilitation dissertation from the field of hydrobiology. He lectured on this subject for several years for students specializing in fishery management. In this field prof. Starmach conducted research work on the influence of the different water environments on the development of aquatic plants and animals. These investigations were connected with the more and more frequent cases of river contamination and protection of the water environment, plants and animals from destruction. Prof. Starmach devoted much time to the development of rapid methods of analysis for detecting water contamination and evaluation of its degree, problems of high importance not only scientific but practical.

At the beginning of World War II (November 1939) prof. Starmach was arrested with other university professors and deported to the concentration camps of Sachsenhausen and further Dachau where he remained for more than a year.

After his return to Cracow he took an active part in clandestine teaching of Jagiellonian University students. He also devoted much of his time to work in the clandestine Regional Office of Education and Culture where he was referee for matters of professional training.

After the war for two years prof. Starmach was chief of the Department of Ichthyology and Fishery Management. He obtained for the University the experimental fish-farm at Zator, where on the ponds hydrobiological and ichthyobiological experiments could be performed. Other experimental work was carried on by the Department under the guidance of prof. Starmach at the Experimental Station in Mydlniki. In 1951 he organized a representation of the Institute of Inland Fisheries in Cra-

cow and he headed it's works until 1954. In the period 1954—1965 he organized in Cracow a Department of Water Biology of which he was chief for 11 years. In the same period prof. Starmach organized another scientific institution — the Department of Algology at the Institute of Botany of the Polish Academy of Sciences in Cracow.

At the Faculty of Sanitary Engineering of the Silesian Technical University in Gliwice he organized in the period 1951—1957 a Department of Sanitary Biology where he lectured arriving regularly from Cracow.

Among other important organizational work of prof. Karol Starmach should be mentioned his initiative in the foundation, also under his guidance, of a new Department of Water Biology of the Polish Academy of Sciences in Cracow in the period 1954—1965. In this establishment interesting scientific problems were solved on the basis of experiments on fishery ponds in the Experimental Stations Ochaby and Goczałkowice. The research work comprised Carpathian torrents and rivers, particularly the upper reach of the Vistula with its confluent.

In 1956 Karol Starmach received the title of assistant professor at the Faculty of Biology and Science of the Earth of the Jagiellonian University and was appointed chief of the new scientific-didactic establishment — the Department of Hydrobiology where he continued his work for the subsequent years. Here prof. Starmach undertook the solution of hydrobiological problems concerning above all the water courses and water bodies of the Tatra mountains.

Numerous problems elaborated by prof. Starmach concerned economic hydrobiology closely linked with fisheries, particularly carp rearing ponds. Elaboration of a biological characteristic of these water bodies led no doubt to the intensification of fish production in the so far poorly developed fisheries of southern Poland. Professor Starmach sees the future of the fisheries in the southern districts in the production of breeding material and fry for rivers and retention reservoirs where waste waters and regulation processes frequently interfere with natural spawning grounds of fish and their development, on account of the changes occurring in the quality and quantity of aquatic organisms which formerly constituted the sole food of fish. The initiative of hydrobiological and ichthyological elaboration of the Carpathian water bodies and rivers is the merit of prof. Starmach. He also supplied with his collaborators material to the periodical "Acta Hydrobiologica" of which he was editor for more than 12 years.

Notwithstanding so many organizational tasks, didactic and social duties, prof. Starmach, owing to his indefatigable industriousness and initiative prepared and published numerous valuable scientific works from fields associated with water biology and linking research problems with practical ones such as water contamination, methods of measurement of the degree and character of this pollutions and the forms and methods

of its elimination. The protection of waters and their purification by technological and biological methods is at present the most timely problem in environment management, and prof. Starmach in his investigations of long standing had this particularly in view. The works of prof. Starmach concern a wide scope of hydrobiological sciences as for instance: microbiology of waters, hydrobiology, ichthyology, sanitary hydrobiology, algology, protection of biocenoses of aquatic organisms etc. Numerous of his studies, and some of the most important, may be classified to algology, systematics and taxonomy, ecology, phytogeography concerning various groups of algae. Professor Karol Starmach is considered by Polish and foreign specialists as the most prominent Polish algologist and a world-wide specialist as regards certain groups of algae. Of his publications over the 50 years of his scientific activity 155 published in various specialistic journals, among them in strictly scientific ones about 60 papers, concern algae. Prof. Starmach is the initiator of the periodical "Flora słodkowodna Polski" (Fresh-Water Flora of Poland) and the editor and author of 5 volumes out of 14 volumes of this series.

All these papers, and above all the latter publication gave world hydrobiology and algology the opportunity to appreciate the value and importance of prof. Starmach's work. Three years ago he was awarded on the motion of the Section of Biological Sciences of the Polish Academy of Sciences the 1st class State Award. The Polish Botanical Society elected him honorary member, he is also an active member of other learned societies such as: hydrobiological, limnological, natural sciences of M. Copernicus and others.

In the period of his intensive didactic and educational activity prof. Starmach lectured for students of various specialities, but above all at the Faculties of Biology and Science of the Earth and the Faculty of Agriculture of the Jagiellonian University. At present the Faculty of Agriculture has become the Agricultural University in Cracow.

In the laboratories headed by prof. Starmach 94 students have received the master's degree (specialization), 32 have prepared their doctor's theses and received their degrees and 6 have received the title of doctor habilitatus, that is prepared and defended their habilitation dissertations. Former students of prof. Starmach have prepared and published in the Department of Water Biology under his guidance 214 research papers and 140 articles popularising science. In the Department of hydrobiology 59 scientific papers were published and 32 articles and in the Laboratory of Algology 12 research papers and 4 chapters in the 5 volumes of "Fresh-Water Flora of Poland".

The publications of prof. Karol Starmach include 14 manuals, above all of algology, in which he elaborated the following groups: *Mastigophora*, *Cyanophyta*, *Rhodophyta*, *Diatoma*, *Chrysomonadales* ... and others,

an outline of hydrobiology, inland waters, methods of plankton investigation etc., from the field of ichthyology — the life of some fresh-water fish, rearing of pond fish etc.

Prof. Starmach collaborated with the Faculties of Civil Engineering of the Technical Universities, particularly of Sanitary Engineering on which he lectured for students of this faculty and for whom he wrote two interesting manuals "Zarys hydrologii sanitarnej" (An outline of sanitary hydrology) and "Biologia sanitarna" (Sanitary biology) in which he expressed the modern views on the utilization and protection of waters, which have influenced the correct understanding of the problems of technical sanitary hydrobiology.

Professor Karol Starmach took an active part in the proceedings of several learned societies in Poland. He is the founder and honorary member of the Polish Hydrobiological Society, for many years he has been a member of the Polish Botanical Society which for his merits in the field of algology has given him the title of honorary member. Prof Starmach is also active in several Committees of the Polish Academy of Sciences: the Committee on Botany, on Hydrobiology, on Zootechnics. He is also member of the Biological Commission of the Cracow Division of the Polish Academy of Sciences. He has played an important role as chairman of the Committee for Management of Mountain Areas of the Polish Academy of Sciences in the period 1960—1969. He was the initiator and organizer of the Department of Mountain Areas Management of the Polish Academy of Sciences in 1964 and he took part in the publication of 18 issues of "Problemy Zagospodarowania Ziem Górskich" (Problems of Management of Mountain Areas). Prof. Starmach is chairman or member of the boards in the scientific councils of the Institute of Inland Fisheries and the Department of Water Biology of the Polish Academy of Sciences (PAS), the Institute of Botany (PAS), the Department of Nature Protection (PAS), the Institute of Water Management (PAS), the Research Department of the Upper Silesian Industrial District (PAS), the Section of Ichthyology of the Scientific Council attached to the Ministry of Agriculture. He is also a member of the International Society of Limnologists. He has been invited to collaboration with the International Research Group on *Cyanophyta* as an eminent specialist. In the period 1957—1969 he travelled as visiting professor to various congresses and symposia in Austria, Czechoslovakia, Switzerland and the USSR.

All that is mentioned here on the activity and achievements of prof. Starmach is only a brief outline; each field of his activity should be elaborated separately: strict research work, organizational activity, scientific studies on the border of practical applications, didactic-educational and professional-social proceedings. Only then would the quality and quantity of the work he achieved up to his 50-years jubilee be truly visualized.

In reviewing the documentation it is hard to believe that one man could have managed to do all this. Prof. Karol Starmach has received many distinctions and awards for his work. The Golden Badge of Merit of the Silesian Technical University, the Award of the Minister of Sciences, Academic Education and Technology and in 1972 for his algological work he received the 1st class State Award.

Professor Karol Starmach continues his work, let us hope that his energy and health will allow him to effectively further promote Polish science.

*Prof. dr Tadeusz Gorczyński*

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