

PROF. DR. AMBRUS ÁBRAHÁM
(1893—1989)

I took leave of him as his former student and colleague at his dying bed. Only his eyes were talking, gazing quietly to a great distance. Perhaps, this was the last time, they were seeking the secret of life. Then we sadly read:

THE HUNGARIAN ACADEMY OF SCIENCES, THE JÓZSEF ATTILA
UNIVERSITY SZEGED let you know with deep sorrow, that
AMBRUS ÁBRAHÁM

the member of the Hungarian Academy of Sciences, emeritus professor of the József Attila University Szeged, honorary president of the Hungarian Biological Society, outer member of Royal Society (London), member of the Indian Academy of Zoology (Agra), member of Szeged Academic Board, member of the Scientific Educational Society, member of the Editorial Board of *Zeitschrift für mikroskopisch-anatomische Forschung*, honorary doctor of the József Attila University, winner of the golden order of Labour, the KOSSUTH-prize and the flag order of the People's Republic Hungary died in loth of January 1989 in the 96th year of his life.

We lost in his personality a scientist with exceptional knowledge and international fame, an outstanding representative of comparative zoology, neurohistology, and neuromorphology.

I see his vivid face just like many many times before, just like I keep it in my mind together with many others. We begin to remember him with this picture writing down what an outstanding personality he was.

He was born in 20th of November, 1893 in Tusnád, Csik county, Transsylvania. He was the 7th child of a well-to-do peasant family with 10 children. His birthplace is situated at the foot of the mountain Hargita; a valley with stream-cut meadows, grasslands, plough-lands. It is surrounded from three sides by Tusnád stream. The forest with wolves and bears is very near. "The beautiful forest is the spot of dreams, desires, unimaginable joys and painful memories." Memories which followed him when he was meditating here in Szeged beyond the river Tisza, at the Maros riverside; he was listening the message of Transylvanian land. He lead a Transylvanian way of living, especially in his work. In his home he was writing, preparing for lectures until dawn. The nights were very short, the days full of very hard work. Just like in the family home, where the adolescent child made hay in a competition with his father. He used to work from early morning till late in the evening. He was trained in this way by his birthplace and plenty of work.

When he was eleven, he attended the secondary schools in Csiksomlyó and Csikszereda. During this time he was fond of collecting and classification of insects.

After his eminent GCE he had to decide in the choice of profession. He had the idea of financial and intellectual independence from home, to find the way to the science, and he tried to answer the questions of "from where?", "why?" and "where?". These last questions were his strongest motivations. In 1913 he applies for admission in the Premontre order, in Jászó. This decision brought him more

doubts than satisfaction. So, besides theology he turned to biology and he became the student of PÁZMÁNY PÉTER University Budapest. His subjects were natural history and geography.

He spent most of his time in the Institut of General Zoology and Comparative Anatomy and Histology. He prepared his competition essay on the reproduction of Infusoria living in *Amphibia* in this institut. His capability, exact, enthusiastic work, was recognized by the director of the institut, LAJOS MÉHELY, who appointed him to assistant lecturer in 1917. He was then graduated as secondary school teacher of biology and geography in 1919. At the same time, because of conscience, he finished his theological studies too. This period was very difficult. But the poor lodging, starving, the suffer from cold could not brake his enthusiasm for his work. He teaches zoology at the Teacher's Training College of English Ladies, at the same time he gives lectures in both of the divided Department of Zoology. He is the leader of histological practicum too. This latter was the greatest experience for him. He became a genuine comparative histologist here, learning and teaching at the same time.

MÉHELY was not very well experienced in neurohistology, so he was not able to ensure support to the young scientist. In spite of this, he played a crucial role in his career. He called his attention to the thigh-glands of lizards. Then he finished his doctoral thesis titled: "Comparative anatomical, histological and physiological studies on thigh-glands of *Archaeo-* and *Neolacerta* species". MÉHELY called his attention to the innervation of lizard penis on the basis of phylogenetic considerations. From this work he wrote his thesis: "The innervation of the lizard skin". He was the first who found intraepithelial and corial nerve endings in the genital organs. The results were determining for his further research work. In 1926 he wrote his professorial thesis titled "The histology of vertebrate animals", then he gave his entrance lecture titled "Nerve endings".

He was the candidate for the place of head of department after the death of Méhely. It is incomprehensible even now, that he was not appointed. On the 1st of August 1934 he leaves Budapest and the PÁZMÁNY PÉTER University. He became the head of Department of Zoology at the Teachers' Training College. At that time Szeged was the second largest town of the country. The town accepted him and he also was fond of the town. The neglected department was recreated with very busy scientific life. The students were selected from the most capable and devoted secondary school pupils. They were listening the lectures of high university level with enthusiasm, and some of them joined to the research group too.

In 1938 he was the research fellow of Neapolitan Zoological Station. He worked at the same Hungarian desk where the famous Hungarian biologist, neurohistologist ISTVÁN APÁTHY earlier. In the 1st of September 1939 he was promoted to the leader of the Teachers' Training College. After he had made prosper a department, he could do it with the whole college.

In 20th of November — as it was expected — he was promoted to the director of the Department of General Zoology and Biology, where among his ancestors were the outstanding ISTVÁN APÁTHY and JÓZSEF GELEI. He was a successor

worthy of his ancestors. The department soon became a unique establishment rich in modern equipment, and modern scientific attitude. The nicely arranged collection of animals with the famous bird collection of PETER BERETZK occupied the main hall on the ground floor. This unique collection unfortunately was lost later. Each biological subject except botany was taught in this department and this meant a lot of work. At the same time an important multilateral research work was done here too. It is not accidentally that the windows of the department were lighting till late in the night. The windows of professor ÁBRAHÁM's laboratory were light too. Perhaps the greatest and most valuable neurohistological collection of 19.500 sections and preparates were made by his colleagues, MÁRIA CSOKNYA, LAJOS ERDÉLYI, MÁRIA FISCHER, IMRE HORVÁTH, EMIL MINKER, and especially with the help of ARANKA STAMMER. Each preparate is a historical example of the devoted care, demand, the ideas of the creators. These preparates tell us about the methods, aims, motives, of his research work which embraced almost the whole animal world and in some respect the human organism as well. His research dealt with almost all problems of light microscopic study of nervous system, the questions of morphology and function, the phylogeny, and often pathological aspects too.

He considered that the good methods are crucial in the research, so he made experiments to improve, or find out new procedures, especially during the first period of his career. For example, he applied his own method and the methylene-blue staining of Ehrlich for the identification of exteroceptors of *Amphipods* and *Amphibia*. He used the silver impregnation methods of RAMON Y CAJAL, GOLGI, BIELSCHOWSKY, BIELSCHOWSKY-GROS, the gold-toning methods of BIELSCHOWSKY, CAJAL-LENHOSSÉK, STÖHR and JABONERO. In 1926 he preferred the STÖHR-method, but later he discovered the advantages of BIELSCHOWSKY and BIELSCHOWSKY-GROS methods. The majority of his preparates was made with silver impregnation by BIELSCHOWSKY-ÁBRAHÁM. The sections made in this way are very beautiful, clear, free of disturbing factors.

He very rarely made photographs of his preparates. He was for the drawings. So he could follow the course of nerve fibres, their spatial arrangements, connections. He was right. His drawings were always authentic.

He was a devoted neuroscientist throughout his life. It is difficult to emphasize any of his results. Perhaps the research of receptors could be emphasized. He started his research career with this and reached new and newer results. In this field he is among the best scientist of the world. Two scientific books were published in this field by the Publishing House of the Hungarian Academy of Sciences: "The Histological Atlas of Receptors" (1972), and "Iconography of sensory Nerve Endings" (1981).

He devoted a considerable part of his life to the research of the innervation of cardiovascular system. He published fascinating pictures of the connections of nerve endings and smooth muscles, the sensory receptors of reflexes important in the regulation of blood pressure, about the baroreceptors (pressoreceptors), about the chemoreceptors sensitive for the chemical composition of blood, about nerve plexuses found in the heart wall of various animal groups, dendritic trees,

neurofibrillar endplates, loose, mainly encapsuled sensory nerve endings. The characteristic forms of sensory nerve endings appear in mammals without transition according to his studies. He draw phylogenetic conclusions from this fact. He published his results on the cardiovascular system in a monography in English, titled "The microscopic innervation of the heart and blood vessels in Vertebrates including man" (in a joint edition of the Hungarian Academy of Sciences and the Pergamon Press Oxford, 1968). In 1971—1972 he represented the results of his investigations on the heart of the *Mammalia* and the sensory innervation of blood vessels in 22 partly coloured tables of the "Atlas of cardiovascular pathology" which is in course of publications at Montreal.

His other remarkable research field was the comparative study of the innervation of the gastrointestinal tract, the neural connections in the enteric ganglia and in the smooth muscular layer of various invertebrate and vertebrate species. He described in details those similarities and differences which were detectable at the different synapses of various *Insects* and *Mollusca* and *Vertebrates*. On the basis of the experiments made on molluscs and on leech (*Hirudo medicinalis*) together with EMIL MINKER, he took the part of Neuron Thesis, which was his idea together with other famous scientists like RAMON Y CAJAL, MIHÁLY LENHOSSÉK and other. According to this the nerve fibres, neurofibrils do not go through the cells, centers, muscle fibres, they are not in continuity as it was announced by his prominent ancestor ISTVÁN APÁTHY, and other famous contemporaries. He recognized without doubts the essence and importance of contiguity in the neural transmission, which was supported not only with anatomical but functional, pathological and phylogenetic evidences as well. He was right. This is not in contradiction with the words written by him: "The nerve fibres of the smooth muscle have no visible end or if they have that it is something (terminal reticulum) that cannot be named a terminal at all." He established that the synaptic connections of vegetative nerve endings are extremely rare.

His works on the eye are also noteworthy. He described first the innervation of ocular muscles. It is a pity that he could not perform experiments on more animal species and so he could not publish a greater comparative study.

He was interested not only in the peripheral nervous system, the importance of ganglia, their structure. He tried to deal with the central nervous system as well. He described large, round neurosecretory cells from the prosencephalon of *Dytiscus marginalis*, which are very similar to the neurosecretory cells of nucleus paraventricularis and nucleus supraopticus of *Vertebrates*. He accomplished the study of innervation of heart and aorta with the localization of acetylcholinesterase. He was very interested in the presence, origin, migration of vesicles their role in the transfer: He sadly noted that the thousands of preparates could not give an answer to these questions. They were not able to give an answer. Classical neurohistologist asked the questions.

He was fascinated by the results of electron microscopic neuroanatomy. He also begins new research in this field at the age of 72. Until his death he published 38 articles in this field. He goes on the same way which was well-known at light

microscopic level for him. He did not lose his way in the submicroscopic world either. He proved again his words: "I write about things what I have seen, I write as I have seen . . . creating hypotheses, making axiomas, collecting theories, that is not my way!"

The irresistible instinct desire of childhood is chasing him to the free nature, especially to the mountains. They made excursions with his colleagues to the mountains Pilis, Mátra, Bükk, to the fresh springs and streams. The results of these excursions are his hydrobiological publications, which are closely related to his life-work. Besides research teaching job was his other favourite work. Thousands can remember his exciting, logic, excellent lectures, and thousands can use the knowledge got in this way in various departments, laboratories. A great number of textbooks, handbooks, reviews of general or scientific interest contain his knowledge, his ideas connected with deep theoretical or with the practical life.

He was a globe-trotter. He did not want to learn abroad, but to teach there too. To reveal those secrets, which were known by him through his preparates. He thought everything can be found in the books and scientific articles. He loved truth, he found and formulated his own truth. He was acknowledged both at home and abroad. He was member of famous societies, he won a lot of prizes. In 1945 he is the correspondent member of Hungarian Academy of Sciences. In 1953 he won the KOSSUTH prize for his research work made on the basis of Pavlovian theories. In 1955 he was chosen to outer member of Academy of Zoology Agra (India), in 1958 the Royal Society of Medicine (London). In 1960 he became the ordinary member of Hungarian Academy of Sciences. Ordinary and honorary Chairman of the Hungarian Biological Society, which was organized by him. Besides the golden order of labour he won the flag order of the People's Republic Hungary, which is a prize for the most outstanding personalities.

He went on pension in the 1st of August 1967, at the age of 74. He cited meditating the great truth: "which rises, goes down, who was born, is getting older." Yet, the pension is a painful fact for him, since he feel himself strong and active. He keeps working, but he misses the teaching job very much. He hardly notices the passing of time. He is walking with straight back along the riverside of Tisza, not realizing that his heart beat is slowing down. Then the spring is exhausted, and he exists only in his works and in our memories. We realize, that the last distinguished great representative of Hungarian classical neurohistology was buried in the Farkasréti cemetery.

FERENC BICZÓK