

Z KART HISTORII/FROM THE PAGES OF HISTORY

ESTABLISHMENT AND DEVELOPMENT OF CHEMISTRY AND CHEMICAL TECHNOLOGIES IN THE LVIV POLYTECHNIC UNIVERSITY (PART 1)

The years 2021 and 2022 have become jubilee years for the chemists of the Lviv Polytechnic University because 150 years have passed since two important dates: 1) on June 18, 1871 the **Department of Chemical Technology** was founded, which was the beginning of professional chemical and technological education; 2) in 1872 the **School of Technical Chemistry** was created from several departments of the chemical profile, which became the prototype of the current Institute of Chemistry and Chemical Technologies (ICCT). These events made it possible for the then Technical Academy to move from general chemical to chemical-technological education and create a full cycle of qualified chemical engineers training according to European standards. At the same time, the establishment of other two professional schools – engineering and architecture, followed by the creation of a mechanical engineering school, led to the transformation of the provincial academy into a Polytechnic school, that is, a classical Polytechnic. Since that time, Lviv Polytechnic has been one of the leading higher technical educational institutions in Central and Eastern Europe and for more than 150 years has been providing the chemical and other branches of industry with qualified chemical engineers and scientists. Lviv Polytechnic has made a significant contribution to the formation and development of industry in Galicia, Poland, the former USSR, and Ukraine.

The history of chemistry and chemists at the Lviv Polytechnic during the Austro-Hungarian and Polish periods is largely covered in works [1–5], partly in works [6–10], where the history of the entire institution was described. The work [11] is a more complete version, which includes also the Soviet period. The purpose of this work is the analysis of educational and scientific processes evolution and the transformation of chemical divisions at the Lviv Polytechnic University, as well as the description of famous chemists working at Lviv Polytechnic activities since the School of Technical Chemistry establishment.

ANALYSIS OF INFORMATION SOURCES

The teaching of chemical subjects as basic disciplines in the technical specialists training at Lviv Polytechnic dates back to the establishment in 1816 of the **Real School** with a techno-commercial bias. The main place in the curricula of the Real School was occupied by natural and

mathematical disciplines, among which was chemistry (3 hours weekly in the third year of study) [6]. Professor of the lyceum Anton Gloisner, the Faculty of Philosophy of Lviv University graduate, taught chemistry. In addition, the first- and second-year students studied such subjects as natural history and technology containing separate sections related to chemical production. Practical skills were obtained in the chemical laboratory located in the school building.

At that time the Real School provided some technical knowledge necessary for further professional activity, but the level of this knowledge did not meet the region's economy growing needs, so the Halytskyi Sejm repeatedly tried to reorganize the School. However, the Viennese government did not support these initiatives for political reasons, and, on the contrary, turned the institution into a Real Trade Academy without a full-fledged technical department. Only on November 4, 1844, in accordance with the decrees of Emperor Ferdinand I, the **Imperial-Royal Technical Academy** was opened in Lviv, which was the beginning of higher technical education in Galicia. Among the six main departments of the academy was the **Department of Technical Chemistry** [6], which provided a higher chemical education.

The first professor of chemistry at the Technical Academy was Friedrich Rochleder (1819–1874) (Fig. 1), a famous scientist in the future, and one of the founders of phytochemistry and structural chemistry. He taught general and, partially applied chemistry (5 hours weekly) [6] and initiated scientific research on plant substances. On the ground floor of the academy building, he set up a chemical laboratory and collected a mineral collection. However, as there were not enough full-fledged courses in chemical technology and mineralogy to train qualified specialists, the practical training was minimal, so graduates of the academy were forced to develop their knowledge in other educational institutions. The second professor of chemistry, Gustav Wolff (1805–1873), did not significantly change the curriculum but supplemented it with a new course in mineralogy, geology, and paleontology [6].

In the middle of the 19th century, the economic evolution of Europe accelerated. The railways, cloth manufac-



Fig.1. F. Rochleder

tories, paper, guts, ceramic and iron-making enterprises were built in Galicia, a large sugar factory was built in Stanislaviv region, the development of the potash salts deposits began in the Carpathian region. At the same time, oil and wax production increased, and many small distillation enterprises were already operating. The study of mineral deposits of Galicia and the need to create technologies for their processing, the implementation of chemical achievements in agriculture, and the development of new technologies for processing the obtained products required the creation of appropriate scientific and educational centers for the qualified chemists training. However, there were only a few chemical laboratories in Lviv for the whole Eastern Galicia, and the training of chemists at Lviv University and the Technical Academy did not meet the requirements of the time.



Fig.2. R. Günsberg

The expected changes began at the Technical Academy in 1857 with the arrival of Rudolf Günsberg (1823–1879) (Fig. 2) to the Department of Chemistry. He founded teaching and scientific research in the field of organic and inorganic substances chemical technology at the Academy, organized a laboratory of chemical technology and modernized the existing chemical laboratory [1, 2]. The results of his scientific research in the alcohol area and vodka production technology, processing of ozokerite, proceeding of the ammonia-soda process, hydrocarbons properties, etc. were published in the European and American scientific journals. He also published a fundamental work "Podręcznik o wyrobie spirytusu" and a series of articles on teaching chemical technology in higher technical schools. The R. Günsberg activities prepared the basis for the formation of chemical-technological education and science at the Technical Academy, and the creation of the **Department of Chemical Technology**.

In the 1870s, the government gave permission for the academy reorganization: the six new departments creation, the replacement of the German teaching language with Polish, an increase in the professors annual salary, and the construction of special buildings for the academy. Among the new departments, the Department of Chemical Technology was founded by the imperial decree of June 18, 1871. R. Günsberg was appointed



Fig.3. A. Freund

as the Head of the Department, which began to play a major role in the technologist chemists training. With the emergence of mentioned Department, a full cycle of qualified chemical engineers training was created. Accordingly, the Department of General and Technical Chemistry was transformed into the Department of

General and Analytical Chemistry. Since May 1872, it was headed by August Freund (1835-1892) (Fig. 3), a well-known organic chemist, whose field of scientific research covered fermentation processes, oil composition and properties, synthesis and structure of ketones, etc. The greatest achievements of A. Freund was the the cyclopropane synthesis discovery (in 1881 this reaction was given his name) and the establishment of its structure, as well as the development of a method for obtaining ketones and chloride anhydrides. He is the author of one of the first Polish textbooks "Zarys chemii do szkół gimnazjalnych" (1883).

In 1872, as a result of the Technical Academy reorganization, separate departments were united into three professional schools, which were later changed into departments, then faculties, and then institutes. So, that year, the academy actually turned into a Polytechnic, which was later formalized by the imperial decree of October 8, 1877. Among the first schools was the School of Technical Chemistry, which initially consisted of two departments – the Department of Chemical Technology and the Department of General and Analytical Chemistry. On October 29, 1872, the third department – the **Department of Mineralogy and Geology** was created, which provided students with knowledge about mineral raw materials for chemical production, their occurrence, and properties. It was headed by Julian Medvedskyi (1845-1918) (Fig. 4) who was a famous geologist and petrographer, a researcher of salt, oil, and other mineral deposits in Galicia, and a known public person [12]. While equipping the newly created department, he organized



Fig.4. J. Medvedskyi

an educational and scientific geological laboratory and a mineralogical museum, started regular geological expeditions around the region, and gathered a collection of rocks and minerals, which in terms of the systematization level and the samples number was one of the best in Europe. He published about 100 scientific works, and a number of textbooks on mineralogy, petrography, and geology. In addition to the mentioned departments, the School of Technical Chemistry opened the Center for doctoral training in **zoology and botany**, since at that time the products of agriculture and animal husbandry were the main raw materials for chemical production. Emil Godlewski (1847-1930), a botanist, agrochemist, and the Polish school of plant physiology creator was appointed as Associate Professor.

Since the 1872/73 academic year the School of Technical Chemistry began qualified specialists in chemical technology training. At first, the training lasted three years, and since 1874 – four years. The curricula were sufficiently filled with general education and special disciplines and significant amounts of laboratory and project



Fig. 5. The view of chemical building in the XIX century.

work. The educational and scientific capabilities of polytechnic chemists increased especially in 1876 after the chemical building construction, which, at that time, was one of the best among similar laboratories in European polytechnics (Fig. 5).

In 1877, the Technical Academy was renamed to the Imperial-Royal Polytechnic School and equalized in rights with other academic schools of the monarchy [6]. The school became the main higher technical educational institution of Galicia, providing versatile and thorough, as at that time, chemical and chemical-technological education. The school had the necessary material and technical base, lecture halls, laboratories, and museums. Academic disciplines were taught by highly qualified professors R. Günsberg, A. Freund, J. Medvedskiy, who, in addition, introduced students to scientific research, carried out by them.

The rapid development of oil production and oil refining in Galicia in the 1870s and 1880s, the cities development, and transport routes led to the opening of new educational and research divisions at the Polytechnic School. In 1885, two-year mining courses (education in the field of oil extraction), and one-year metallurgical courses were opened, and since 1886 – research oil and ceramic stations at the Faculty of Technical Chemistry [6].

Since 1880, the Department of Chemical Technology was headed by Julius Brühl (1850-1911), who significantly expanded the teaching of the inorganic substances technology (production of mineral fertilizers, acids, glass, metallurgy of iron and zinc), food, and other products technologies. In 1883, he moved to Heidelberg, where he became famous for his research on the dependence of the organic substance structure on light absorption, refraction and scattering.

Bronisław Pawlewski (1852–1917) (Fig. 6) became the new long-term Head of the Department of Chemical Technology. He was a versatile scientist, the author of

numerous works in the fields of organic chemistry, mining and geology, brewing, sugar production, metallurgy, wood processing, leather and others [13]. He studied the physicochemical characteristics of various substances, the reactions kinetics, and the rules of binary systems heating, which gives reason to consider him one of the physicochemical analysis founders. During 1886-1891, Professor Pawlewski managed the Regional Research Oil Station, published a number of works, and four textbooks on petrochemistry, among which the most important was “*Technologia nafty i wosku ziemnego*”. He became the founder of teaching and systematic scientific research in this direction at the Polytechnic School.

In 1891, he transferred the management of the oil station to Roman Zalozetskyi (1861-1918) (Fig. 7), who taught oil and ozokerite technology as a private docent from 1888. R. Zalozetskyi developed the basics of oil refining and became a leading expert in oil technology and one of the oil geochemistry founders. He published more than 106 scientific works on these themes, wrote a textbook, initiated the creation of the journal “*Nafta*” and for a long time was its editor [14].

In 1891, another department was created at the Faculty of Technical Chemistry – the **Department of Botany, Zoology and Commodity Studies**, which was headed by Ostap (Yevstakhii) Voloshchak (1835-1918), a biologist and researcher of the Carpathians flora [15]. He founded



Fig.6. B. Pawlewski



Fig.7. R. Zalozetskyi

a botanical garden and a natural history museum, formed a dendrological collection and a fund of standard herbarium collections at the Polytechnic School.



Fig.8. S. Niementowski

From 1892 to 1925 the Department of General and Analytical Chemistry was headed by Stefan Niementowski (1866-1925) (Fig. 8), a well-known organic chemist. He studied aromatic and heterocyclic compounds, and his main achievements were the condensation reaction of aromatic o-amino acids and acid amides (known to all chemists as the Niementowski reaction), a study of anthraquinone derivatives, and preparation of new 2,5-naphthyridine derivatives.

All departments had museums and laboratories equipped with advanced laboratory installations. The research stations equipment was purchased at the expense of funds from the works performed. Most of the Faculty departments were located in the chemical building. The Department of Mineralogy and Geology, the Department of Botany, Zoology and Commodity Science, as well as the museums, were located in the main building. Graduates of the Faculty had thorough theoretical and practical training, therefore, despite the difficult economic situation in Galicia, they quickly found jobs and became a reserve for the teaching staff of their *alma mater*.

Intensive development of the Faculty of Technical Chemistry took place at the beginning of the 20th century. The creation of separate departments specialized in various areas of chemical technology began. Before that, the training of specialists in inorganic, organic and food technologies took place in one department.



Fig.9. W. Syniewski

It resulted in insufficient training for students and difficulties in combining relevant subjects in the educational process. In the 1903/04 academic year a new **Department of Chemical Technology II (processing of agriculture products) and Technical Microbiology** was separated from the Department of Chemical Technology [1]. It was headed by Wiktor Syniewski (1865-1927) (Fig. 9), a researcher of starch and enzymes and the author of the original theory of starch structure and known textbook "Mikrobiologia fermentacyjna". He was the editor of the journals "Gorzelnik" and "Gorzelnictwo".

In 1912, by order of the Senate of the Polytechnic School, Ignacy Mościcki (1867-1946) (Fig. 10) organized the **Department of Physical**



Fig.10. I. Mościcki

Chemistry and Technical Electrochemistry. I. Mościcki, the President of Poland from 1926 to 1939 was a chemist-inventor who founded the Polish chemical industry [1]. Professor Mościcki initiated scientific research on the technology of nitrogen compounds, potassium salts, oil distillation, etc. Since he was a specialist in the technology of inorganic substances, after the death of Professor Pawlewski, he joined both departments and changed its name to the **Department of Chemical Technology I (large inorganic industry) and Technical Electrochemistry**. In 1916, together with supporters, he founded the "Metan" scientific union in Lviv, which was engaged in the development and implementation of inventions in chemical technology. The Union published a journal with the same name (later changed to "Przemysł Chemiczny").

For more thorough training of students in physics, in 1906, at the Faculty of Technical Chemistry, the **Department of Physics II** was opened, headed by Tadeusz Godlewski (1878-1921), the Polish radioactivity research founder. He organized the first laboratory in Poland, which was located in Lviv, for the study of radioactive substances.

In those days, the number of students grew rapidly. So, in the 1904/05 academic year there were 83 chemical students, and in 1912/13 – already 214 [16]. After the women received the right to education, in 1911 the faculty was completed with female students, the number of which was more comparable with other faculties. In the same year, in order to reduce the lack of educational facilities, the second floor of the chemical building was completed. The scientific and educational excursions to operating enterprises were new for students, and this innovation significantly increased their practical training.

The faculty underwent personnel changes. Since 1907, the Department of Botany and Commodity Science was headed by Adam Maurizio (1862-1941), a Swiss botanist, one of the bromatology founders, and the Head of the Department of Mineralogy and Geology was Tadeusz Wiśniowski (1865-1933), a geologist, scientific achievements popularizer, researcher of geology and paleontology of the Carpathians, Podillia, and Kraków regions, author of a number of textbooks [1].

Before World War I, the Faculty of Technical Chemistry had 7 departments and 3 centers for doctoral training. The faculty staff included 7 full professors, 1 extraordinary professor and more than 20 lecturers [16]. The faculty had a number of museums and scientific and educational laboratories, as well as two regional research stations – oil and ceramic (ones). New curricula were developed with a balance between general education, humanitarian, economic and technological disciplines. New disciplines were added, the scope of teaching subjects was changed, and specializations were introduced. The high scientific level of faculty staff was confirmed by the defense of the thesis for a scientific degree by A. Joszt in 1913 and E. Sucharda in 1914, as well as by numerous publications in well-known European journals. Between

1879 and 1918, 140 professional engineering certificates were issued at the Faculty of Technical Chemistry, although the number of students was much larger [9]. In this time, the Polytechnic School became not only the main center for the qualified technical personnel training in Galicia but also a powerful center for the promotion of scientific and technical achievements, new equipment and technologies. Professors and assistant professors, in addition to pedagogical and scientific activities, fruitfully worked on the creation of new industrial enterprises and improvement of existing ones, created scientific and technical societies, schools, and published newspapers and journals.

The heyday of the Polytechnic School was interrupted by the First World War. A significant part of students and teachers were mobilized to the army and a military hospital was placed in the main building. Many professors and assistant professors left Lviv. After the occupation of Lviv by the Russian army, the Polytechnic School stopped its activity. With the retreat of the Russians, the School's work resumed somewhat – students took missed exams, completed projects, and some professors gave lectures.

In the summer of 1919, the Polytechnic School came under the control of the Polish government, which began to reorganize the institution. In 1920, a new Statute was adopted, according to which the name of the institution was changed to "Lviv Polytechnic". The structures and names of faculties were changed. The Faculty of Technical Chemistry was renamed to the **Faculty of Chemistry** and divided into two departments: **Factory Chemists** and **Laboratory Chemists**. A new **Faculty of Agriculture and Forestry** was formed [9], which had common basic disciplines and personnel with the Faculty of Chemistry. Most of the departments were main-

tained, but there was a teaching staff shortage. Julian Tokarski (1883–1961), a well-known geologist, petrographer, and soil scientist, was invited to the Department of Mineralogy and Petrography. Between 1928 and 1934, he also headed the Ceramic Research Station at the Lviv Polytechnic, where he combined research topics with the scientific activities of his department. The **Department of Theory and Design of Machines for Chemical Industry** was founded at the Faculty of Mechanics, which was later planned to be transferred to the Faculty of Chemistry. Witold Broniewski (1880–1939) was appointed the Head of the Department. Manufacturing experts were engaged to give lectures on individual subjects. Thus, the chemical inorganic technology (part I) was taught by the deputy director of the city gas plant E. Piwoński, the former director of the dyeing factory J. Frühling lectured on dyeing materials, and engineer B. Rożański taught the chemical technology of oil and ozokerite.

The number of chemical students increased significantly after the war due to the increase in public interest in the chemical industry products. In the 1920/21 academic year 255 students were trained at the faculty, and in 1922/23 their number was 362 [9]. To solve the lack of lecture rooms problem, the Polytechnic was given the premises of a correctional institution for women named after Mary Magdalena (Fig. 11) (now it is educational building No. 14 on Ustianovicha Street). After the renovation, the dean's office and the Faculty of Agriculture and Forestry and partially the Faculty of Chemistry departments were located there [9].

The formation of new productions in Poland, such as synthetic fibers, dyes, artificial materials, explosives, etc. necessitated the specialists training in those fields. Therefore, in 1923, a new **Department of Chemical Technology III (organic industry)** was opened at the



Fig.11. The building of the women's correctional institution after the transfer to the Polytechnic, 1925.



Fig.12. W. Leśniński

Faculty of Chemistry. It was headed by Wacław Leśniński (1886–1956) (Fig. 12), who was engaged in the synthesis of dyes, artificial materials, and the surface-active substances study. He also developed technologies for processing oil and natural gas.

A long-awaited event was the creation in 1924 of the **Department of Oil and Gas Technology** (renamed in 1933 to Oil and Natural Gas Technology) under the leadership of Stanisław Pilat (1881–1941) (Fig. 13), a well-known scientist in petrochemistry, the Polish oil refining industry organizer. Having headed the department, Professor Pilat attached to it the Regional Research Oil Station, which was renamed as the Oil Technology Laboratory. In the 1930s, S. Pilat formed his scientific school and became a world-renowned specialist in oil refining.



Fig.13. S. Pilat

After the election of I. Mościcki as the President of Poland in 1926, the Department of Chemical Technology and Technical

Electrochemistry was headed by Tadeusz Kuczyński (1890–1945) (Fig. 14). He investigated the separation methods of natural oil emulsions, developed technologies for the processing of Carpathian potash ores, the theory and practice of metals anti-corrosion protection. In the 1930s, he became the Union of Chemical Engineers of Poland co-founder and the initiator of the creation and Editor-in-Chief of the journal "Przegląd Chemiczny". He was also a developer of a new for Poland direction – chemical engineering. In 1928, a laboratory of salt industry technology was organized at the Department with the funds of the Joint-Stock Association of the Exploitation of Potash Salts "TESP". It was headed by Karol Koelichen (1870–1929), a well-known specialist in this field, and the general director of the association at that time. Donat Längauer, who studied potassium salts, after defending his doctoral thesis taught the salt industry chemical technology instead of Professor Kuczyński from the 1933/34 academic year. Later, D. Längauer headed the salt laboratory and became an adviser to the "TESP". During this period, he developed a number of technologies for the Carpathian potash ores processing.



Fig.14. T. Kuczyński

In 1924, the Regional Research Ceramics Station under the leadership of the ever-changing Edmund Krzen was transferred to the Polytechnic. The station's tasks were

the expertise of raw materials for ceramic products and the construction products and materials testing. Students were actively introduced to the work at the station, laboratory and scientific works, as well as diploma projects, were performed there. In addition, E. Krzen taught the discipline "Ceramic materials", and the engineer Y. Modzelewski lectured "Ceramics and cement industry, cement production". It should be noted that the production of ceramics, glass, and building materials in Galicia had long-standing traditions and was quite developed, therefore there was a long-standing need to create a special department for this profile at the Polytechnic. Despite the partial theoretical training of engineers in this field at the Department of Chemical Technology I and Technical Electrochemistry, and practical training at the ceramic station, this was clearly not enough. The special department was organized already after the Second World War.

After the death of Professor Niementowski in 1925, the Department of General and Analytical Chemistry was divided into two independent departments: the Department of Organic Chemistry and Inorganic Chemistry. The teaching of analytical chemistry was also divided – qualitative analysis was transferred to the Department of Inorganic Chemistry, and quantitative analysis – to the Department of Organic Chemistry. Edward Sucharda (1891–1947) (Fig. 15), an organic chemist and researcher of organic heterocyclic compounds synthesis and methods of organic compounds analysis, was appointed the Head of the **Department of Organic Chemistry**. The **Department of Inorganic Chemistry** was headed by Wiktor Jakób (1886–1971) (Fig. 16), an inorganic scientist and the (founder of) the Polish school of coordination chemistry founder. He studied the (processes of) oxidation and reduction processes of complex compounds of Molybdenum, Rhenium, Cobalt, etc.



Fig.15. E. Sucharda

From 1926 to 1934, the Department of Botany and Commodity Science was headed by Dezydery Szymkiewicz (1885–1948), who at the same time headed a similar department at the Faculty of Agriculture and Forestry. Since raw materials of plant and animal origin gradually lost their importance for the chemical industry, from the mid-20s, the volume of botany teaching to chemical students was reduced, and zoology was left only for laboratory chemists. In 1934, the department was closed, although certain disciplines continued to be taught to students.



Fig.16. W. Jakób

In 1927, Adolf Joszt (1889–1957) (Fig. 17) became the Head of the Department of Chemical Technology II and Technical Microbiology. He was a researcher of fermen-



Fig.17. A. Jozst

tation processes, in particular, the catalytic effect of enzymes on the starch decomposition. He also dealt with problems of water technology and wastewater treatment.

In the fall of 1929, the **Department of Physical Chemistry** was finally organized. The senate offered Bogdan Kamieński (1897–1973), associate professor of the Jagiellonian University, to head the Department.

However, he resigned two years later, and from 1934 the Department was headed by Alicja Dorabialska (1897–1975) (Fig. 18), the first female professor at the Lviv Polytechnic. She studied the thermal effects of radiochemical processes, the metals corrosion, the



Fig.18. A. Dorabialska

heat of some elements phase transitions, and participated in research in the field of nuclear energy under the Marie Skłodowska-Curie direction in Paris.

In addition to the described departments, the Department of Physics II belonged to the Faculty of Chemistry, which was headed by Czesław Reczyński (1878–1936) and then by Zygmunt Klemensiewicz.

Since 1934, the Department of Mineralogy and Petrography was headed by Marian Kamieński (1901–1980). He restored the work of the ceramic research station, studied the properties of Volyn kaolins, pottery clays from Glynsk, etc.

The Faculty of Chemistry departments were located in three buildings: the Departments of Organic Chemistry, Inorganic Chemistry, Chemical Technology II, Chemical Technology III were located in the chemical building; the Departments of Physical Chemistry, Oil and Natural Gas Technology, Mineralogy and Petrography, Botany and Commodity Science – in the current building No. 14; the Departments of Chemical Technology I and Technical Electrochemistry and Physics II – in the main building.

Starting from the 1928/29 academic year the division of the faculty into departments (factory and laboratory chemists) was canceled and the chemical engineers training according to different specialties was resumed. The faculty graduated chemical engineers specializing in seven branches of chemical technology: inorganic; organic; processing of agricultural products (fermentation productions); technical electrochemistry; oil, ozokerite and natural gases; salt industry; ceramics and cements.

In the early 1930s, the management of the faculty appealed to the Ministry with a request for the construction of a new technological building, which would make it possible to place heavy equipment and rationally locate all the faculty departments (of the faculty). In this regard, design work on the construction of a building for chemical engineering started in 1936/37. The Ministry reserved

a plot of land with an area of 7.2 hectares at the intersection of the current Chuprinka and Melnyk streets [7].

Before the Second World War, the Faculty of Chemistry included nine departments, a ceramic research station, a salt industry laboratory, a petroleum technology laboratory, etc. The staff consisted of 9 professors, 2 associate professors, 9 teachers, 8 adjuncts, 19 senior and 10 junior assistants, and 3 deputy assistants [17]. They taught a wide range of disciplines, which made it possible to train highly educated engineers not only in various fields of chemistry and chemical technology but also in other technical and social sciences. Chemistry professors also provided teaching of chemical disciplines at other faculties. In the 1938/39 academic year the number of chemical students reached 530, including 51 female students.

The period in the Lviv Polytechnic history, when it became one of the most authoritative universities in Poland, which influenced the formation of the strategy of scientific, technical, economic and cultural development of the state, ended on September 1, 1939. Many professors took an active part in social-political life and played an important role in the revival and development of the Polish state and its economy. In the early 1920s, many professors and specialists moved from Lviv to Warsaw to create new scientific institutions in order to increase the scientific and technical potential of the capital. The Academy of Technical Sciences was founded in Warsaw, and 30 professors of the Lviv Polytechnic became its members [8]. Among the founders of the Academy were professors of the Faculty of Chemistry I. Mościcki, S. Niementowski, W. Syniewski and T. Godlewski, and later S. Pilat and E. Sucharda became corresponding members. In 1925, I. Mościcki initiated the reorganization of the “Metan” union into the Chemical Research Institute and its transfer to Warsaw. Many Lviv Polytechnic professors and associate professors enriched the staff potential of the universities and polytechnics of Lviv, Warsaw, Krakow, Vilnius, Poznań, etc.

Among chemistry professors, I. Mościcki made the greatest contribution to the formation of the chemical industry in Poland: he organized the completion and put into operation a chemical factory in Chorzów, initiated the construction of a number of strategic importance chemical enterprises; contributed to the modernization of Kalush and Stebnyk potash productions. After the formation of independent Poland, S. Pilat laid the organizational basis for the creation of the oil industry. Later, he managed large enterprises in this field, in particular, the Drohobych Oil Refinery “Polmin”, designed new oil refineries, gas pipelines and participated in their construction. A significant contribution to chemical science and education was made by T. Kuczyński, who developed a new direction in pre-war Poland – chemical engineering, and founded the Union of Chemical Engineers of Poland.

Polytechnic chemists had big plans for the future. However, history developed in its own way, on which difficult tests awaited the Polytechnic.

CONCLUSIONS

The establishment of the Department of Chemical Technology and the School of Technical Chemistry in the Lviv Technical Academy 150 years ago marked the beginning of the qualified chemical engineers training for the chemical and related industries of Galicia and other states, highly educated scientists and teachers. During this period, thorough and diverse scientific research was carried out at the School, many world-class discoveries and developments were made, and many textbooks, monographs, and scientific works were written. R. Günsberg, B. Pawlewski, I. Mościcki, T. Kuczyński made a significant contribution to the development of chemical technology, A. Freund and S. Niementowski – to the organic chemistry, R. Zalozetskyi and S. Pilat – to oil refining. Chemistry professors contributed to the economic and cultural development of Galicia, they worked on the new enterprises creation, were engaged in solving technical issues of Lviv and the Lviv region, created scientific and technical societies and schools, published newspapers and journals.

Curricula for chemical engineers training contained balanced volumes of general education, technological, humanitarian, and economic disciplines, a significant volume of laboratory and project works. The educational process was provided with lecture rooms, devices and apparatus, laboratories and museums. The activities of the research oil and ceramic stations, the salt laboratory made it possible to update scientific research, to attract students to them, and due to this, raise the level of their practical training.

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