

In Memory of Liliana Lubińska

In November 1990 passed away Professor Liliana Lubińska, one of the most known Polish neurobiologists, a member of the staff of the Nencki Institute of Experimental Biology for many years.

I had the opportunity to know Liliana Lubińska from our school-days and our close friendship survived to the end of Liliana's life. We were going to the same secondary school and in 1923 we both entered the University of Warsaw to study biology. After one year Liliana moved to Paris where she began her studies in biological sciences at the Sorbonne. In 1927 she graduated in biological chemistry and physiology and in 1932 she obtained the degree of Doctor of Natural Sciences. Her doctor thesis on noniterative reflex was prepared under Professor L. Lapique and she was awarded a prize for it by the Academy of Paris. From her early youth Liliana was interested in animal physiology. Thus, the position of assistant in the Laboratory of General Physiology offered her by Lapique was for her not only an honour but also a fulfilment of her dream. From the beginning of her scientific career Liliana treated the possibility of doing experimental work as a privilege and great pleasure. Therefore, contrary to the common opinion, she was convinced that salaries of scientists should not be too high. This youthful view she changed with age. In the Laboratory of Lapique Liliana Lubińska worked hard experimentally and published several papers mainly on linguo-maxillaris reflex and on nerve chronaxie. Simultaneously she was teaching students. Although as a bright scientist, Liliana could remain at the Sorbonne, she decided to return to Warsaw, where she wanted to work at the Nencki Institute. At that time practically no research in neurophysiology was being done in the Institute. However, Professor K. Białaszewicz, Head of the Department of Physiology of the Institute was impressed by Lubińska's competence, her experience in neurophysiology and her enthusiasm. He agreed to help her and

Liliana obtained the position of an assistant (1932). She prepared a precise and interesting project of her studies on Magnesium „narcosis”. This early period of studies brought to light positive features of Liliana as a scientist: the broad view on physiological processes, experimental skills and abilities to formulate hypotheses.

Before the outbreak of the Second World War Lubińska had studied the effect of different agents on excitability of neuromuscular preparation. She also took part in experiments of Jerzy Konorski and Stefan Miller on conditioned reflexes. It seems important to mention that Liliana herself has never been emotionally engaged in experiments on brain function. She thought that the complicated morphological structure of the brain made it extremely difficult to get clear results with currently available techniques.

During the siege of Warsaw Liliana and her husband, Jerzy Konorski, stayed with me and my family at our home, because that part of the city they had been living got partly destroyed. Since they did not want to stay under Nazi occupation, they decided to leave Warsaw as soon as possible and go east, although it was not clear how they would manage. After a long peregrination they arrived to Sukchumi (Caucasus). There they worked in the Department of Physiology of the Institute of Experimental Medicine until the end of war. During that time Liliana worked alone or with Konorski on regeneration of peripheral nerves and on their excitability. She continued these studies later on. In summer 1945 Lubińska and Konorski returned to Warsaw. A few former coworkers of the Nencki Institute decided to reactivate it. Liliana was one of the members of the Organizing Committee.

I remember that Liliana was so eager to start the experimental work that she put cages with rats and aquaria with frogs and began to investigate regeneration of nerves in her own room in the apartment which was the first temporary location of the Institute in Lodz and simultaneously served as lodgings for 4 persons. Liliana began intensive and fruitful scientific work when the laboratory equipment was gradually improving.

Liliana Lubińska devoted practically her whole life to studies on peripheral nervous system. The main aim of her research was to elucidate the mechanism of functioning of the neuron with its small cell body and long axon. She wanted to know how the substances produced in perikarya are transported to nerve endings. Thus, the events taking place during regeneration and Wallerian degeneration of peripheral nerves, as well as the physical properties of peripheral nerves and interdependence of Schwann cells and axons – were not separate topics investigated by Liliana. She regarded them as different aspects of the main problem: of the trophic functioning of the neuron. Liliana used rather simple methods, but she always tested them in details. She elaborated a method for isolation of teased nerves. It proved to be very useful for investigation of longitudinal distribution of various compounds in axons.

In the late fifties it seemed important to introduce neurochemistry to the Institute. Liliana encouraged me to begin joint studies on transport of some compounds along axons. For me it was a very difficult decision to change my research field (I worked on insect biochemistry), but Liliana was so enthusiastic about extension of her studies by new approach and new techniques that I agreed to try. The beginning was extremely difficult: new problem, new material, new methods. Together with my young co-workers (in those times University students) Barbara Oderfeld, Lucyna Szwarz, and later on Jolanta Skangiel and Irena Zawadzka we started to study the behaviour of acetylcholinesterase (AChE) in peripheral nerves under various physiological conditions. Our joint work, which lasted many years, appeared to be not only interesting but also important for elucidation of some problems connected with axoplasmic flow.

Liliana was a scientist of uncommon intellectual qualities: her invention was joined with profound knowledge of biological phenomena: she was an excellent experimenter and I think that for young persons the work with her was an extremely useful lesson for the whole life. She was so concentrated during an experiment that it influenced the whole staff. The experiment was prepared in all details and there was no place for „improvisation”. It was not easy to meet Liliana’s requirements, but when the experimental results confirmed our working hypothesis, the whole team was delighted. I remember always the happy day when the measurements of accumulation of AChE in transected nerves below the injury could be interpreted in terms of retrograde movement of some axoplasmic components. The design of future experiments with Liliana was an intellectual pleasure for all of us. She seemed to be untiring during the discussions about experimental plans. We developed the experiments in many details which allowed among others to calculate the velocity of transport of AChE in both directions. These biochemical results together with histochemical data got by Liliana Lubińska and Jiřin Zelena were the experimental basis of the theory of bidirectional transport in axons formulated by Liliana. This theory was presented at many International Symposia and Congresses. In the beginning it met some criticism, most probably because it was inconsistent with the theory of P. Weiss, which was generally accepted. Later on the theory of L. Lubińska became commonly approved. The recent studies on axoplasmic transport showed many new and important results, but the idea of retrograde movement of some axoplasmic components presented more than 25 years ago by Liliana Lubińska seems to be correct up to this day.

Liliana had an exceptionally great capacity to correlate the results got by different techniques. The profound knowledge of literature helped her to formulate her own opinions on many basic neurobiological phenomena. With full esteem for the achievements of previous researchers she did not pay superfluous attention to recognized authorities. Her two extensive reviews: „Axoplasmic streaming in regenerating and in normal nerve fibres” (1964) and „On axoplasmic

flow” (1975) are still of fundamental significance. They include comprehensive confrontation and, it happens that reinterpretation of experimental data and views of many authors. Liliana Lubińska presents there also her own experimental data and their explanation. Although some of these views were changed nowadays according to the new data – the excellent reviews by Liliana still remain the source of useful information and, therefore, are still often quoted in international literature.

The last paper by Liliana was entitled „Pattern of Wallerian degeneration of myelinated fibres in short and long peripheral stumps and isolated segments of rat phrenic nerve. Interpretation of the role of axoplasmic flow of the trophic factor” (1982). Liliana tried to explain some phenomena of degeneration in terms of events connected with the role of trophic factor which was not experimentally investigated in her study. Although, according to the new data some views presented in this paper should be perhaps changed, the idea of Lubińska seems very interesting. Moreover, this paper shows that even with simple methods one can solve important questions, if the experiments are well planned and the results competently analysed. In this respect Liliana Lubińska was a master.

Professor Liliana Lubińska, in recognition of her scientific achievements, was elected foreign member of the German Academy of Natural Scientists – Leopoldina, she was an honorary member of the Polish Physiological Society, a member of many Polish and International Societies and of the Editorial Board of „Neuroscience”.

Liliana Lubińska will be remembered by her colleagues at the Nencki Institute not only as an outstanding research totally devoted to work in neuroscience, but also as a friend always ready to help in solving scientific problems, in writing papers or in getting information from her rich card-index of literature.

Stella Niemierko, Warsaw, Poland