

INTERNATIONAL PARTNERSHIP BETWEEN RIGA TECHNICAL UNIVERSITY AND KARLSRUHE ENGINEERS OVER THREE CENTURIES (1862–2024)

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Summary. The oldest technical university in Germany, the Karlsruhe Institute of Technology (KIT), celebrates its 200th anniversary in 2025. The Institute (then known as Karlsruhe Polytechnicum; KP, Polytechnikum Karlsruhe) was one of the models after which the predecessor of Riga Technical University (RTU), Riga Polytechnicum (RP), was founded in 1862. The oldest technical university in Latvia, Riga Technical University, has been closely associated with Karlsruhe engineers and scientists for over 160 years. Scientists, university lecturers, and engineers have collaborated, shared experiences, developed engineering sciences, and sought new opportunities for collaboration in science and university pedagogy. More than 80 former students of Riga Polytechnic Institute (RPI) have continued their studies in Karlsruhe, with some also serving as lecturers at the KP. At the end of the 20th century, RTU also established cooperation with the Karlsruhe University (KU).

Keywords: Riga Technical University, Karlsruhe Institute of Technology, Karlsruhe University, engineering education, inter-university cooperation.

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Introduction

Cooperation between universities in different countries has existed since their founding and is still relevant today. This is also the case with the oldest technical university in Riga – RP. Looking back in history, in the second half of the 19th century and the beginning of the 20th century, Riga engineers and university lecturers had the closest ties with universities in Germany, Austria, and Switzerland, because in them, like at RP (1862–1896), the language of instruction was German and their goals and traditions were similar. The established contacts were maintained even after the reorganization of RP into RPI (1896–1919) with the Russian language of instruction. With the development of rail and sea transport, and later telephone communications, information was obtained more quickly, which facilitated the pace of cooperation. The Baltic Germans, who were the wealthiest and most educated residents of Riga and the Baltic provinces, and who had contacts with fellow students, friends, and relatives in Europe, including Karlsruhe and its Technical University, played a major role. Considering that the language of instruction at RP was German, lecturers from Germany and other countries could communicate freely, and most Riga residents, regardless of nationality, also spoke German. In 1896, when RP was reorganized into RPI, the language of instruction became Russian, which was not mastered by university lecturers who came from Western Europe, including Karlsruhe.

This study began as the authors continued to explore the inter-university cooperation that was initiated several years ago and resulted in a joint report on the partnership between RTU and the Technical University of Dresden (1862–2024) [1]. The materials were identified in archives and libraries, and the collection of the RTU History Museum was used.

Cooperation Between Riga Polytechnicum and Karlsruhe Polytechnicum in the Second Half of the 19th Century

In the mid-19th century, when the Russian Empire was being formed, there were no multidisciplinary technical universities in either the Baltic provinces or the Russian Empire. Polytechnicums in Germany could share their experience, including the KP founded in 1825, also called the Karlsruhe Polytechnic School (Polytechnische Schule zu Karlsruhe), from 1885 – the Karlsruhe Technical University (KTU, Technische Hochschule Karlsruhe), from 1902 – the Karlsruhe Technical University Fridericiana (Technische Hochschule Fridericiana Karlsruhe), which is why in the

autumn of 1861, representatives of the RP Council visited it and 18 other Western European educational institutions [2]. During the visit, the RP Council received advice, recommendations, university curricula, and plans that were used in the creation of RP. One of the models for creating and developing RP was KP [3]. The RP Council was pleased with this, and its minutes record that on 3 November 1861, it sent a letter of gratitude for the advice and support from the KP Director Ferdinand Jacob Redtenbacher (1809–1863) and the Professor of chemistry, Karl Weltzien (1813–1870) [4], whom the Rigans had met during their visit.

For the new university in Riga to begin its work, the RP Council had another task – to find the RP Director (in modern terms, a rector). The Chairman of the RP Council and the Riga Burgomaster, Otto Mueller (1813–1867), invited Franz Reuleaux (1829–1905), a KP graduate, a student of F. J. Redtenbacher, and a Professor at the Federal Higher Technical School in Zurich (Eidgenoessische Technische Hochschule Zuerich), to work in Riga, but he declined the offer [5]. Mechanical engineer F. Reuleaux began working at the Berlin Academy of Crafts (Gewerbeakademie Berlin) in 1864, later a technical university, where he held the position of Rector (1890–1896). Professor F. Reuleaux played a crucial role in establishing the material foundation of mechanical engineering. Under his leadership, mechanisms were manufactured and educational materials were developed [6]. His care for the material base of RP in the first years of the university’s operation should be recognized as a significant support, because in the early days of engineering education, Riga residents lacked both funds and experience.

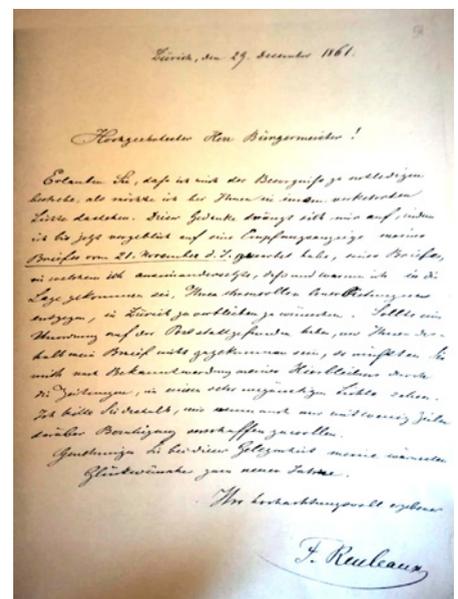


Figure 1. Letter from Franz Reuleaux to Riga Burgomaster Otto Mueller about declining the job offer in Riga. 29.12.1861.

In addition, books compiled by professors of KP ended up in the RP Library. Here must be mentioned: the mechanical engineer Josef Hart (1832–1915); botanist Moritz August Seubert (1818–1878), chemist Karl Seubert (1815–1868), the already mentioned mechanic F. J. Redtenbacher, as well as the physicist, Nobel Prize laureate in physics (1909) Karl Ferdinand Braun (1850–1918); Otto Lehmann (1855–1922), a physicist nominated for the Nobel Prize twice, whose publications were in the collection of RP / RPI Library. The Library also received engineering press, for example, the «Journal für Gasbeleuchtung und Verwandte Beleuchtungsarten, sowie für Wasserversorgung» (Journal for Gas Lighting and Related Types of Lighting, as well as Water Supply) edited by KTU Professor Hans Bunte (1848–1925) [7]. Some of the publications by the aforementioned scientists are currently in the RTU Scientific Library and the University of Latvia Library.

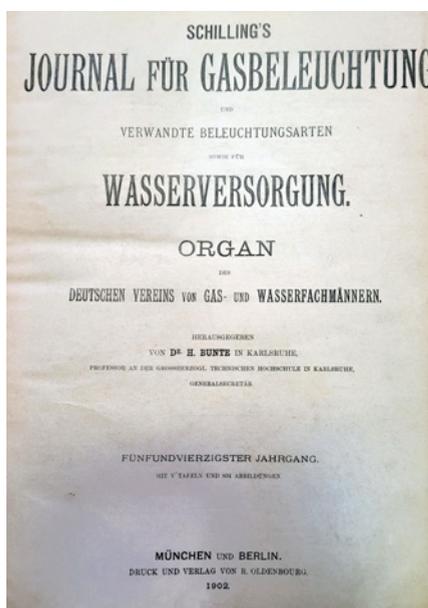


Figure 2. Cover of the «Journal für Gasbeleuchtung und verwandte Beleuchtungsarten, sowie für Wasserversorgung» edited by Professor Hans Bunte. 1902.

The First Lecturers of Riga Polytechnicum – Graduates of Karlsruhe Polytechnicum

When RP started working, it had essentially good, professional lecturers, who mainly came from Western Europe and were graduates of its technical universities. One of the first professors at RP was Gustav

Schmidt (1826–1883), who had studied mechanics at KP. In Riga, he taught courses in mechanical engineering and higher mathematics in the academic year 1862/1863 [8]. However, G. Schmidt had disagreements with the RP administration, and the salaries were not high, so he went to work in Prague.

Among the first lecturers was Karl Joseph Lovis (1839–1911), a KP graduate (1859), who arrived in Riga in 1859 at the age of 20 and worked as an engineer, later as a Technical Manager, at the Haecker Agricultural Machinery factory in Iļģuciems, which at that time was not yet part of the territory of Riga. In 1863, he began teaching at RP [8], was appointed a professor in 1870, and remained at the university until 1901. He taught the following courses: initially, mathematics, general and agricultural machine learning, technology, technical mechanics, and theoretical machine learning; in later years, mechanical heat theory, furnaces, heating and ventilation, water power machines, steam boilers, steamboats, locomotives, and mechanical engineering. The Professor was the first Dean (1870–1901) of the Department of Machine Engineering (Mechanics). In addition to his work at RP / RPI, K. J. Lovis was the Editor (1864–1876) of the Riga Technical Society newspaper, one of the founders (1873) and Directors of the mechanical engineering company «Felser & Co», worked in the technical office «Lovis und Weir», JSC «Sirius» [9; 711], and also compiled a textbook.

The RP Department of Machine Engineering, founded in 1864, was most closely associated with the Riga industry, in which K. J. Lovis and his colleagues were involved, and graduates of the Department had internships and jobs in factories. They participated in the work of the Riga Technical Society by presenting papers, taking part in discussions, and writing about current issues in engineering in the press [10].



Figure 3. Karl Joseph Lovis. 1860s.

Among the most active members of the Riga Technical Society, one should also mention the mechanical engineer Karl Moll (1831-?) – a KP graduate and a former student of Professor «the father of kinematics», F. Reuleaux. They had both compiled the manual «Constructionslehre für den Maschinenbau» (1854; Design for Mechanical Engineering). K. Moll was described very positively to the people of Riga by his teacher, F. Reuleaux, and K. Moll arrived in Riga in 1870 [11] to take up the position of lecturer Leonidas Lewicki (1840–1907). L. Lewicki was also familiar with F. Reuleaux – he was, for a short time, an Assistant Professor in Zurich (1862), but in Riga and elsewhere, steam pile drivers designed by engineer L. Lewicki were popular for many years.



Figure 4. Leonidas Lewicki. 1860s.

Assistant Professor (1870–1871), Professor (1872–1896), K. Moll taught a course in mechanical engineering at the Department of Machine Engineering, and at the Department of Trade – commercial arithmetic (1874–1892), and also served as Dean of the Department of Trade (1876–1877) [11].

His article on steam engines was published in several sequels in the Latvian newspaper «Mājas Viesis» in 1875 [12]. The Professor obtained a patent for the novelty of adding textile to drive belts in addition to leather [13]. However, due to Russification and the change of the language of instruction at the university, he left Riga for Karlsruhe in 1896.

In 1912, the 50th anniversary of the founding of RP / RPI was celebrated, and K. Moll, along with other scientists and university teachers, was nominated for RPI Honorary Membership [14]. Only six of the nine nominated were awarded this Honorary title, and K. Moll's name was not on the list. It should be noted that 11 German technical universities, including Karlsruhe, congratulated RPI on its 50th anniversary.



International Partnership Between Riga Technical University and Karlsruhe Engineers Over Three Centuries (1862–2024)

Figure 5. Karlsruhe Technical University building. 1907.



Figure 6. The Karlsruhe Institute of Technology building today. 2025.

Lecturers of Riga Polytechnicum / Riga Polytechnic Institute in Karlsruhe

RP lecturers moved to Karlsruhe to work for various reasons. Thanks to its many years of successful activity, KP had gained popularity and recognition; however, the RP Director Ernst Nauck (1819–1875) managed to attract some KP graduates to the new technical university (RP) – talented educators and scientists endowed with organizational skills. It must be acknowledged that not all lecturers at RP remained in their positions for many years, as salaries were low and social security benefits were minimal. In 1866, Professor Etienne Laspeyres (1834–1913) from the University of Basel, Switzerland, came to Riga and carried out all the preparatory work for the opening of the RP Department of Trade in 1868. However, the organizer of the Department, one of the most prominent economists and statisticians, moved to the University of Dorpat (Universitaet Dorpat) in 1869 [15]; but in 1873, he went to Germany – he began working at the Karlsruhe Polytechnicum, and later – at the University of Giessen (Universitaet Giessen).

In Dorpat, E. Laspeyres developed the aggregate index theory, which was applied in economic statistics and economic analysis. His formula for calculating inflation is also known worldwide. The RP faculty maintained contacts with E. Laspeyres and other former faculty members who returned to Western Europe.

Also known worldwide is Engelbert Arnold (1856–1911), the Swiss electrical engineer, the «count of electrical engineering», a graduate of the Federal Zurich Polytechnicum (Eidgenössisches Polytechnikum in Zuerich, 1878). In 1880, the engineer became an Assistant to RP Professor K. Moll (later also his father-in-law), and from 1883, he was an RP Assistant Professor. Since the academic year 1885/1886, electrical engineering has been included in the curriculum of the Department of Machine Engineering [16]. It was taught from 15 April 1886 by E. Arnold, who worked as a lecturer at the University in Riga until 1891 [17]. He was also an author of textbooks and an entrepreneur who produced self-designed dynamos. E. Arnold did not speak Russian, and as Russification intensified, he and his family moved to Switzerland, and in 1894, to Karlsruhe. There he worked as a Professor at the KTU until the end of his life in 1911, and was also its Rector (1906–1911). In Karlsruhe, he met again Professor K. Moll, who spent the rest of his life in this city. Thanks to E. Arnold, RP was among the first higher educational institutions in the world and the first in Tsarist Russia to start training high-current electrical engineers.

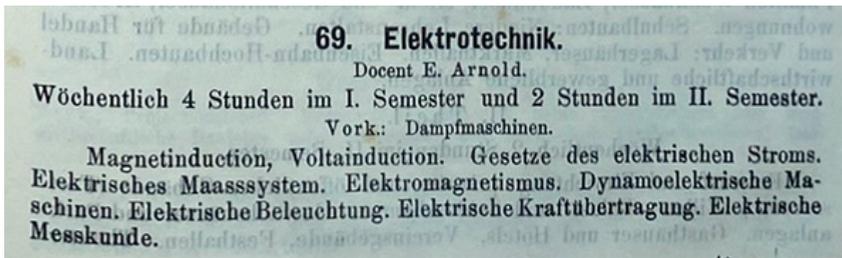


Figure 7. Description of the electrical engineering course taught by Assistant Professor E. Arnold. 1885.

International
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Three Centuries
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Karl von Stilinger (1870–?), a Riga resident, graduated from the RP Department of Machine Engineering (1895) and was an RPI Assistant in Mechanical Engineering (1897–1899), completed a course for gas engineers at KTU (1910), and settled in Western Europe.

Many RP / RPI lecturers were educated at several universities, including KP / KTU. Here should be mentioned: RP Professor of Mechanical Technology (1876–1879) Martin Schoenflies (1841–1879) [18], Lecturer in drawing (1871, 1874) Oskar Poelchau (1835–1882), Assistant in the Laboratory of Chemical Technology (1908–1910) Johann Jacoby (1882–?), and Assistant in Chemical Technology (around 1910) Pawel Grebnew (1878–?).

It must be assumed that the botanist, mathematician, RP / RPI Professor of Geometric Geometry Karl Reinhold Kupffer (1872–1935) visited several technical universities in Europe at the beginning of the 20th century, because in September 1905, he wrote a report on teaching geometric geometry at technical universities in Western Europe, including Karlsruhe [19].

Students and Graduates of Riga Polytechnic Institute – Lecturers at Karlsruhe Technical University

At the beginning of the 20th century, RPI graduates worked not only in the Russian Empire, which included the territory of present-day Latvia, but also abroad, including Karlsruhe. Bronislaw von Michelis (1870–1960), a graduate (1897) of the RPI Department of Mechanics, had some teaching experience, working as an Assistant at his alma mater in Riga (1895–1897). He then went to Karlsruhe to study and was also briefly an Assistant (1898) at KTU [9; 257]. Conrad Friedrich Gruenewaldt (1884–1945), a graduate (1909) of the RPI Department of Engineering, developed

his habilitation thesis in Karlsruhe (1927) [20] and worked as a Professor for longer than B. fon Michelis, two years (1932–1934).

Four former students of the RP / RPI Department of Mechanics have worked as assistants at KTU. Nikolai Adelung (1857–?) graduated from the University of Heidelberg (1888) and was an Assistant (1892–1894) at the KTU Zoological Institute. Ralph von Sengbusch (1885–?) studied at RPI shortly, from 1 September to 16 November 1905 [21], as the university was closed due to the events of the 1905 revolution. He studied electrical engineering at KTU and in 1908, began working as an Assistant to Physics Professor August Schleiermacher (1857–1953). Ernst Seywang (1883–?) studied mechanical engineering at KTU. After graduating from university (1906), he worked in a mechanical engineering factory, and in 1909, as an Assistant in Mechanical Technology to KTU Professor Georg Lindner (1859–1948). The Dane Niels Hviid (1882–1967) graduated from KTU (1907) and was a Private Assistant (1909–1911) to Carl Engler (1842–1925), a KTU Professor and one of the founders and most important promoters of petroleum science and technology [9; 500, 534, 577].

After World War I, chemistry was taught at KTU by physical chemist Andreas von Antropoff (1878–1956), a graduate (1904) of RPI Department of Chemistry and RPI lecturer.

Students and Graduates of Riga Polytechnicum / Riga Polytechnic Institute – Students of Karlsruhe Technical University in the Second Half of the 19th Century and the Beginning of the 20th Century

KTU was a popular university not only among local but also foreign students. From 1900 to 1905, 25 % of students were foreigners, mainly from the part of the Russian Empire that is today the territory of Poland, and RPI students who were born in both the Kingdom of Poland and various provinces of the Russian Empire, as well as a few from other countries. The number of students at KTU and RPI at the beginning of the 20th century was approximately similar – in the academic year 1902/1903, almost 1900 students studied in Karlsruhe [22], and 1527 at RPI. By 1915, the number of students at RPI had reached 2000, while in Karlsruhe, it was in decline. The RPI students who studied in Karlsruhe were of different nationalities, including Latvians, Russians, Germans, Jews, Armenians, Danish people, Poles, and others, making the national composition of the RPI students remarkably diverse.

From 1868 to 1912, more than 80 RP / RPI students studied in Karlsruhe, some of whom continued their education there after graduation.

Before studying at the RP KP, three young people studied in the 1870s, two of whom received an RP diploma. By 1900, 12 RP / RPI students had studied at the KP / KTU, of whom four graduated from the University in Karlsruhe, three of whom obtained a diploma in electrical engineering in the late 1890s. Three more RP / RPI graduates from the Department of Mechanics went to Karlsruhe for their studies.

At the beginning of the 20th century, two graduates and five students of the Department of Mechanics went to Karlsruhe, one of whom – Konstantin Sarkissow (1876–?) – continued his studies and graduated from RPI (1911). Nikolai Petrov (1875–1940), a graduate (1900) of the RPI Department of Agriculture, after his studies in Riga, spent three years in private studies in Karlsruhe, where he studied chemistry with Professor C. Engler, and photography with Professor Fritz Schmidt (1861–1937). N. Petrow was a corresponding member of the Karlsruhe Photography Society since 1904.

The events of the 1905 revolution also reverberated at RPI – students participated in demonstrations, RPI buildings were shelled, and the university was closed in the academic year 1905/1906. It was unknown when studies could resume, and many young people went to study at foreign universities, including 55 to Karlsruhe. Their fates were different: 20 graduated from KTU, 20 from RPI, but 15 did not complete their studies. The majority completed their studies in the following years (1906–1911). Only Latvian chemist Pauls Kalniņš (1886–1955) graduated from KTU in 1923, finishing his studies in Karlsruhe (1907–1912) that he had begun after the 1905 revolution. P. Kalniņš was an Assistant to Friedrich Bergius (1884–1949), a Private Docent, Professor at the Hanover Technical University, and Nobel Prize Laureate in Chemistry (1931), who worked at the KTU during P. Kalniņš' studies, in 1909. P. Kalniņš worked at the University of Latvia during the interwar period and was elected Professor in 1940 [23].

More than one young person went to KTU to study electrical engineering because the aforementioned former RP lecturer, KTA professor E. Arnold, was known to the «polytechnicians»; and this branch of science, compared to others, was new and interesting. One of them was Kārlis Tormanis (1882–1950), a graduate (1911) of the KTU Department of Electrical Engineering, whose thesis supervisor was Professor E. Arnold. K. Tormanis and another KTU graduate (1911) – civil engineer Fritz Efferts (1880–1959) – had already known each other during their studies at RPI. In 1921, both developed a technical solution for the Amata Power Plant project in Kārļi, which was not implemented [24]. Another graduate (1913) of the KTA Department of Electrical Engineering – Kārlis Vējiņš (1885–?) – worked for many years at the Riga City Craftsman School and Technical School (1926–1941) [25], and was also a Member of the Latvian Chamber of Professions (1939–1940).



Figure 8. Karlsruhe Technical University Diploma issued to Tormanis. 1911.

It is interesting to note that out of the 11 graduates of the Department of Architecture in 1907 [26], four studied at KTU – two (Artūrs Krūmiņš (1879–1969), Herbert Tiemer (1879–1938)) studied in Karlsruhe when RPI was closed, and two (Heinrich Blumenthal (1880–?), Marjan Behr (1879–?)) supplemented their knowledge after their studies. H. Tiemer was one of the Art Nouveau architects of Riga, while A. Krūmiņš is known not only as an architect and architectural historian but also as the author of the libretto for the first Latvian opera, opera «Baņuta» (1903) by Alfrēdis Kalniņš' (1879–1951). During his studies in Karlsruhe (1906–1907), A. Krūmiņš was influenced by the prominent German researcher of architectural history, Professor Josef Durm (1837–1919), the author of fundamental handbooks on Etruscan, Italian Renaissance, Ancient Roman, and Ancient Greek architecture [27]. These are still in the collections of RTU and the University of Latvia Libraries.

Of the 12 graduates of the RPI Department of Architecture in 1911, two studied at KTU – Edgar von Irmer (1885–1967) and Alfon Fischer (1885–?).

Cousins Karl Agthe (1886–1974) and Johann Agthe (1882–?) also studied at KTU, having started their studies at the RPI Department of Chemistry. Both cousins' fathers were graduates of RP. Karl's father, Adolf Agthe (1850–1906), graduated from the RP Department of Engineering (1873) and is known as the Chief Engineer of Riga (1887–1899) and the founder of the Mežaparks development, while Johann's father, Edmund

Agthe (1852–1904), was a graduate of the RP Department of Technical Chemistry (1879). In 2015, descendants of the Agthe family donated six volumes of Karl Agthe's memoirs to the Museum of the History of Riga and Navigation. In them, he mainly wrote about Riga and his father, Adolf Agthe.

The courses taken at RP / RPI were considered equivalent to those at KTU, so students requested RPI certificates of passed exams. Ruwin Hotz (1884–?) also requested one [28]. After RPI was re-established, he returned to RPI and graduated from the Department of Mechanics (1910).

When the 1905 revolution was over, and RPI had successfully resumed its activities, seven students went to Karlsruhe, among them Heinrich Blumenthal (1880–?) and Marjan Behr (1879–?), graduates of the RPI Department of Architecture (1907). So, out of the 11 graduates of 1907, six, or more than half, of the architects acquired their knowledge at KTU. Of the seven post-revolutionary students mentioned in Karlsruhe, five received diplomas from RPI.

Two RP / RPI graduates obtained a doctorate in engineering at KTU: in 1910, Harald Vallem (1869–1953?), a graduate (1893) of the RP Department of Machine Engineering; and in 1927, the already mentioned KTU lecturer C. F. Gruenewald.

Most of RP / RPI students had obtained the necessary education to study at educational institutions of the Russian Empire, including Riga real schools, gymnasiums, the RP Preparatory School, etc., while the graduate (1883) of the RP Department of Technical Chemistry, Jozef Orłowski (1859–?), born in Warsaw, Poland, had graduated from the real gymnasium in Karlsruhe, and somebody else had attended a mathematics class in Karlsruhe.

RP / RPI students came to Karlsruhe not only to study engineering. After three years of study at the Department of Agriculture (1876–1879), Woldemar von Sternberg (1854–1925) decided to turn to singing and even made his debut in an opera at the Riga City Theatre (1885). He studied music in Karlsruhe [29]. Meanwhile, Oskar Lieth (1885–?), a graduate (1912) of the RPI Department of Engineering, won a silver cup in a running competition in Karlsruhe in 1906 [30].

Relations with Karlsruhe University of Technology in the Interwar Period

After the proclamation of the Republic of Latvia, the need for a national higher education institution arose. Therefore, in 1919, the University of Latvia (UL, until 1923 – Latvian Higher School) was founded, in which, in

addition to the humanities, engineering sciences were also represented; the RPI was actually incorporated into the UL, and only in 1958, it was restored as an independent higher education institution. The language of instruction at the University of Latvia was Latvian, and many RPI graduates and former teaching staff worked there. Most of the old RP / RPI lecturers had either left Latvia or passed away, and some had taken a well-deserved retirement. Contacts with universities in Germany and other countries did not cease; they developed in directions appropriate to the era, but there were few close contacts with scientists from Karlsruhe. Among the Honorary Members and Honorary Doctors of the University of Latvia during the interwar period, there is no one from KTU.

The political situation and the establishment of the Republic of Latvia also introduced adjustments to the lives of local Baltic Germans and the population of German origin living in the Baltics. During World War I, Germanophobia spread in Russia, and as a result, German lecturers at RPI who were not Russian citizens were dismissed from their jobs at the university, deported to Siberia and the Volga region. Some went to Western Europe or returned to their ethnic homeland. RPI operated in evacuation in Moscow during World War I, and after the end of World War I, the university's material base was destroyed; most of the inventory, equipment, teaching aids, as well as lecturers and students, remained in Russia. The buildings of RPI stood in the centre of Riga, but in October 1918, the Baltic Technical University began operating in the institute's premises with the German language of instruction [31] – this was ensured by the military occupation administration established within the German army, which existed from August 1915 to November 1918. In the German-occupied Baltic provinces, self-defence units of the population were established – the Baltic Landwehr, the organization of which began in the autumn of 1918. The KTU became a gathering place for Baltic German students, where they could gain knowledge in their chosen profession. Almost all of them had fought in the Baltic Landwehr and defended the newly formed state against the Red Army, fighting against the Bolsheviks. The German Empire, where many of the «polytechnicians» had relatives, also collapsed. Problems also arose because the new generation did not speak the local languages and could no longer study at universities in Riga and Tartu (Dorpat) [32].

The physical chemist Andreas von Antropoff, a Tallinn-born RPI graduate and lecturer who was arrested during World War I on suspicion of spying for Germany, played a major role in attracting students to KTU. The physical chemist was active in the oldest German student corporation, «Fraternitas Baltica», founded in Riga (1865).

A. von Antropoff habilitated at KTU (1918) and taught courses in physical chemistry and inorganic chemistry until 1925, when he moved

to the University of Bonn. Six corporals were A. von Antropoff's students in Karlsruhe, but in total, 19 representatives of the aforementioned corporation from the former Baltic provinces studied between 1918 and 1929 [32]. There were also those who had begun their studies in Riga.

Among the lecturers of engineering sciences at the University of Latvia (1919–1944) were mechanical engineer and heat engineering specialist Aleksandrs Bankins (1882–1965), architect Artūrs Krūmiņš, KTU graduates – electrical engineer Kārlis Tormanis and chemist Pauls Kalniņš, the only one who had closer contacts with his alma mater in Germany, as he graduated from KTU only in 1923. After World War II, when the University of Latvia was renamed the State University of Latvia, the list of its lecturers included P. Kalniņš, A. Krūmiņš, and K. Tormanis, while A. Bankins emigrated at the end of World War II. A new collaboration was formed only at the Faculty of Mechanics – in the academic year 1938/1939, lecturer and UL graduate (1933) Jānis Hugo Inveiss (1896–1981) was granted scientific leave and was seconded to KTU. J. H. Inveiss received an A. Humboldt scholarship for this, and from 1 November 1938 to 31 July 1939, he studied mechanical engineering, specializing in the arrangement of machine laboratories, piston engines, machine testing, and issues of experimental education of students [33]. J. H. Inveiss used the knowledge and skills acquired at KTU in establishing machine laboratories at the Faculty of Mechanics of the University of Latvia and organizing practical work for students.

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spēks mašīnu laboratorijām.
12. 11. 38 J. Inveiss

Figure 9. J. H. Inveiss' application to the Rector of the university with a request to grant a business trip to Germany, France, Switzerland, Italy, Czechoslovakia, Belgium, and Poland during his scientific leave. 1938.

In 1927, Magda Voit (1902–1997), a graduate (1927) of the University of Latvia, married German chemist and later Nobel Prize laureate (1953), Hermann Staudinger (1881–1965), becoming Magda Staudinger. Her

husband, H. Staudinger, was a Professor of Organic Chemistry at KTU for a few years (1907–1912). At that time, RP / RPI students also studied with him. In the 1930s, the Professor spent several summers in Latvia with his wife and would have also lectured to UL students, if only the officials of Hitler's Germany had allowed him to do so [34].

After World War II, engineer and cultural worker Kārlis Ieleja (1909–1970), who completed his engineering studies at the University of Latvia in Munich, was a doctoral student at KTU, and lived and worked in the Federal Republic of Germany (FRG) and the USA [35]. In the 1st semester of the academic year 1945/1946, 10 Latvians were admitted to KTU. In the 2nd semester, there were 15 Latvian students [36]. In the academic year 1946/1947, KTU invited foreigners to study, including those Latvian residents who had become refugees at the end of World War II and ended up in Germany [37].

However, times had changed, and the benefits of studying at KTU and the university's offers applied to those residents living abroad who had emigrated from Latvia. Engineering and higher education institutions in Latvia operated in accordance with the orders of the Soviet regime, and cooperation with Western universities was not permitted. New contacts were established and maintained, and cooperation and friendship agreements were concluded with universities in socialist countries. Karlsruhe was located in the FRG, but cooperation was only possible with universities in the German Democratic Republic, which was also implemented. Student and lecturer exchanges took place with universities in Dresden, Ilmenau, Rostock, and others. Only after the reunification of Germany (1990) and the restoration of the Republic of Latvia (1991) did cooperation begin with other universities around the world.

Cooperation Between Riga Technical University and Karlsruhe University

Although there was an intention to create a joint study program with the Karlsruhe Institute of Technology, which is the successor to KP, founded in 1825 and acquiring its current name in 2009, this was not realized. Since 1996, cooperation has been established with another higher education institution – Karlsruhe University (KU, Hochschule Karlsruhe), founded in 1878. In 1998–1999, KU professors Heinz Saler, Hans-Otto Peter, and Reiner Jaeger participated in the joint RTU and KU project «GEMLA or Geomatics Education in Latvia». The international coordinator of the project was Jānis Bikše (1939–2010), Assistant Professor of the

Geodesy and Cartography professorial group of the RTU Faculty of Civil Engineering [38].

The collaboration continued after more than 10 years in the joint project «Theory and Practice in the Cross-Section of Current Geomatics». In connection with the project, lecturers of the RTU Department of Geomatics, Mārtiņš Reiniks and Jānis Kaminskis, gave lectures to students and lecturers of bachelor's and master's study programs at KU on 26 and 27 November 2012. M. Reiniks and J. Kaminskis, one of the authors of this article, introduced the audience to the following topics:

- cadastral surveying in Latvia, legislation, practical examples, and analysis of problem situations;
- topographic surveys in the territory of Riga Municipality;
- inter-university cooperation of RTU Department of Geomatics in education, research, and current events in Latvia;
- development of geomatics topics at RTU in cooperation with regional scientific institutes, including topics in the field of space geodesy, and the possibilities of using various innovative solutions.

The cooperation was supported by the Baltic-German Higher Education Office, attracting funds from the German Academic Exchange Service (Deutscher Akademischer Austauschdienst (DAAD)) [39]. The cooperation was also implemented in organizing international conferences – one of the members of the scientific commission of the subsection «Geomātika» (Geomatics) of section «Būvzinātne» (Civil Science) of the 56th RTU International Scientific Conference in 2015 was the long-time cooperation partner – KU Professor Reiner Jaeger [40].

In 2025, the RTU postdoctoral project «Hibrīda gravitācijas lauka modeļa, kas balstīts vertikālajās novirzēs un gravimetrijā, projektēšanas optimizācijā: mašīnmācīšanās kā alternatīvas pieejas novērtēšana» (Design Optimization of a Hybrid Gravity Field Model Based on Vertical Deflections and Gravimetry: Evaluating Machine Learning as an Alternative Approach) is being implemented by RTU graduate Katerina Runde, who is a visiting student at KU [41].

Conclusions

One of the oldest international partnerships between Riga Polytechnicum and Karlsruhe Polytechnicum began in 1861 and continued until World War II, when cooperation was not possible for political reasons. The language of instruction facilitated cooperation and students' desire to study in Karlsruhe, as well as attracting lecturers to work in Riga – it was not only Germans who knew German. Until the end of the 19th century, it was not only the language of instruction but also

the language of communication between RP students and lecturers, and the language in which cooperation with German universities was carried out. World-renowned scientists (E. Arnold, F. Reuleaux, E. Laspeyres, et al.) participated in the international partnership. As RP began its work and developed, it needed university lecturers, and several professors, KP graduates, moved to Riga to help ensure high-quality studies. At critical moments – during the RPI's interrupted work due to the 1905 revolution and after World War II – the Karlsruhe KTU provided an opportunity for several dozen former students of RP / RPI and the UL, as well as those who chose to study in Karlsruhe, to continue their education. Electrical engineering was a popular speciality, but architecture, chemistry, mechanical engineering, and mechanics were also of interest to young people.

After a half-century break, the partnership with Karlsruhe was renewed, collaborating with another higher education institution, KU. It has resulted in joint projects and guest lectures. The international partnership has enriched not only the history of RP / RPI (since 1990 – RTU), as well as the history of the University of Latvia, but also made a significant contribution to the pedagogy and science of the university.

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SOURCES OF ILLUSTRATIONS

Figure 1. LNA LVVA 3143. f., 1. apr., 1860. l., 54. lp.

Figure 2. A. Zigmundes privātarhīvs.

Figure 3. RTU IVPC.

Figure 4. RTU IVPC.

Figure 5. A. Zigmundes privātarhīvs.

Figure 6. Photographer Katerina Runde.

Figure 7. Programm der polytechnischen Schule zu Riga für das Studienjahr 1885/1886. Müllerschen Buchdruckerei, Riga, 1885, S. 51.

Figure 8. LNA LVVA 1632. f., 1. apr., 21917. l.

Figure 9. LNA LVVA 7427.f., 13. apr., 649. l., 68. lp.



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International
Partnership
Between Riga
Technical
University
and Karlsruhe
Engineers Over
Three Centuries
(1862–2024)



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Rīgas Tehniskās universitātes un Karlsrūes inženieru starptautiskā partnerība trijos gadsimtos (1862–2024)

Vecākā tehniskā universitāte Vācijā – Karlsrūes Tehnoloģiju institūts (KTI) – 2025. gadā atzīmē 200 gadu jubileju. Institūts (tolaik – Karlsrūes Politehnikums; KP; *Polytechnikum Karlsruhe*) bija viens no paraugiem, pēc kura 1862. gadā tika dibināts Rīgas Tehniskās universitātes (RTU) priekštecis – Rīgas Politehnikums (RP). Ar Karlsrūes inženieriem un zinātniekiem vecākā tehniskā universitāte Latvijā – Rīgas Tehniskā universitāte – ir cieši saistīti vairāk nekā 160 gadu. Zinātnieki, augstskolu docētāji, inženieri sadarbojušies, dalījušies pieredzē, attīstot inženierzinātnes un meklējot jaunas sadarbības iespējas zinātnē, augstskolu pedagogijā. Karlsrūē studijas turpinājuši vairāk nekā 80 bijušie RP / Rīgas Politehniskā institūta (RPI) studenti, daži arī strādājuši par KP docētājiem. RTU 20. gadsimta beigās izveidojās sadarbība arī ar Karlsrūes Augstskolu (KA).

Atslēgvārdi: Rīgas Tehniskā universitāte, Karlsrūes Tehnoloģiju institūts, Karlsrūes Augstskola, inženieru izglītība, starpaugstskolu sadarbība.