

# LEO SZILÁRD'S STUDIES AT THE PALATINE JOSEPH TECHNICAL UNIVERSITY OF BUDAPEST

F. SZABADVÁRY

Department of General and Analytical Chemistry,  
Technical University, H-1521 Budapest

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## Abstract

Leo Szilárd (1898–1964), the famous atomic scientist, one of the constructors of the first nuclear reactor (1942) studied at the Palatine Joseph Technical University in the period of 1916–1920. The paper reports on his studies and on the examinations he had taken.

The name and scientific achievements of Szilárd are generally known, there is no need to report them here. They are included in every encyclopaedia. It is also known that he was born in Budapest in 1898, he started from here to reach the highest regions of atomic science first in Germany, later in the United States. He also came in touch for a moment with world history. Only for a moment, this moment being, however, a tragic turning point in the history of mankind. He was the one, who after the successful splitting of the uranium atom by Hahn and Strassmann in Berlin (1938) recognized that this is the key to realizing chain reactions and liberating atomic energy.

He was the one who convinced Einstein, whom he had known from Germany, to write his famous letter to President Roosevelt in which he pointed out the possibility of making an atomic bomb, a statement which led to immediate starting of research. In this letter, the name of Szilárd is twice mentioned, who in collaboration with Fermi, realized later in Chicago the first operating nuclear reactor in 1942.

Later on, the same Szilárd, frightened by the genie let out of the bottle, unsuccessfully tried to warn President Truman from dropping the atomic bomb on a populated area.

He played an outstanding role in different movements against nuclear bombs and nuclear war till his death in 1964.

All this has already been reported in a number of books of both fiction and science.

However, only hints, if something at all can be found in them concerning his studies in Budapest.

Leo Szilárd, the son of a wealthy Hungarian engineer was admitted in 1916 to the Faculty of Mechanical Engineering of the Palatine Joseph Technical University of Budapest, which was founded in 1782. His results are contained in the XXVI. register of students, page 255. In what follows, data found in this register will be reported.

Explanations: Roman numerals I and II mean that the professor signed his lecture book proving that he attended this course in the first and second semester.

Arabic numerals stand for the marks of examinations. If there are two numerals, the first one is the grade in theory, the second one is the grade in practice of the same subject.

At that time the best grade was 6, the worst one was 1.

Let the class register follow:

“Leo Szilárd, born in Budapest, religion: Israelitic Calvinist\* was admitted as a regular student of the Faculty of Mechanical Engineering in January 1916/17 on the basis of a regular lecture book.”

(The word “Israelitic” was erased in the class register and corrected for “Calvinist”. Under the asterisk the following footnote is to be found: “According to the Vol. II, p. 14 of the baptismal register of the Reform Church in district VI–VII of Budapest, Leo Szilárd converted to the Calvinistic religion on July 24, 1919.”)

Budapest, December 14, 1919.

Hermann  
Dean”

Courses attended and results achieved:

“1916/17

Analysis and geometry II 6

Projective geometry II 5, 5

Chemistry 6

Drawing II 6, 4

Strength experiments II

General mechanics

1917/18

Analysis and geometry I, II

Mechanics I, II 5, 6 July 1, 1919

Chemical technology I 4 December 13, 1918

Physics I, II 6 January 22, 1919

Mechanical drawing I 6, 5 July 4, 1919

Casting and forming of metals II 4 July 1, 1919  
 Workshop practice I, II  
 Electrotechnics I, II 3 February 19, 1919  
 Electrical measurements I  
 Machine elements I, II  
 Steel structures II

He passed the first final examination with a good result

Hermann

1918/19

Steel structures I, II  
 Machine elements I, II  
 Cutting of metals and wood I  
 Hydraulic machines, compressors and steam turbines I, II  
 Elements of geodesy II  
 Spinning and weaving of fibrous materials II  
 Cranes and elevators II  
 Encyclopaedia of construction II 5  
 Workshop practice I, II  
 Mechanical technology II, I, II  
 Electric batteries  
 Electric practice

Leaving certificate issued November 20, 1920.”

Interestingly, Szilárd was admitted also to the Faculty of Civil Engineering for the academic year 1916/17 (Register XXIX, page 14), he took the courses of the first semester but did not pass any examination. Since in the first semester the same professors lectured at both faculties in numerous subjects, supposedly first he wanted to become a civil engineer and changed for the Faculty of Mechanical Engineering only at the end of the first semester, hence the registration to this faculty only in January.

At the Palatine Joseph Technical University the curriculum was fixed. The students had to pass examinations at the end of terms and after that also final examinations.

At that time, three final examinations were needed for getting a diploma at the Faculty of Mechanical Engineering. Szilárd passed the first of these which involved mathematics (analysis and geometry) and mechanics. Due to the world war, the university studies were easier at that time: students could pass their exams later, semesters were shorter, even contracted semesters were

possible for students being in military service. Subjects marked by dates mean that the examinations were taken later.

Szilárd might have entered military service in 1917–18. He supposedly volunteered since he was under military age. People who finished secondary school could directly go to officer's school after a shorter time of service. Szilárd probably attended such a school at the end of the war, and he returned to his studies.

His leaving Hungary may find an explanation in political developments. A strong polarization was to be observed among the students at Hungarian universities already since the beginning of the century, and they often lead to conflicts. There was a liberal radical tendency close to marxism and an antagonistic, national tendency.

The Austro-Hungarian Monarchy disintegrated in October, 1918. Hungary became a bourgeois democratic republic, and in March, 1919, the united communist and social democratic party took over, and the Hungarian Soviet Republic was proclaimed. In the meantime, Czech, Serbian and Rumanian troops invaded the country, in one part there was French occupation, where counter-revolutionary troops were organized. The offensive of the Rumanian troops toward Budapest began July 24, 1919. The Revolutionary Government directing the soviet republic resigned August 1, its leader left the country. August 4 the Rumanian troops marched into Budapest, and they left November 16.

Instead, the counter-revolutionary, so-called national army entered under the leadership of Admiral Horthy and he formed a national government. The change of situation let his effect felt also at the universities. Since there were numerous Jews among the leaders of the soviet republic, after its fall an antisemitic wave appeared in the country, especially at the universities. This prompted many students to continue their studies abroad. Many young instructors chose the same way. Then and due to this, Hungary lost many of its talented sons who later became world-reknown scientists, such as Gy. Hevesy, T. Kármán, J. Wigner, J. Neumann, E. Teller and L. Szilárd.

It is an open question, however, whether their achievements would have been as outstanding if they had remained in very poor, post-war Hungary.

Prof. Dr. Ferenc SZABADVÁRY H-1521 Budapest