



## *Editorial*

### **The birth of biochemistry in Łódź**

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The creators of biochemistry in the new academic center which Łódź became after World War II were Antoni Dmochowski, Ernest Sym and Bronisław Flipowicz. All three came from the pre-war Chair of Physiological Chemistry at the Medical Faculty of The University of Warsaw headed by Professor Stanisław Przyłęcki who disappeared in the tragic days of the Warsaw Uprising. Professor Antoni Dmochowski was at the same time a co-organizer of Łódź University (UŁ) created on May 24, 1945 and considered as a continuation of the Łódź Section of The Free Polish University (WWP) which existed for 11 years (1928/29–1939). The links of Prof. A. Dmochowski with this section went back to 1934 when as an Associate Professor of the University of Warsaw he conducted classes in biochemistry (then called physiological chemistry) as Head (from 1937) of the Chair and Department of Physiological Chemistry located in Warsaw and with a branch in Łódź – the first chair of that speciality set up in Poland outside the medical faculties.

On the suggestion of Prof. Teodor Vieweger, the WWP president before the war and the main organizer of UŁ, Prof. A. Dmochowski started to work at this university (March 12, 1945) becoming the creator of the first University Chair of Biochemistry in the Mathematical-Natural Science Faculty which he headed

for 22 years (1945–1967). The first head of the Department of Physiological Chemistry at the Medical Department until October 31, 1946 was Prof. E. Sym, who moved to Gdańsk. Therefore this laboratory was taken over after him by Prof. A. Dmochowski, who lectured and examined at the following faculties: Medical, Dentistry and Pharmaceutical (which were part of UŁ until the end of 1949) and Mathematical-Natural Sciences, and also at the Polytechnic. The teaching duties were enormous. At the Department of Physiological Chemistry e.g. in the years 1948/49 courses in physiological chemistry and general chemistry were given simultaneously for about 1500 students of the first two years of medicine and dentistry and courses in biochemistry for several hundred pharmacy students.

Łódź then had assembled an outstanding group of scientists from the universities in Vilnius, Lviv and Warsaw. Among them were, among others, workers from the pre-war Nencki Institute of Experimental Biology transiently reactivated in Łódź in the years 1945–1953. Many of them left to go to the capital when a decision was taken to rapidly rebuild it but Prof. Antoni Dmochowski did not leave Łódź in spite of the tempting proposal to take over a chair in Cracow or Warsaw. These were years of intense organizational work aimed at creating a base for teaching and scientific

tasks, at the same time teaching students with various levels of preparation with the need to set up courses and labs simultaneously for several different years of studies. All this was done from scratch and practically with no resources.

It was not an easy task due to the complete lack of textbooks. A great help was the preparation by Prof. Dmochowski already in 1946 a translation of a physiological chemistry manual of E. Lehnertz published by the Circle of Medical Students at UŁ. Under his editorship the first complete Polish manual of physiological chemistry was published based on the unfinished lecture notes published during the war by Prof. S. Przyłęcki. This manual bearing the name of its dead author was prepared by a group of his colleagues and collaborators who were – from Łódź – A. Ber, T. Czystochorski, A. Dmochowski, B. Filipowicz, W. Niemierko, E. Sym and from other centers J. Heller, Z. Ledóchowski, W. Mozołowski, P. Wierzchowski (2 editions of approx. 600 pages appeared in 1947 and 1950).

Prof. Dmochowski's greatest achievement was the chair of Biochemistry set up in UŁ on September 1, 1945 and its development in respect to facilities can be a certain measure of the difficulties which he then had to overcome. In the years 1945–1948 it was located in two small rooms in the building of the former School of the Assembly of Merchants at 68 Narutowicz St. in which just after the war most of the Departments of The Faculty of Mathematics and Natural Science and also the Department of General and Physiological Chemistry of the Medical Faculty were located. In 1948 the Chair of Biochemistry obtained its own building at Lindleya 6 initially foreseen for apartments. It was composed of 7 rooms with a joint area of 118 m<sup>2</sup> completely unsuitable for teaching or research. Today it is difficult to imagine what difficulties had to be overcome then to adapt such a building for biochemical labs. Expeditions had to be made in order to discover sources from which a part of the sanitary, water or gas installations could be bought. There were no appropriate

facilities and nothing in these rooms, no laboratory tables and nothing to put on them. There was, however, something – an atmosphere of joy and excitement, which is given by the energy leading to the creation of new things forbidden during the tragic and cruel years of the occupation. The acquisition of equipment, reagents, glassware, books, required enterprise and inventiveness and much work and sacrifice. But work was performed gladly under the direction of an enthusiastic and untiring leader.

At the same time reorganization and reforms of studies took place. After separation of the Medical Department from UŁ (1950) the Mathematical-Natural Science Faculty was divided into the Faculty of Mathematics, Physics and Chemistry and The Faculty of Biology and Earth Sciences. The Minister of Higher Education and Science charged Prof. Dmochowski with the task of organizing of this second Faculty. He was the first dean of this faculty for many years (1951–1958) and in 1956 he created a new speciality for students – biochemistry.

In these difficult conditions research was initiated. The main subject of research were nucleic acids, as a continuation of A. Dmochowski's Doctor of Science dissertation "On muscle purines" in 1932. Before becoming an Associate Professor he studied among other at the Rockefeller Institute in New York with a scholarship from the National Culture Fund studying with the famous specialist in nucleins, P.A. Levene. A. Dmochowski's monograph "About the contemporary state of nucleic acid chemistry and physiology" in 1935 was the third elaboration of this type in international literature, and for many years the only fundamental source of knowledge from the field of nucleic acids. He can be considered as the initiator of research on nucleic acids in Poland and included among those who created a path for others to study the structure of these compounds.

Regardless of his own interests Prof. A. Dmochowski was a proponent of multidisciplinary

rectional education of biochemists. Thus the research themes of the chair created by him was always differentiated. Right after the war (1945–1949) two topics were developed, i.e. analysis of hemoglobin and its pepsin digestion products which were a continuation of his PhD. dissertation from 1924 (T. Czystochorski) and the mechanism of penicillin activation by iodine compounds (E. Łoza). The directions of research after 1950 were; 1) nucleic acids and nucleoproteins of normal and pathological tissues extended by investigations on chromatin and its proteins (L. Kłyszajko-Stefanowicz, E. Sempłńska, Z. Walter, R. Wierzbicki and J. Bartkowiak); 2) hemoproteins and adenine compounds of blood and normal and pathological tissues (W. Leyko, R. Gondko, Z. Józwiak, W. Duda and Z. Szweda-Lewandowska); 3) phosphorus compounds of fibrinogen and fibrin extended by the blood clotting process (E. Łoza and T. Krajewski); 4) biochemistry of psoriasis and rheumatoid arthritis in respect to ceruloplasmin, cytochrome *c* and nucleic acids (E. Łoza, A. Zgirski and D. Tyrawska-Spychałowa); 5) glucosamineglycuroglycans (acid mucopolysaccharides) of human arteries (M. Schmidt and B. Wachowicz); 6) regulators of normal and pathological plant growth (W. Maciejewska-Potapczyk, E. Sempłńska and H. Urbanek) and pectin substances (H. Łukasiak). In these research areas Prof. A. Dmochowski trained numerous biochemists in Łódź including professors, assistant professors, PhDs and numerous MScs.

Several months before separating the Medical and Pharmaceutical Faculty from the structure of the University of Łódź and forming a separate university, the Medical School, Prof. Bronisław Filipowicz took over as head of the Chair of General and Physiological Chemistry from Prof. A. Dmochowski (Sept. 1, 1949). In this first period vitamins were important in both the lectures and the research of Prof. B. Filipowicz. This was probably due to two facts: 1) avitaminosis, in addition to malnutrition, was a painful experience for people who had survived the war; 2) gradually

in the 1940's the role of vitamins as coenzymes or their components was becoming known. This was reflected in research on phosphorylation of thiamine and its analogs which led to PhDs in the 1960's (S. Witkowski, A. Brzeziński, T. Gałomon).

The first signs of active interest in the problems of nucleic acids in the Chair of General and Physiological Chemistry of the Medical School were publications in *Acta Physiologica Polonica* (1952) concerning the DNA and RNA content in the human pancreas and the application of the, then very modern, method of polarography to determine adenine (B. Filipowicz, W. Leyko, W. Więckowski). The publication of papers on pure biochemistry in a physiological journal was something very unusual. Biochemists were then in a section of the Polish Physiological Society. Prof. A. Dmochowski had been one of the founders and member of the Board in the 1930s. In the first Editorial Council of *Acta Biochimica Polonica* the only representative from Łódź was a physiologist, Prof. M. Wierzuchowski. A certain habit, or perhaps a continuity of subjects, led to papers by biochemists appearing more often in *Acta Physiologica Polonica* than in *Acta Biochimica Polonica* in the 1950s and at the beginning of the 1960s.

Technical conditions improved gradually. In the early 1950s in visible light absorption the Pulfrich photometer with a set of filters, visual observation of fields in the binocular and reading the absorbancy on a scale of drums predominated. Obtaining a Unicam SP500 spectrophotometer which came to the chair as a result of a set of complicated circumstances was a breakthrough. The complexity was due to the Austrian origin of the equipment. Due to the limitation in export to beyond the "Iron Curtain" of high technology equipment the British producer could not sell it to Poland (it was sold by a Viennese firm substituting the original label with its own).

An expression of the consolidation of the nucleic acid subjects initiated in the Łódź center headed by Prof. A. Dmochowski and contin-

ued by Prof. B. Filipowicz was the organization in Łódź by the Biochemical Committee (PAS) of the VI Symposium (March 11–12, 1955) devoted to nucleic acids and nucleoproteins (in a total number of 35 communications and presentations 28 were from the Łódź University and Medical School).

A certain loosening of the political regime in the second half of the 1950s resulted in the first scientific visits to West European Laboratories. J. Wiśniewski (1956) and S. Golewski (1958) worked in the laboratory of Marianne Grunberg-Manago on the properties of polynucleotide phosphorylase, the first purified enzyme synthesizing polynucleotide chains and from the Łódź University L. Kłyszczko-Stefanowicz (1957/58, 1959, 1961) in the laboratory of Yvonne Khouvine on nucleoproteins (all at the Institut de Biologie Physico-Chimique in Paris) and E. Łoza (1957/58) in the Nobel Institute in Stockholm with A.H.Th. Theorell, a Nobel Prize Winner, and in 1963 in the group of Piotr Słonimski in the Laboratoire de Genetique Moleculaire in Gif-sur-Yvette.

Prof. B. Filipowicz allowed his collaborators a choice of the research area, but always attached considerable importance to nucleic acids. In the Chair methods of nucleic acid and nucleoprotein isolation and analysis from varied material: thymus, pancreas, protozoa and yeast (S. Golewski, H. Panusz, M. Gross, B. Wiśniewska-Skoczylas, H. Poznańska, K. Pilek, M. Gniazdowski) were developed as well as analysis of nucleotides and other phosphate esters of erythrocytes initiated by W. Leyko (DSc. 1960) and continued in the work of her graduate students (J. Lorenc, J. Greger, B. Zachara). An important subject was also work linked to the clinic and analytical methods (J. Skarżynski).

In parallel to the creation of *Postępy Biochemii* (*Advances in Biochemistry*, 1953) and *Acta Biochimica Polonica* (1954) the organization of the biochemical milieu crystallized. In 1957 a Temporary Management of the Polish

Biochemical Society was set up, which included Prof. B. Filipowicz, also as President (1961–1963) in the second term of the already registered Society. The first President was Prof. A. Dmochowski (1959–1965) and the vice-president was Prof. W. Filipowicz.

The development of biochemistry was also marked by the increase in the number of institutions in which this science was applied. Due to Prof. Galas first a laboratory of Biochemistry and then a Chair of Technical Biochemistry was set up at the Faculty of Nutritional Chemistry of the Łódź Polytechnic. Biochemistry was also done in the Department of Industrial Toxicology of the Institute of Occupational Medicine directed by Prof. Jerzy Piotrowski.

The moment of presentation of the achievements of the Łódź biochemical milieu and at the same time the first so numerous meeting of persons participating in biochemistry in Poland was the 1<sup>st</sup> National Biochemical Congress organized in Łódź (Sept. 4–7, 1963). It assembled over 600 participants both members of the Polish Biochemical Society and persons outside the Society. 460 presentations and communications were given, 45 came from Łódź. The lecture inaugurating the conference given by Professor W. Mozołowski from Gdańsk, devoted to the progress of biochemistry and to an ethical reflection on the paths of its development was the presentation of independent thinking untypical for the times. The Congress took place in the buildings of the Łódź Polytechnic. This Congress finished Prof. B. Filipowicz's period as a President of the Polish Biochemical Society and at the same time can be considered as the end of the preliminary period of the development of biochemistry in Łódź. Both its creators are honorary members of the Polish Biochemical Society and have honorary doctorates from their Universities (A.D. in 1977 and B.F. in 1984). Prof. A. Dmochowski also became a Laureate of Łódź for organizing biochemical studies and a strong biochemical center.