

Gathering Experience Abroad

The study-tours of students and teachers from the Technical University of Budapest 1899–1914

ATTILA SZILÁRD TAR

Abstract. The Technical University of Budapest was a young institution by the end of the 19th century. It was officially founded in 1871, even though it had appeared in some forms from the 1840s. The Hungarian technical schools looked to copy the German model. To accomplish this they needed information about this type of higher education. Through studying the historical records it is possible to detect several forms of information-collection, which can be seen as forms of communication.

Získávání zkušeností ze zahraničí. Studijní cesty studentů a vyučujících z Technické univerzity v Budapešti v letech 1899–1914. Budapešťská technika byl na konci 19. století mladá instituce. Oficiálně byla otevřena v roce 1871, i když jistou prehistorii měla už od 40. let 19. století. Maďarské technické školství se co do vzorů shlíželo v německém modelu. K tomu ale potřebovalo informace o tomto typu vyššího vzdělání. V historických záznamech je možné vypátrat několik cest sbírání informací, které mohou být spatřovány jako jistá forma komunikace.

Introduction

The necessity of the establishment of a technical university was debated in Hungary in the Reform Age following 1830 and 1848. Some results could be detected, such as the Trade School (Ipartanoda) founded in the 1840s or the Polytechnical School established in 1857. These were the forerunners of the Palatine Joseph Technical University, which was founded in 1871.¹ According to the foundation statutes, the university consisted of 5 departments: architecture, mechanical engineering, science of engineering, chemical engineering and civil engineering.²

¹ Kornél ZELOVICH. A M. Kir. József Műegyetem és a hazai technikai felsőoktatás története. Budapest, 1922, p. 150–151.

² ZELOVICH, op. cit., p. 150–151.

In 1898 the Hungarian Minister of Trade wanted to extend the profile of the university with departments for commerce and agriculture. He also intended to reduce the proportion of theoretical mathematics.³ The rector of the University refused, pointing to the German and French examples, where teaching was strictly based on theory. Furthermore he mentioned the success of contemporary German industry, and referred to recent English plans, according to which the English were about to reform their technical education by taking over the German model. In conclusion, he stated that the Hungarian education system should also lean on the German one.⁴

At the end of the 19th century, the German model was mentioned again in connection with the new place of the Technical University – but this time in the Lower House of the Parliament. Some representatives referred directly to the results of the German technical higher education, saying for example that “Germany’s outstanding flourishing shown by the industry and trade was prepared by its technical higher education system.”⁵ And arguing that “Nowadays those nations progress and succeed that are in the front line of economic development. It is acknowledged that Germany’s economic boom, which we witness today, was prepared by the intensive and widespread practice of technical education.”⁶

Forms of Communication – the transfer of knowledge

Hungary was interested in taking over innovations from Germany in the field of administration and technology. Such steps were usually preceded by study tours carried out by teachers and students from the Technical University of Budapest, which was rather an indirect approach. In addition, the Technical University established direct contacts with Western-European partners by corresponding with the technical colleges, including German ones. In 1899, information was requested about the number of Hungarian students at German Technical Colleges. However, when the addressed institutions in Berlin, Hannover

³ The Archive of the University of Technology and Economics, Budapest, fol. 18. VKM: 68018/1898.

⁴ The Archive of the University of Technology and Economics, Budapest, fol. 18. 554/1898

⁵ Quotation by Ernő Kammerer. Cited by ZELOVICH, op. cit., p. 221. Source: The Diary of the Lower House 1901–1906. VII. k.

⁶ Quotation by Károly Hieronymi. Cited by ZELOVICH, op. cit., p. 221. Source: The Diary of the Lower House 1901–1906. VII. k.

and Brunswick (Braunschweig) replied, they gave the total number of students from Austria-Hungary.⁷

Another similar case helped in the reconstruction of the university's inner organisation. In 1905 the rector's office requested data from the German technical colleges about the size of their assistant staff. Appropriate replies came from Graz, Vienna, Zurich and Berlin. The same channel worked vice versa, too. For example, in 1906, the rector of the polytechnical school in Cöthen (Germany) requested information about students' associations at the Technical University in Budapest.⁸ The response of the Hungarian institution clarified the point that the organised political and sports-life of the Hungarian students was not as lively as in Germany.

At the beginning of the 1910s, both students and teachers maintained Hungarian-German contacts by means of study-tours. There is information about these tours in the papers of the financial administration.⁹ From 1910 excursions were registered led by Ottó Tandor and Aladár Willinger between 25th June and 11th July, and a later one led by Donát Bánki and Tibor Melczer. A tour in 1913 to Hamburg is also known.¹⁰ As an example of mutual interest, a delegation from Dresden visited Hungary in 1912. The Technical University welcomed them on 28th April 1912 and entertained the guests for 3 days.¹¹

Another form of communication between institutions was the doctor "honoris causa" award. The award was introduced to Hungary relatively late, only in 1909. Until the end of WWI only 8 people had received the title. Unfortunately this list cannot be the object of further examinations, because it contains only the names of Hungarian professors with one exception.¹² However, a question arises whether Hungarian scientists were rewarded abroad. Therefore "honoris causa"-titles, and also memberships in German academies or scientific societies are

⁷ The Archive of the University of Technology and Economics Budapest, 1899, item Nr. 46, 365/1899; 998/1899; 2045/1899; 2046/1899.

⁸ The Archive of the University of Technology and Economics Budapest, 1906, item Nr. 56, 1818/1906.

⁹ The Archive of the University of Technology and Economics Budapest, 1910, item Nr. 40, 1292/1910; 1204/1910.

¹⁰ The Archive of the University of Technology and Economics Budapest, 1913, item Nr. 5, 1850/1913.

¹¹ The Archive of the University of Technology and Economics Budapest, 1912, item Nr. 47.

¹² ZELOVICH, op. cit., p. 175; The Programme of the Hungarian Royal Joseph Technical University from the year 1917/1918. Budapest, 1917, p. 121.

taken into consideration here. It is generally acknowledged that between 1857 and 1919 at least 2 or 3 professors taught simultaneously at the Technical University of Budapest, who were honoured with the above mentioned titles. Their total number covered 12 persons.¹³

The study tours of the students and teachers

Study tours by Hungarian teachers and students played a very important role in establishing and maintaining German connections of the Technical University of Budapest. During the Austro-Hungarian dualism the Hungarian government supported such studies, part-time studies and study-tours. These study-tours and excursions usually involved visits to factories, public institutions and scientific institutes. Students at the Technical University showed active participation in these projects. It is worth examining the period 1899–1914, which was a time of enormous technological development in the world.

The documents in the archives list 17 people who were sent abroad during the above mentioned period; in addition one teacher was sent three times within 15 years. The link between this group of people is that they visited some colleges, conferences but also factories or modern technical achievements. The main destination of these tours was Germany, sometimes as part of a complex Central-European journey. The participants applied for a scholarship usually granted by the ministry for education and religion. The following chart shows a summary of the tours.

¹³ See the Lecture-lists and the Programmes of the Technical University of the Budapest from the period 1857–1919.

STUDY-TOURS OF STUDENTS AND TEACHERS FROM THE TECHNICAL UNIVERSITY OF BUDAPEST 1899–1914¹⁴

YEAR	NAME	DESTINATIONS	AIM
1899	Oszkár Réthy, mechanical engineer	Austria, Germany, Switzerland	visit the main electric transmission centres and technical colleges ¹⁵
1900	Pál Lázár, university professor	North-America	study-tour ¹⁶
1900	Dezső Nagy, univ. professor	Paris	congress on material testing
1900	Sándor Rejtő, univ. professor	Paris	congress on material testing
1900	Gusztáv Rados, univ. professor	Paris	congress on mathematics
1900	Richárd Sebathiel, engineer	Munich, Stuttgart, Karlsruhe, Zurich, Berlin	studies in bridge-construction, visit the most famous buildings ¹⁷
1900	Károly Papp, assistant teacher	Munich, Zurich	studies on geo-palaeontology
1901–1902	Ákos Karkovány, assistant teacher	Vienna, Prague, several German cities and colleges	visits to factories, mechanical departments, technical institutes, experimental stations ¹⁸
1902	István Kendi Finály, engineer	Germany	studies in water conducts, systems of canalization, seaports ¹⁹
1907–1908	Kálmán Róka, chemical engineer, assistant teacher	Technical College of Berlin	study sugar-manufacturing ²⁰

¹⁴ All references refer to the materials of the Archive of the University of Technology and Economics Budapest.

¹⁵ 1899, item 35, 1746/1899.

¹⁶ 1899, item 35, 1009/1899.

¹⁷ 1899. item 35, 57049/1899; 46967/1899; 1900. item 1, 34695/1900, 962/1900, 1901. item 11, 1778/1900; 663/1901; 21511/1901.

¹⁸ 1902. item 2, 906/1901; 934/1902.

¹⁹ 1903. item 24, 31090/1903.

²⁰ 1908. 787/1908. (no item marked)

1908	Sándor Léderer, chemical engineer	Karlsruhe	researches in petrochemical industry
1908–1909	Béla Jánosi, mechanical engineer	Italy, Germany, England	insight of big power plants, industrial establishments, institutions of the workers' welfare, business life, English language ²¹
1909	László Szathmáry	Technical College of Berlin	study the colouring compounds ²²
1910	Dr. Béla Bresztovszky, private-tutor	Berlin, Stockholm, London, Manchester, Zürich, Paris, Freiberg	visit experimental departments (max 45 days) ²³
1911	Ákos Karkovány	Germany, England	visit machine exhibition, wind-engine experimental plant ²⁴
1911	Dr. Ferenc Wittmann, university professor	Germany, Paris, London	view some college laboratories and wireless telegraph stations ²⁵
1912	József Fabinyi, student	Technical University Aachen	work at the electrochemical laboratory of the college ²⁶
1913	Adolf Czakó, university professor	Leipzig	participate in international exhibition on building industry ²⁷
1913	Ákos Karkovány, university teacher	Technical University of Dresden	view wind-engine experimental plant ²⁸
1913	Miksa Hermann, university teacher	Germany, Switzerland, England	study machine factories and machine-workshops ²⁹

²¹ 1910. ítem 20, 528/1910.

²² 1910. ítem 20, 918/1909; 1022/1909.

²³ 1910. ítem 20, 16246/1910.

²⁴ 1911. ítem 3, 72/1911; 738/1911; 44103/1911.

²⁵ 1911. ítem 3, 918/1911.

²⁶ 1912. ítem 9, 67887/1910.

²⁷ 1912. ítem 28, 1299/1912.

²⁸ 1913. ítem 5, 1630/1913.

²⁹ 1913. ítem 5, 163/1913.

With the help of the chart it is clearly visible that one of the main destinations of such study tours was Germany. Numerous people went abroad with several different goals. Among the journeys there are study tours focusing on one special task, but also longer studies involving several semesters. The tours, which were led to one place, usually targeted a German technical college. The other tours, which included visits to more countries, normally involved a quite long German part, with the viewing of several German towns and technical colleges. All the main branches of the technical science can be found among the interest of the participants, such as architecture, chemistry, mechanics, but with greatest emphasis on electrical engineering.

Professors and students of the Technical University had the possibility to apply for several scholarships. In most cases the Ministry of Education and Religion offered a study-tour scholarship, but sometimes the Minister of Trade also issued scholarships.³⁰ Some prominent companies interested in technical research launched scholarship programmes during the first decade of the century, too, such as the Ganz Works,³¹ the Petroleum Refinery,³² the Hungarian Sugar Industry Joint Stock Company,³³ etc.

A carefully elaborated procedure led to the successful application for a scholarship. The applicant asked the senate of the university to present him to the ministry for the scholarship; if not the university senate had the right to decide, regularly in the case of company-sponsored scholarships. The rector then presented someone to the responsible ministry in the name of the senate. To each application he had to attach at least one supporting declaration by a university professor. The ministry decided on the scholarship and the conditions, together with the form of payment on the basis of the presentation, the research plan and the supporting declarations. In case of longer scholarships it was usual to pay the stipend in two instalments; half the amount at first and the other half after the first semester if the beneficiary's report was accepted. Writing a report was required after certain time, and of course at the end of the stay abroad. These reports were handed to a professor of the Technical University of Budapest for assessment. The ministry could form an exact picture about

³⁰ Éva VÁMOS. Deutsch-ungarische Beziehungen auf dem Gebiet der Chemie, der Lebensmittelchemie und der chemischen Industrie. In Holger FISCHER – Ferenc SZABADVÁRY (edd.). *Technologietransfer und Wissenschaftsaustausch zwischen Ungarn und Deutschland*. München, 1995, 223.

³¹ 1907, item Nr. 9. – Béla Jánosi received it.

³² 787/1908 – Sándor Léderer received it.

³³ 787/1908 – Kálmán Róka received it.

the reasonable spending of the sum. If there was no problem either with the content or with the technical circumstances, the ministry accepted the report and sent it back to the university.

There was also an indirect advantage of such international cooperation: foreign studies were supposed to serve the welfare of the nation. In the ordinance of the Minister of Trade in 1910, it can be read that one of the conditions for granting the scholarship was the prospect of making good use of the foreign studies after returning to Hungary. In the cases of Aladár Schuller and Artur Rosinger, the ministry recorded that the above mentioned scholars should return to Hungary after their scholarship, but not later than the end of the next year, and that Hungarian industry should profit from their studies.³⁴

This particular requirement was utilized in further cases, as well. Oszkár Réthy, a mechanical engineer, wrote a report about his study-tour to the Minister of Trade, Dr. Sándor Hegedűs in 1899.³⁵ In his report of 31st October, 1899, he described the details of his visits and summarized his experience. His aims were to visit the main electric transmission centres, power plants and laboratories of electricity in Austria, Germany and Switzerland. His route led through Vienna, Linz, Salzburg, Innsbruck, Munich, Schaffhausen, Winterthur, Zürich, Baden, Rheinfelden, Basel, Mannheim, Darmstadt, Strasbourg, Frankfurt and Berlin. He saw the major electric centres, power plants (“electric factories”), factories run by electricity and some college institutes.³⁶ He had the chance to view the electrotechnical or electromechanical laboratories of the technical colleges in Vienna, Munich, Zurich, Darmstadt and Berlin. In addition, he visited academic institutes, like the Electronic Research Institute (Elektronische Versuchsanstalt) in Vienna and the Imperial Institute for Physics and Technology (Physikalisch-Technische Reichsanstalt) in Berlin. It was a rich programme carried out in a short period of time. Full of experience and new knowledge, he returned. University professor, Ferenc Wittmann gave a positive evaluation about Réthy’s journey to the department of mechanical engineering. As a result, the ministry accepted Réthy’s report.

Two months later Réthy wrote his next paper, which the rector of the university sent to the minister in the early months of 1900. According to the new report, Réthy was permitted entry to the electrotechnical factory of Siemens and

³⁴ 1910, item Nr. 20, 233/1909.

³⁵ Oszkár Réthy received 600 Ft scholarship from the minister for trade in 1899 with the purpose of training abroad.

³⁶ The Archive of the University of Technology and Economics, Budapest; item 1746/1899.

Halske in Charlottenburg, and could work there as an employee. This was a good chance to have a closer look of the latest electrotechnical improvements, but it would be impossible to complete reports frequently. Consequently the rector requested the minister to reduce the number of compulsory reports.³⁷

Two years later, Ákos Karkovány, an assistant teacher of the Technical University was granted a scholarship. In 1902 he wrote a 49-page long full report about the 2nd and 3rd semesters of his journey, in which he recorded, that in the 1st semester he had worked in Rudolf Sack's factory in Leipzig. He left this for an economic exhibition in Halle, where he took part in professional meetings and visited the economic institutes and the research centre of mechanics of the University. He also visited some factories. From there he went to Berlin, where he studied at the Technical College (Charlottenburg) and the College of Agriculture. He also inspected some factories.³⁸ In the second part of his tour he visited several German towns, especially industrial centres like Hannover, Poppelsdorf, Karlsruhe and Stuttgart, because of their technical or agricultural colleges. Karkovány was also in Hohenheim, where he could see the research centre of mechanical engineering. After Germany, he went to Paris, then to England to continue the study tour and to do the same as in Germany.

Summary and Outlook

In Hungary the period between 1867 and 1914 was prosperous. It was obvious at the time that economic prosperity cannot be possible without good education in the field of natural sciences and technology. Both the Hungarian government and leading companies provided help for those who were eager to gather experience and up-to-date knowledge abroad in Western European countries. Several students and teachers of the Technical University in Budapest visited Central-European, mostly German technical colleges, research centres and modern factories with the help of the above mentioned supporters. They were young, ambitious and ready for the new things in order to enable Hungary's progress.

The famous colleges and towns they visited were of touristic interest as well, yet the eyes of the students were focused on new technical innovations. They had a sense for the appropriate places and where to find them; Siemens-Schuckert electric factories, Siemens-Schuckert cable-factory, Bergmann Electric Works,

³⁷ The Archive of the University of Technology and Economics, Budapest, item 696/1900.

³⁸ The Archive of the University of Technology and Economics, Budapest, item 934/1902.

European Weston Electrical Instrument Co., Electric Works of Berlin,³⁹ Telefunken, Vereinigte Windturbinenwerke,⁴⁰ etc. The Hungarian students went there, viewed new technology and returned to implement the innovations on Hungarian soil. Especially would-be doctors left the country for foreign studies, and some private scholarships provided financial help⁴¹. In closing, two figures are presented which also can inspire further thinking on this issue:

- Between 1867 and 1897 35 engineers, 17 architects and 3 mechanical engineers had a German degree accepted at the Technical University of Budapest. The degrees were mostly received in Munich.⁴²
- Between 1890 and 1919 1626 Hungarian students were enrolled at a German technical college.⁴³ The most popular destinations were: Mittweida, Munich, Berlin-Charlottenburg, and Karlsruhe, which all proved to be suitable places to study in the age of the Second Industrial Revolution.

The Technical University of Budapest used to ask the German Technical Colleges and Universities about different matters in letter-form. Another form of this communication was the arranging of excursions to the partner-universities. Next, we can mention the doctor “honoris causa” awards, and furthermore the membership of Hungarian professors in German scientific academies or societies. And lastly are the study tours of students and teachers to mention.

In my presentation I analysed these visits by Hungarian students and professors from the Technical University of Budapest to European destinations, the purpose of which was to gather experience. It was a good period for such visits: the Hungarian government supported the studies, the part-time studies and the study-tours of Hungarian students and professors abroad. These studies usually involved the visit of factories, public institutions and scientific institutes. The students of the Technical University showed active participation in these projects.

³⁹ The list is from Béla Jánosi's report. The Archive of the University of Technology and Economics, Budapest, item Nr. 528/1910. The report was supervised by Károly Zipernowszky, a co-inventor of the transformer.

⁴⁰ These companies are mentioned in the reports of Ferenc Wittmann (item Nr. 918/1911) and Ákos Karkovány (item Nr. 1630/1913).

⁴¹ Endre HÖGYES (ed.). *Emlékkönyv a Budapesti Királyi Magyar Tudomány Egyetem Orvosi Karának Múltjáról és Jelenéről*. Budapest, 1896, 826 pp. (About the foundations for students of the medical faculty.)

⁴² *A Magyar Királyi József-Műegyetem Programja az 1897-1898-ik tanévre*. [The Programme of the Hungarian Royal Joseph Technical University for the year 1897–1898]. Budapest, 1897, p. 91–98.

⁴³ László SZÖGI. *Magyarországi diákok németországi egyetemeken és főiskolákon 1789–1919*. Budapest, 2001, p. 31. In the previous period (1867–1890): 702 – tendency increasing!

The documents of the archives list 17 people who were sent abroad during the above mentioned period, including one teacher, who was sent three times within 15 years. The link between them is that they visited some colleges, conferences then even factories or modern technical achievements. The main destination of these tours was Germany, sometimes as part of a complex Central-European journey. The participants applied for a scholarship, granted usually by the Ministry for Education and Religion.

It is worth seeing the method of applying for scholarships, the rules for the finances and the final reports on record. In my study I show these parts of the procedure and I also highlight the aim of these efforts: to benefit the Hungarian industry and transportation.

Resumé

Technická univerzita v Budapešti se obvykle obracela na německé techniky a univerzity s různými dotazy v dopisech. Další formou komunikace a získávání informací byly exkurze na partnerské vysoké školy. Jako ještě jiné formy lze zmínit udělování titulů „honoris causa“ a dále členství maďarských profesorů v německých vědeckých akademiích a společnostech. Na konec je třeba uvést studijní cesty studentů a učitelů.

Ve článku jsou analyzovány návštěvy maďarských studentů a profesorů z Technické univerzity v Budapešti na různých místech v Evropě s cílem získat zkušenosti. Vybrané období bylo pro takové návštěvy dobré: maďarská vláda jak celá, tak částečná studia i studijní cesty maďarských studentů a vyučujících v zahraničí podporovala. Obvykle zahrnovaly návštěvy továren, veřejných institucí a vědeckých ústavů. Studenti techniky se na projektech aktivně podíleli.

Archivní dokumenty zaznamenávají 17 lidí, kteří byli posláni do zahraničí ve vytyčeném období, včetně jednoho učitele, který byl vyslán během 15 let třikrát. Spojují je návštěvy některých vysokých škol, konferencí a dokonce továren či moderních technických zařízení. Hlavním cílem těchto cest bylo Německo, někdy jako součást celkové cesty po Střední Evropě. Účastníci žádali o stipendium obvykle na ministerstvu vyučování a kultury.

Je cenné vidět metody žádostí o stipendia, pravidla pro financování a závěrečné zprávy v dokumentech. V článku jsou tyto procedury ukázány a podtrženy také cíle těchto snah: přispět maďarskému průmyslu a dopravě.

Author's address:

Krúdy Gyula Academic Grammar School Győr
Örkény I. u. 8-10, H-9024 Győr