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CRISTEA NICULESCU-OTIN, THE FIRST RECTOR OF THE ”GHEORGHE ASACHI” POLYTECHNIC SCHOOL OF IAȘI

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University Professor Cristea Niculescu-Otin, with a solid training in chemical engineering, had a major contribution to the foundation and development of the chemical engineering education at “Gheorghe Asachi” University and Polytechnic School of Iași. His name remains in the history of the local and national education for his important work related to the establishment of the superior technical school in the capital of Moldavia, whose first rector he was between 1938 and 1944. Alongwith the didactic activity and his preoccupation for the organization of the laboratories necessary for a proper development of the educational process, Professor Otin also performed a remarkable research activity, especially in the field of Technological Chemistry.

Keywords: life, chemistry, education, engineering, scientific research

The name of Professor PhD. Cristea Niculescu-Otin is a benchmark for local chemical engineering education at “Alexandru Ioan Cuza” University and “Gheorghe Asachi” Polytechnic School of Iași, a name that remains in the history of Romanian education. His fundamental work and contribution to the founding of the technical higher school in Moldavia's capital was materialized in 1937, through the legal establishment of “Gheorghe Asachi” Polytechnic School, whose first rector he was between 1938–1944. [1]

1. PROFESSIONAL TRAINING AND ACADEMIC CAREER

Born in Ploiești, on December 5, 1879 (birth certificate no. 1370 of December 5, 1879, Civil Status Registry at the City Hall of Ploiești), in the family of Anica and Nicolae Fotache, the renowned professor had initially the name of Nicolae Fotache Hristache. The reasons why, as a young man, Nicolae

Fotache demands to legally change his name into Cristea Otin[1], as he was known and with that he used to sign documents along his entire life, remains unknown [2].

In 1898, Cristea Niculescu-Otin graduated the prestigious "St. Petru and Pavel" high school in his hometown, and then served within Infantry Regiments no. 6 and 7. Starting with 1900, he becomes a student in the Department of Physical-Chemical Sciences at the University of Bucharest and, after obtaining his bachelor's degree diploma in 1904, C. Otin becomes a grant holder of the *Adamachi Fund* and goes to study at the famous Technical University of Charlottenburg, for the period 1906 – 1910. [1] In 1911, he also obtains the title of PhD in Engineering at the same university, with the thesis entitled *Contributions to the knowledge of oxidation products electrochemically obtained from bismuth*. Otin returns to Romania and, in 1913, becomes docent in Technological Chemistry at the University of Bucharest. For a short period of time, during the school year 1912-1913, he was a secondary professor at the Military High school of Dealu Monastery, Târgoviște [3].

Starting with 1913, following the address of the Ministry of Instruction no.89397/December 3, 1913 [4], Otin settles in Iași, being named substitute teacher at the Department of Technological Chemistry within the Faculty of Sciences at the University of Iași. The new building of the University was inaugurated on October 21, 1897. [5] Likewise, the same address of the Ministry of Instruction appoints Otin organizer and director of the *Department of Industrial Chemistry* within the University of Iași. By that time, the Faculty of Sciences included: the department of Mathematical Sciences, the department of Physical-Chemical Sciences, the department of Natural Sciences and the department of Applied Sciences.

Through this first step taken at the beginning of his academic career, the life of Cristea Otin will be for ever connected to the city of Iași, mainly by his essential contributions to the organization of higher technological chemistry education. At that time, at the University of Iași, there was taught a class of (inorganic and organic) Technological Chemistry [6], introduced in 1911 by professor Anastasie Obregia, who also organized the first laboratory of technological chemistry, endowed with modern equipments. The students attending this class received specialization certificates, as evidenced in their bachelor's degree diploma. [7] Cristea Otin becomes the successor of professor Anastasie Obreja, lecturer of the Organic Chemistry course, teaching aspects of Technological Chemistry and carrying on the organization of the *Laboratory of Technological Chemistry*, whose director he becomes starting with 1915.

[1] In the meeting of the Council of Ministers of February 13, 1920, pursuant to article 12 of the law, Cristea Nicolae Fotache, also called Nicolae Otin, was approved to change his patronymic name of Nicolae into that of Otin, to be named Cristea Otin, as recorded on June 26, 1920 on the birth certificate in the Civil Registry for newly borns, found at the National Archive of Prahova.

Postal card-University Palace of Copou, around 1900

Professors Anastasie Obregia and Cristea N. Otin, Iași, around 1930 (collection of the "P.Poni-Radu Cernătescu" Museum, Iași)

Following the reorganization of the department of Applied Sciences at the Faculty of Sciences, starting with 1913, *The Department of Applied Chemistry* issues three-year bachelor's degree diplomas. The three-year studies were devoted to Mineral Chemistry, Organic Chemistry, Optical Physics, and Inorganic Chemistry. The class of Technological Chemistry of professor C. N. Otin had a two-year duration. The curricula equally included the following subjects: Chemical Technology and Machines and Installations in the Chemical Industry, also lectured by Otin. [7]

After two years, on July 1st, 1945, following the fulfilment of the conditions imposed by the law and after passing a promotion exam, C. N. Otin obtains the title of aggregated professor, and of director of the Technological Chemistry Department. [8] In 1915, the University of Iași included three departments of Applied Sciences: Electrotechnics, Agricultural Chemistry and Technological Chemistry, the directors of the three departments being in charge with the establishment of their operating regulations. [7] According to the Regulation of the Chemistry Department, Otin was the coordinator of the courses of General Technological Chemistry, Special Technological Chemistry, Chemical Industrial Machines and Their Technology, Notions of Factory Constructions, as well as of projects and laboratory works performed by students. [7] The graduating students had the obligation to perform a two-month practical stage in industrial enterprises, and the bachelor's diploma mentioned the specialization of chemist engineer. In 1916, only two persons had a degree in Applied Chemistry, specialty Technological Chemistry: Gheorghe Alexa (1891-1985) and Gheorghe Huidovici (1891–1954), both of them delievering courses within the respective departments, where they were professors their entire lives.

2. THE ACADEMIC TECHNICAL EDUCATION AT THE UNIVERSITY OF IAȘI

Entering the war on the side of the Entente, starting with August 14, 1916, fully impacted the students and the entire staff of the University of Iași, who were forced to go through the difficulties and deep shortcomings caused by the war, in every aspect of life. Thus, in order to support the production of food necessary for the hard living conditions of that time, in March 1917, professor Cristea Otin, a captain in reserve, requests the rector of the University, Prof. Matei B. Cantacuzino (1855–1925), the allocation of a "500 square meter area near the Laboratory of Technological Chemistry, which will be worked on during free hours by the laboratory's servants for the production of some greenery, a part of which will benefit the staff, and the remaining will be made available to the institution". The rector approves the report drawn up by Professor Otin and the destination is allocated. [9]

After a two-year interruption of the activity at the University of Iași, the education process is resumed with great efforts, on March 1, 1919. The University premises housed the headquarters of the Ministry of War, transferred to Iași, and the building, the lecture halls, the laboratories, the furniture, the libraries were all largely damaged during this period, requiring urgent repairs. [10] Restoration of the University premises and the repairs were hampered by the lack of funds. As a result of this difficult situation generated by the consequences of war, the most affected were the students who, most of them being mobilized, had not showed up for exams since June 1916. The high school graduates of the years 1914 and 1915 summoned for military training enrolled at the University starting with the summer of 1918, asking for their demobilization.

Given the special circumstances of the fall of 1918, and in order to support the students, the University Senate requests the Prime Minister, General Constantin Coandă (1857-1932), that the students "who are part of the reserve staff, regardless of the unit in which they are listed, to be considered as mobilized at the University where, under the control of the Deans, they will be rigorously obliged to attend the respective courses, laboratories and seminars". [9] Reopening of the courses for the academic year 1918–1919 is continuously postponed by the lack of material necessary for the operation of laboratories and amphitheatres, the students insisting on the resumption of studies through memos addressed to the university management. The incorporated students appeal to the Rector and the University Senate to make the necessary steps towards the Ministry of War to be demobilized for continuing their studies. [11] Finally, the university courses begin on March 1, 1919 [10], the total number of re-enrolled and newly enrolled students for the Electrotechnical, Technological Chemistry and Agricultural Chemistry sections being of 395 [12].

In the academic year 1918–1919, at the Faculty of Sciences of Iași, PhD. Eng. Cristea N. Otin was head of the Technological Chemistry, Electrochemistry and

Electrometallurgy course, and Gheorghe Alexa – teaching fellow. [13] Prof. Otin's two-year course dealt with aspects of water technology, heat and cold sources, inorganic and petroleum industry, chemical fertilizers, tannery, paper, explosives, glass, mortar, acids, bases, offering "our graduates the possibility to acquire all the necessary knowledge and to familiarize themselves as much as possible with industrial issues" [13]. Within the laboratory, equipped with all necessary materials for practical work, attention was paid to "small tests of everything related to large manufacturing, such as: industry of acids (sulphuric, nitric, hydrochloric acid), bases (sodium carbonate, caustic soda). Working of ceramics, glass, cement, lime, with the testing of materials: tannery, soap, sugar, paper and oil, will occupy a leading place in this laboratory".[13] For Professor Otin, the laboratory and the industrial technical installations represented the place and the working tool for the research of scientific truth. In the laboratory, future students had to be trained in the spirit of inquiry, learn the methods of investigation and discipline their intellect. By changing and supplementing the operating regulations of the Chemical Sciences Department with order No. 4.236/September 8, 1923, the duration of studies becomes of four years and the industrial practice of students of three months. At the end of the studies, a diploma with the specialization of chemical engineer was issued [7].

Over the period 1918–1923, there were eight graduates as chemical engineers, between 1923 and 1932, 53 chemical engineers, and between 1932–1935, a number of 49 graduates obtained the title of university chemical engineers; subsequently, all of them were employed in industry. [7] Starting with the academic year 1927–1928, Cristea Otin also took over, as a substitute lecturer, the discipline of Technology, mechanics, machines and industrial installations within the Department of Electrical Chemistry and Electrometallurgy. [14] After the establishment, in 1937, of "Gheorghe Asachi" Polytechnic School, Otin was recruited and appointed permanent professor at the Polytechnic School within the department of Inorganic Technological Chemistry, where he taught 3 hours/week technological chemistry, the laboratories being assured 6 sessions/week, four hours each.

3. THE FOUNDATION OF "GHEORGHE ASACHI" POLYTECHNIC SCHOOL OF IAȘI

Following the development of the technical education across Europe after the First World War, the idea of expanding the academic technical schools for training the specialists so necessary for the economic development of the country and for having a higher number of engineers becomes increasingly present in Romania. Essential issues, such as the lack of spaces for the foundation of new chairs, of laboratories or specialized libraries, imposed the allocation of substantial financial grants from the State, capable of assuring a proper conduct of the educational

process. A last step was taken by the University Senate, during the mandate of Rector Alexandru Slătineanu (1873–1939), in its meeting held on October 24, 1924, during which the Council of the Faculty of Sciences decided that this structure will be reorganized as two separate units, the Faculty of Sciences and the Technical Faculty, which would include Technological Chemistry, Agricultural Chemistry and Electrical Engineering. The decision taken by the University Senate was submitted to the Ministry of Instruction [15].

Also, on December 20, 1926, the meeting of the University Senate decided the separation of the existing applied departments and the establishment of a new faculty, The Faculty of Applied Sciences, or to create research institutes, separated from the University of Iași, based on the legislation and regulations in force. Due to the tenacity and determination of renowned university professors from the two institutes within the Faculty of Sciences, having as promoters Cristea Niculescu-Otin, Ștefan Procopiu, Haralamb Vasiliu, Nicolae Costăchescu, Radu Cernătescu, C.V. Gheorghiu, Ion Plăcințeanu, this desideratum is accomplished. All these university professors have firmly advocated for years for the foundation and organization of the so much desired Polytechnic School, being convinced that such a higher technical education in the region of Moldavia was necessary to function and to be independent [16].

The Official Gazette no. 66/ March 20, 1937 published the law for "the concentration of engineers' training in polytechnic schools" [17], which dissolved the higher technical education. On April 6, 1937 [18], the teaching council of the Applied Sciences departments within the Faculty of Sciences "declares the Polytechnic of Iași formed, with the departments and conferences whose classes were attended by the students of Applied Sciences departments" [17]. The name of "Gheorghe Asachi" Polytechnic School is attributed in the memory of the first Moldavian engineer who introduced technical education in Moldavia. On June 11, 1937, the University Council decides that the memoir drafted by prof. Cristea Otin regarding the "promulgation of the law for the establishment of «Gheorghe Asachi Polytechnic School» of Iași to be submitted for approval to the Ministry of National Education" [19].

For the development of the technical education process, in the meeting of University Senate of September 24, 1937, prof. Petru Bogdan (1873–1944), dean of the Faculty of Science, notifies that he would make available to the new higher education institution "the teaching staff and the necessary laboratories, without giving up the chairs and the laboratories". [20] Thus, a collaboration and functioning agreement signed by Petru Bogdan and Cristea Otin is concluded between the University and the Polytechnic School on December 22, 1937, for carrying on teaching activities and several regulations. [21] According to this agreement, the teaching staff, the auxiliary staff and the laboratories of the Faculty of Sciences remained at the University, the classes and the laboratory works being common for the students of the two education units. All taxes were collected by the

Rectorate of the Polytechnic School, the bookkeeping of income was done in double entry ledgers and "will be credited to the University Rectorate, at request, from the income, taxes related to construction, library and 75% of the registration fee". [21] With regard to student discipline and student associations, they had the obligation to comply with the legal provisions and student regulations, the University Rectorate having the authority granted by the laws and the regulations for the students of the Polytechnic school. The societies of Polytechnic students were to be controlled by the Rector of the Polytechnic School [21].

Another historical moment to be mentioned was on October 9, 1937, when the Senate of the University of Iași receives the decision of the Ministry of National Education concerning "the postponement of the functioning of the Polytechnic School until the legal and material conditions will be achieved". [20] However, according to decision no. 205330/3.12.1937 of the same Ministry, published in the Official Gazette no. 284/8.12.1937, the new higher education institution: "Gheorghe Asachi" Polytechnic School is established, and the two technical-applicative departments, Electrical Engineering and Industrial Chemistry, become faculties with a four-year duration of studies, entitled to issue bachelor's degree diplomas. Also, the Faculty of Agricultural Science within the University was transferred to the Polytechnic School, being now called The Faculty of Agronomy [12], headquartered in Chișinau. To meet the modern requirements, the two faculties were allocated adequate spaces in the new wing of the Mihăileană University [22], built on Copou Hill between 1929–1933, during the Rectorate of professor Petru Bogdan.

The regulation of the Polytechnic School of Iași is approved by the Royal High Decree no.1089/1938 [23]; following the report of the Ministry of Education, HM The King approves by Royal High Decree no.1278/1938 the appointment of PhD. Prof. Eng. Otin Cristea as Rector of the Polytechnic School of Iași, for a period of three years, starting with March 15, 1938 [23]. The appointment of Otin follows the proposition and the choice made by the Council for the Training and Teaching Council of the newly founded Polytechnic School, in recognition of his merits and qualities of teacher, educator, researcher and very good organizer.

In fact, functioning of the Polytechnic School starts on October 1, 1938, the official inauguration of the institution and the solemn opening of the academic year 1939-1940 taking place on October 10, 1939 in the Aula Mihăileană of the University. [24] In his inauguration speech, Cristea Otin, Rector of the Polytechnic School of Iași, addresses to the students encouraging them to arcquire a good professional education obtained through hard work, dignity and confidence in their future careers. "Any young man must know and strongly believe that, as long as he is a student, he should do nothing else than study, listen, prepare, gain as much knowledge as possible and enrich his soul with as many beautiful qualities as possible. The student must be deaf to everything that is not school, without becoming unilateral. To read, to assimilate, to gain a beautiful general culture and increase as much and as varied as possible the luggage of useful knowledge, which will serve him in his career, in his life. But, what

But, what our students should not forget is that they should be total strangers to political preoccupations, keeping a distance as far away as possible from them. They should not be seduced by the deceitful mermaid-like voice that the politicians use to tempt their followers, without a conscience and without scruples" [24].

The festive meeting was broadcasted for the first time by the radio broadcasting network of the Mihăileană University, installed in the Radio Department by physicists professors Alexandru Cișman (1897–1967) and Ștefan Procopiu. The antenna of the station was of Zeppelin type, erected on the roof of the University at a height of 16 m.

The Teaching Council aimed at establishing and organizing new chairs and laboratories, corresponding to a modern educational process, as well as all necessary means for the teaching staff, according to modern university standards. The necessary funds for the establishment of six new chairs are allocated in the budget for the school year 1939–1940 [22], by the involvement of the renowned local professor Petre Andrei, Minister of National Education between 1938 and 1940. The students of the Institutes of Electrical Engineering and Industrial Chemistry who used to develop their activities at the University were transferred to the new Polytechnic, so that the first promotion of engineers graduated in the fall of 1940.

As a rector, C. N. Otin takes the necessary steps to build up the premises intended for the Polytechnic Palace, also located on Copou Hill, which will be "decorated like a precious jewel in the former capital of Stephen the Great's Moldavia" [24]. In this endeavour, he is supported by PhD. Ion Tănăsescu – rector of the University of Iași, by General C. Ionescu – mayor of the city of Iași and, in particular, by Minister Petre Andrei, who encouraged both morally and materially the establishment of the new Polytechnic. The foundation stone was laid on June 2, 1940, on Toma Cozma street, in the place where the building of the Normal School for Girls had been abandoned. [24]

Cristea N. Otin, Ștefan Procopiu and Alexandru Cișman, 1939, Iași (archive of the "Ștefan Procopiu" Science and Technique Museum of Iași)

For the smooth operation of the University from its first years, in addition to the funds allocated from the State, the Polytechnic was supported financially, through material donations, by a number of industrial and banking institutions, as

well as by individual persons, who understood the need of a new academic establishment in Iași [24]. Among them, mention should be made of the IInd Air Region, the National Bank, the Electric Plant of Iași, the City Hall of Iași, Reșița Plants and Domains, Turda Wire Industry, the Aeronautical Service, "Țesătura" Factory of Iași, the Industrial Spirits Union, Socola Iași, engineer I. Solomon Iasi, industrialist G.J. Duqué, engineer George Morariu.

At the beginning of 1938, Professor Otin donated 20,000 lei to the Polytechnics, in annuity titles [25]. In the following year, from his savings, Otin created a fund of 1,000,000 lei, stipulating that "out of the income, two scholarships should be awarded to poor but deserving students from the Polytechnics of Iași: one being intended for the section of Chemistry, the other of Electricity". [26] The two scholarships, of 1,500 lei per month each, were for the entire academic year. By establishing these scholarships, Otin wants to be useful to young people without material means, facilitating their access to studies for a thorough training, for creating a career to the benefit of their country.

In his act of donation, the renowned professor Otin stipulates that, through these scholarships, he intends "to stimulate, on one hand, the feeling of helping future citizens, who have created situations for themselves due to the possibility of a scholarship and, on the other, to strengthen the sense of personal dignity, each scholarship holder considering himself only as the holder of a loan of honour, and by no means of a gratuity aid; I understand that the scholarships established by me will be reimbursable over 10 years, in equal instalments, starting one year after the former scholarship holder will have made a profit by exercising the knowledge gained, or occupying a position indicated by the studies he completed" [26]. Another part of the money was intended for a prize that had to be awarded every four years, consisting of a study trip abroad, for a student recommended by the board of the Polytechnics.

The years of the Second World War were marked by the transfer of the Polytechnics to Chernivtsi, as stipulated by Decree Law No. 2847 published in MO No. 247/20 October 1941 [27]. Coordination of this extensive activity rests with the rector Otin, who undertook what was necessary for the arrangement of the new premises, of the laboratories and dormitories in Chernivtsi, packing in boxes and transportation in wagons of all furniture, devices and laboratory installations between Iași and Chernivtsi. Once again, the unfortunate circumstances of the war led to the evacuation in March 1944 of the entire material base, as well as of the teaching, administrative staff and students, by moving from Chernivtsi to Turnu-Severin [12].

The academic activity of the renowned professor Cristea Niculescu-Otin ends in the fall of 1944, through his retirement [12].

4. THE SCIENTIFIC ACTIVITY OF PROFESSOR CRISTEA NICULESCU-OTIN

Alongwith his teaching activity and concern for the organization of the laboratories necessary for a smooth running of the educational process, Professor Otin also carried out a remarkable research activity, especially in the field of technological chemistry. In 1913, he performed the first archeometric study in Romania regarding the compositional analysis of some archaeological bronze artefacts, entitled *Contributions to copper metallurgy in the lands occupied today by Romanians*, published in the Bulletin of the Romanian Academy.

The main aspects of the professional activity of associate professor C.N. Otin are provided in a detailed report drawn up by the scientific council of the Faculty of Sciences, presented at the University Senate meeting on July 18, 1918 by Petru Bogdan, on the occasion of granting to him the rank of full professor, in accordance with the Secondary and Higher Education Law. [28] The members present at the Senate meeting were: rector Nicolae Leon – president, Vasile Negel – delegate of the Faculty of Medicine, Ilie Bărbulescu – delegate of the Faculty of Letters, Iulian Teodorescu – delegate of the Faculty of Law, Petru Bogdan – delegate of the Faculty of Sciences and Constantin Parhon – delegate of the Faculty of Medicine.

The report prepared by the commission on the professional activity of Prof. PhD. Eng. Otin mentions that ”upon entering the faculty he revealed himself in a favorable light, which enables us to put a lot of hope in him for the future, both through his teaching and investigative skills, fuelled deeply by a solid scientific training, with eloquent creative tendencies, as well as through the perseverance to impress upon students the love for this complex branch of the positive sciences, the serene love of the scientist, which is sincere and therefore communicative from teacher to student, constituting one of the most fruitful and conquering educational forces” [28].

Without asking for funds from the State, professor C. Otin managed through his own perseverance to improve the endowment of the Technological Chemistry laboratory with devices and materials, worth about 50,000 lei. During the war, the laboratory rendered valuable assistance to the Army Geographical Service, identifying and preparing a foreign patented product, without which the execution of the War Maps would have been impossible [28].

Methodical, scientifically rigorous and devoted to the research of applied sciences, Cristea Otin is the author of one of the most important specialized works on natural deposits, devoted to the chemical-technical study of asphalt deposits in Matița, Prahova county. Thus, a first article is published in *Annales scientifiques de l'Université de Iassy*, Tome IX, 1915, pg.138–169, followed by a second, more extensive one, issued in *Bulletin Scientifique de l'Academie Roumaine*, Volume 5, 1916: S*ur les produits obtenus par la distilation seche de l'asphalte de Matița* (“On the products obtained by dry distillation of asphalt

from Matița") [28]. Professor Otin's study had a special scientific and economic significance for Romania, the author dealing with the products obtained by dry distillation, establishing the economic value of these deposits (over 40 million lei – amount reported in 1918) and putting them into evidence, while also discussing the genesis of asphalt deposits, in relation to those of oil. Through rigorous chemical-analytical methods, Otin establishes that the natural generation of asphalt from petroleum is due to "its oxidation in contact with the atmospheric air and in the presence of clay-siliceous rocks", the research, as a whole, making a valuable contribution to the investigation of bitumen in relation to that of oil.

As an expert in the chemical industry which was fully developing across Europe, Professor Otin brings into attention and emphasizes the importance of the relation between theoretical and practical research, by creating the conditions for the application, in the factory, of the skills necessary for the industrial development of the country. Also, Otin supported the Romanian manufacture based on its own raw materials, for chemical fertilizers, dyes and explosive substances, following the process of oil distillation and extraction of aromatic hydrocarbons. In this way, Romania would no longer be dependent on imported products, developing its own domestic chemical industry. In order to support the development of this modern industrial branch, rector Otin established in Iași an anonymous company for training specialists and young entrepreneurs, whose purpose was:

"1) to establish various new industries such as: tannery, soap factories, greases, chemical products, etc.;
2) to instil in young men the interest for industrial structures, by helping them initiate enterprises of this type;
3) to equally establish a practical school for the foremen needed by the chemical industries" [28].

Cristea Otin published more than 35 original articles [14] and studies in magazines from both Romania and abroad, on the topic of Matița asphalt, grape seed oil, cracking of lamp oil at ordinary pressure with catalysts, cracking of paraffin, as well as studies on resinous tanning substances, the influence of temperature on single-bath chrome tanning, the physical-chemical study of spruce bark of Romania from the perspective of tanning materials, etc.

He was a member of the Academy of Sciences of Romania, president of the Chemical Society of Romania (1929–1932), member of the International Association of Tannery Chemists, member of the German Chemistry Society. [1] Professor Cristea Niculescu-Otin is a pioneer in the modern chemical engineering education of Iași, whose work, tenacity, qualification, solid instruction, but also the vocation with which he served for decades in this field, played an essential role in the foundation of the prestigious polytechnic institution. A visionary spirit, persevering and dedicated to the technical progress all his life, Otin put above all

the love for the nation, the country and the King, for the young people who, embracing the career of an engineer "will not waste even the smallest trace of their work and knowledge, for anything else that is not for the public benefit and for the good and happiness of their fellows." [24]

Cristea Otin[2] died on June 20, 1953. [2] He dedicated his entire life to the development of chemical education in Iași, his deeds being reflected in the promotion of this elite institution of the Romanian academic science and environment.

5. SELECTION FROM THE PUBLICATIONS OF PROF. PhD. ENG. CRISTEA NICULESCU-OTIN

1. *Über Schmelzen von Kupferoxydol mit Kieselsäure*, in Metallurgie, IX, Heft 3, 1911;
2. *Silicații sintetici de Bismut* ("Synthetic Bismuth Silicates"), in Bulletin de la Section Scientifique de l'Academie Roumaine, 4 (1913);
3. *Contribuțiuni la metalurgia cuprului în țerile ocupate azi de Români* ("Contributions to copper metallurgy in the lands occupied today by the Romanians"), in Bulletin de la Section Scientifique de l'Academie Roumaine, 6 (1913);
4. *Nouvelle contribution à la Metallurgie de Cuivre au temps de Roumains dans les pays qu'habitent actuellement les roumains*, in Annales Scientifiques de l'Universite de Iassy, 8 (1914);
5. *Étude chimico-technique de l'asphalte de Matitza*, in Annales Scientifiques de l'Universite de Iassy, 9 (1915);
6. *Produits de l'asphalte de Matitza*, in Bulletin de la Section Scientifique de l'Academie Roumaine, 5 (1916);
7. *Chemich Technische Untersuhungen Über Die Aus Traubenkernen Ausgenen Oele Verschiedener Weigegender Rumäniens*, (in colab. with M. Dima), in Allgemeine Oel-und Fett-Zeitung, 1933, Heft 2. p.71–77 și Heft 3, p.135–144;
8. *Krackversuche mit rumänicshen Leuchtöl*, in Petroleum, XXXIII Band Nr.12, S 1–7, 1936;
9. *Contribution a I'etude tannage dans le vid*, in Journal of the International Society Soc. Leather Trades' Chemists, July, 1937;
10. *Contribution a I'etude du tannage combine Alumine-tanin*, (in colab. with Gh. Alexa), in Journal of the International Society of Leather Trades' Chemists, 22, 1938;
11. *Über die Spaltung des Leuchtols durch Katalyse*, (in colab. with S. Savencu), in Petroleum, No. 46, pp. 1–5 și No. 47, pp. 1–5, November 1938;

[2] He was married to Mrs. Jeana Mihăilescu Popa between June 7, 1943 – April 12, 1952.

12. *Untersuchungen der rumänischen Gasanstaltteers*, in Montanistische Rundschau, No. 5, pp. 2–12, 1939 (in collab. with S. Savencu);
13. *Essais d'aromatisation de la paraffine sous I'action du chlorure d'aluminium*, (in colab. with M. Dima), in Chimie et Industrie, T. 40, No. 2, pp. 217–227, August 1938.

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4. ***http://www.muzeul.uaic.ro/public/images/anuare/Anuarul_Universităţii_din_Iasi_1930–1935.pdf, p. 82–83.
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