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Scientists and mathematicians in Czernowitz University

(1) Introduction

Czernowitz University, the youngest university in Franz Joseph's empire was in many respects different from the other universities because of the brevity of its existence, because of its position in the Far East of the Empire in one of its poorest regions and because of the composition of its students.

A call to Czernowitz University was for many scientists the first step in their academic career. The study of the careers of academics, which began at the university in Czernowitz gives an excellent insight in the mobility of scientists in the last decades of the Habsburg Empire. In this paper I am only going to discuss the careers of mathematicians, physicists, chemists and other natural scientists.

Five of the young scientists, who started in Czernowitz, were later elected to become members of the Austrian Academy of Sciences, one became a member of the Bohemian Academy of Sciences, two received the Lieben Prize, the most prestigious Austrian science prize before WW I and one of them finished his scientific career at Harvard University after he had become famous world wide in his field.

(2) The political background for the foundation of the university

Czernowitz University could not look back to an old tradition, like other universities in the Empire. It was only founded in 1875 by a decision of the Reichsrat of "Cisleithanien" and existed within the empire only for 44 years. Cisleithanien was the expression commonly used for all provinces and counties of the Empire — outside Hungary — which came under the jurisdiction of the Reichsrat (the Austrian parliament). It included not only the German-speaking provinces of Austria in the Alpine region but also Bohemia, Moravia, Galicia and the Bucovina.

Czernowitz University was founded at the zenith of the liberal era in Austria, in the same year, when for the first time a Jew, Adolf Lieben, received a call to Vienna University as department head. At that time several new institutes were built, such as the chemical Institutes in Prague and Graz and others were enlarged despite of the serious economic crisis, which began in Austria in 1873.

In the multi-lingual Empire the language question in education became an issue of growing importance in the second half of the 19th century. In Lemberg (Lviv) University in Galicia, which had been founded in 1784, the language of teaching had been German since the beginning of the 19th century, just as in all other universities in the empire outside Hungary, although the languages mainly spoken in Galicia were Polish and Ukrainian. Under the pressure of the Polish national movement the university started in the sixties to hold some classes also in Polish language. Finally, in 1872 the university was turned into a Polish university, where all classes were held in Polish language.

After the change of the Lemberg University into a Polish university, there remained only four German universities in the Empire: the universities in Vienna, Prague, Graz and Innsbruck, all of them in the Western part of the country. The powerful Liberal Party, which wanted to keep up the German supremacy in Cisleithanien supported the foundation of a fifth university in which classes were to be held only in German language. Two cities were in discussion regarding the establishment of the new university. Brünn (Brno) in Moravia and Czernowitz in Bucovina. But it seemed rather doubtful whether a university in Brno, so close to Vienna would find enough students. Therefore the Liberals supported the wish of the Diet of the Bucovina County, to establish a university in the capital of this province, in Czernowitz. The supporters expected that the university would start with 300–400 students.¹

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¹ Prokopowitsch E., *Gründung, Entwicklung und Ende der Franz Josephs Universität*, Clausthal Zellerfeld 1955, p.13.

In the parliamentary debate, two prominent Liberal deputies, who were university professors, Eduard Suess and Max Menger, were rather critical regarding the plan to establish a university in the Far East of the Empire, although the majority of the Liberals supported this plan. These two professors feared that the university would only attract young scientists at the beginning of their career, who would leave the university after one or two semesters or insignificant persons, who could not do any work of importance. They thought that it would be better for the development of science in Austria to use the money for the improvement of the existing universities and colleges. But finally the parliament decided to allow 76.000 Florin for the foundation of Czernowitz University.² It can be seen that this was a very small sum by comparing it with the sums used for building chemical institutes in Vienna and Graz. 500.000 Florin was required to build the institute in Vienna a few years earlier and 300.000 were assigned for the institute in Graz.

(3) The social and national situation in Bucovina

Czernowitz was the capital of the Bucovina County, an area which had come under Austrian rule in 1775 under Maria Theresia and Joseph II. Before that, it belonged to the Romanian Duchy Moldavia, which was part of the Ottoman Empire. The inhabitants were mainly Romanians and Ukrainians, when it came under Austrian rule. Most of the landed property was owned by Romanians and the Orthodox Church. The Ukrainians were peasants, usually dependent on the landowners.



Cisleithania

1. Bohemia
2. Bukovina
3. Carinthia
4. Carniola
5. Dalmatia
6. Galicia and Lodomeria
7. Litorale
8. Austria above the river Enns
9. Moravia
10. Salzburg
11. Upper and Lower Silesia
12. Styria
13. Tyrol
14. Austria below the river Enns
15. Vorarlberg

Transleithania

16. Hungary
17. Bosnia and Herzegovina
18. Croatia and Slovenia

The foundation of Czernowitz University took place in connection with the centenary celebration of the annexation of the Bucovina by Austria. After 100 years under Austrian rule the Bucovina still remained one of the poorest parts of the Empire. Agriculture was not very productive, particularly in the southern region and forestry was long hindered by a poor infrastructure. Only in the last decades of the Habsburg Empire the railway net was enlarged to such an extent that it was better than in Styria,

² Prokopowitsch E., p.14; Rosner R., *Chemie in Österreich 1740–1914 Lehre, Forschung, Industrie*, p. 225 and p. 244.

right in the centre of Austria. In this period also the number of elementary schools was adjusted to the general Austrian standard.

Under the Austrian rule great efforts were made to settle Germans in the Bucovina, mainly for the administration but also as miners. Although some German settlers were peasants, the majority of them were part of the urban middle class.

Another group that developed rapidly were the Jews. As living conditions for Jews were better in Bucovina than in Galicia and even much more so than in Russia, all attempts to stop the immigration of Jews to Bucovina, which were made in the first decades of Austrian rule, failed. The Jews were forced at that time to send their children into German schools. As many Jews spoke both German and the various local languages it was for them much easier to obtain a job in the administration, than in other parts of the Empire.

Bucovina had at the end of the 19th century a population of about 700.000 persons, of which 42 % were Ukrainians, 33 % Romanians, 21 % Germans, 3 % Poles and other national groups (Lipowenes, Huzuls etc). About 70% of the persons, listed in the census as Germans, were Jews. In Czernowitz the proportion of people, speaking German, was 50%.

(4) The structure of the new university and its staff

Three faculties were planned, when Czernowitz University was founded. These were a Greek-Orthodox faculty of theology, a faculty of law and a faculty of philosophy. The language of teaching was German and there were no classes in other languages, although only a minority of the population was German-speaking. Only in the faculty of theology some classes were held in Romanian or Ukrainian. No medical faculty was planned because of the high costs of such a faculty, but within the faculty of philosophy a study of pharmacy was possible.

The targeted number of 300–400 students was achieved only in the nineties of the 19th century, that is 15 years after the foundation of the university, but in the following two decades the number of students increased rapidly because 15 grammar schools and high schools with 7000 to 8000 students had been established. At that time also some women began to study. The number of women students grew from 4 in 1899 to 49 in 1907 and to 75 two years later. Particularly the study of pharmacy attracted many women.

In the year 1907/1908 55% of the students declared German as their mother tongue, 21 % Romanian and 14 % Ukrainian. In other years the percentage was similar. Although the Ukrainians were the largest nationality in Bucovina it had the smallest number of students. Statistics on the religion of the students in that year showed that 39 % were Jews, 33 % Greek Orthodox and 24 % Catholics. In the law school 46 % of the students were Jewish, in the faculty of philosophy 37 % and among the pharmacy students 80%.³

In the beginning of the 20th century there were a much larger proportion of illiterates in Bucovina, than in the Western parts of the Empire, because the school system had developed very slowly. The census in 1900 listed 60 % illiterates in Bucovina and only 30 % in the whole Empire. However the percentage of high-school students was much higher than in other parts of the country.

The faculties of Law and Theology were established right after the foundation of the university in 1875, but there seem to have been some difficulties to find qualified teachers for natural sciences. Classes in physics and chemistry started only in 1876. The persons, who received a call to Czernowitz were usually young lecturers (Dozenten) and sometimes teachers from technical schools. In Czernowitz they got the position of an associate professor.

In most cases the call to Czernowitz was the first step in the career of scientists. Some of them became later the most prominent professors in their particular field. Just as it had been predicted .by Suess and Menger in the parliamentary debate, the persons, who accepted a call to Czernowitz, were usually young scientists at the beginning of their career. However, contrary to their expectations and fears, a position in Czernowitz was so attractive or the possibility to obtain a suitable position in another university so small that most of the young professors — with a few exceptions — remained many years in Czernowitz, some among them with a high reputation in the Austrian scientific community. Out of the 8 professorial chairs for mathematics and sciences there were only two, mathematics and mineralogy, where the professors left for another university after a few years. The other professors remained for many years, often up to their retirement. As it will be expounded later

³ Slawinsky I. (ed.), *120 Jahre Universität Czernowitz*, p. 159.

on, most of the calls which professors from Czernowitz received, came from the universities of Innsbruck, Graz or Prague. There was never a direct call from Czernowitz straight to Vienna.

The professors remained there despite the fact that life was for a long time much more difficult in Czernowitz than in the Western university towns and the working conditions even more so. Thus, gas works in Czernowitz, which produced gas for the laboratories, were only installed in 1890, whereas most towns in the Western part of the country already had gas works since the fifties or the sixties of the 19th century. It took a long time until a water supply and sewer system for the whole town was introduced. The building for the science institutes was only finished in 1883. Science was taught in the palace of the archbishop before that.

The following professorial chairs for science were installed as part of the faculty of philosophy in 1876: Theoretical physics, experimental physics, mineralogy, chemistry, botany, and zoology. There was very close cooperation between the chair of theoretical physics and the chair of mathematics, which had already been installed in 1875. More science chairs were installed after the turn of the century. They were chairs for geology, cosmic physics, pharmacognosy and a second chair of mathematics.

(5) The mathematics and science professors

The only chair, where a frequent change took place was the chair for mathematics. The first professor who started the department of mathematics was Leopold Gegenbauer (1849–1903), at the time 26 years old, who had studied mathematics and physics at Vienna University under Petzval, Stefan, Lang and Boltzmann and had then gone to Berlin for a postgraduate education. Gegenbauer remained only four years in Czernowitz. He received a call to Innsbruck in 1879 and then to Vienna in 1893. Already in 1883 he had been elected as corresponding member of the Academy of Sciences.

His successor, Gustav Escherich (1849–1935) was 30 years old and already an assistant professor at Graz University when he received a call to Czernowitz University. His papers dealing with problems concerning analytical geometry had found great attention. In 1882 that was already after three years, he received a call to the College of Technology in Graz. He remained there only for two years before he got a position at Vienna University. In 1885 he was elected as member of the Academy

Also the next professor for mathematics, Adolf Migotti was there only for four years. He came from the Vienna College of Technology and was 33 years, when he started in Czernowitz. He died as a result of a mountaineering accident in Tyrol.

His successor, Anton Puchta (1851–1903), was the first one who could teach mathematics at the university for a longer period. He had studied in Prague and Munich and soon after he received his degree as lecturer (Habilitation) in Prague he got the position of an associate professor. The call of Puchta to Czernowitz in 1887 was one of the few cases in which an associate professor from another university received a call. His main subject of research was the development of methods for the calculation of curved planes. He remained in charge of the mathematics department until his death in 1903.

Puchta's successor, Robert Sterneck (1871–1928) was 33 years old when he came to Czernowitz in 1904. Although he had a lectureship at Vienna University, he actually only worked on the staff of the university library until he received the call. His publications on the theory of numbers found much interest and he became a member of the Moscow Mathematical Society. Later he became interested in hydrodynamics and he published several papers on hydrographical problems, in which he studied the tides of the Mediterranean Sea. He also left Czernowitz already after 3 years, when he received a call to become full professor of mathematics at Prague University.

Sterneck's successor was Josip Plemelj (1873–1967), a Slovene, who had studied in Vienna under Boltzmann, Gegenbauer and Escherich and continued his studies in Berlin and Göttingen. At the age of 29 years he had received his degree of lectureship (Habilitation) at Vienna University. Before he went to Czernowitz he taught as associate professor at the Vienna College of Technology. Plemelj was considered to be one of the great experts on differential equations. His special lectures in Czernowitz dealt with the theory of functions. In 1912 he received the prestigious Richard Lieben Prize. After the war he became professor at the newly founded Ljubljana University.

A second chair for mathematics was established in 1909 and Hans Hahn (1879–1934) was appointed as head. Hahn, who had studied in Vienna and had received his lectureship degree (Habilitation) in 1905, chose determinants as the theme for his special lectures in Czernowitz. Hahn was badly injured during the war in 1915 and in 1917 he received a call to Bonn. Later he returned to Vienna and he became a member for the famous Vienna Circle. In 1921 he also received the Richard Lieben Prize

In Czernowitz there were two chairs for physics from the beginning, the chair for Theoretical Physics and the chair for Experimental Physics. In 1910 one more chair, a chair for Cosmic Physics was established. Anton Waßmuth (1844–1927) was appointed as first professor for theoretical physics. Waßmuth, who had studied in Prague under Mach had received his lectureship degree (Habilitation) in Vienna for his publications on electricity and magnetism. He was 32 when he received the call to Czernowitz. Before he came to Czernowitz, where he remained for 14 years, he had worked as a teacher in a high school. In Czernowitz he continued his studies on electromagnetism and on the interchange of heat and magnetism effects. Another field of interest was thermoelasticity. In 1890 he received a call to Innsbruck and three years later to Graz, where he remained up to his retirement. In 1903 Waßmuth was elected as a member of the Academy of Sciences.

Ottokar Tumlriz, (1856–1927), Waßmuth's successor, who was called to Czernowitz in 1891, was also a student of Ernst Mach. He had been lecturer at Prague University for 10 years and one year in Vienna before he received an appointment in Czernowitz. Tumlriz's fields of investigation were also electromagnetism and heat radiation. He remained at Czernowitz University for 15 years, just like his predecessor. In 1906 he accepted a call to Innsbruck. Tumlriz was elected to become a member of the Academy in 1904.

The Czernowitz – Innsbruck road was not a one-way street. In 1906, after Tumlriz moved to Innsbruck, Czernowitz University appointed Michael Radakovic (1866–1934) to take over the chair of Theoretical Physics. Radakovic had studied in Graz. After two years in Berlin, where he worked with Helmholtz and Kirchhoff, he made his Habilitation in Innsbruck. His field of specialisation was mechanics and he made ballistic studies. He became well known for his paper on the muzzle velocity of a projectile. Radakovic remained in Czernowitz until he received a call from Graz in 1915.

The chair for Experimental Physics was established by Alois Handl (1837–1915) Handl was 39 years of age when he came to Czernowitz in 1876. He was much older than most of the other professors who started there. He had already been a full professor at Lemberg University. After this university was turned into a Polish university he taught at the Military Academy in Wiener Neustadt until he received the call to Czernowitz. In Czernowitz he collaborated closely with Richard Přibram, the professor for chemistry. They investigated the viscosity of numerous organic compounds and they published their results not only in the *Sitzungsberichte* of the Austrian Academy of Sciences but also in Ostwald's *Zeitschrift für Physikalische Chemie*. Handl remained in charge of this chair up to his retirement in 1906

He was succeeded by Joseph Geitler (1870–1923). Geitler, a cousin of Heinrich Hertz, had studied in Prague and Bonn and obtained Habilitation in Prague. His research activities focussed mainly on various phenomena of different electromagnetic waves such as X-rays. Geitler remained in Czernowitz until the university was turned into a Romanian university

In 1910 a chair for Cosmic Physics was established under the direction of Victor Conrad (1876–1962). Conrad had studied in Vienna under Julius Hass and he worked in the Vienna Central Meteorological Institute before he received his call to Czernowitz. One of his first investigations in Czernowitz was a study of the climatology of Bucovina. Conrad became world wide one of the best known experts on climate- and earthquake -research. After the university became Romanian in 1919, Conrad returned to Vienna and worked at first again at the Central Meteorological Institute and later as full professor at Vienna University. Conrad retired in 1936. In 1939 he emigrated to the United States where he worked at Harvard University until his final retirement in 1951.

Richard Přibram (1847–1928) was 29 years, when he was appointed to install in 1876 the chair of chemistry as part of the faculty of philosophy. Although he was still rather young he had already had much experience at several universities. Přibram had graduated 1870 in Prague, after having studied with Liebig in Munich and then in Leipzig and Berlin. Before he graduated, he had already worked as assistant at the zoochemical institute of Prague University, and after graduation for one year at the institute for organic chemistry in Leipzig and one year at the physiological institute of Prague University.

He had come to Czernowitz already in 1874 to organize the chemistry instruction at a newly founded technical school. In this technical school he taught analytical chemistry and chemical technology. Thus, he was familiar with the local situation, when he started at the university in contrast to the other professors, who came there.

As consequence of his own educational background he first engaged himself in dealing with local medico-chemical problems. Thus, he analysed several mineral springs in Bucovina and he published a compendium for testing drugs for physicians, pharmacists and other people, working in the field of

medicine. His research activities focussed more and more on physical-chemical problems. As already mentioned, he worked together with the physicist Handl on a study of the viscosities of several organic compounds, trying to find out in which way substituents, such as methyl groups, halogens etc., influence the viscosity. He was also interested in polarometric investigations and in spectroscopic analysis. At that time many chemists started to investigate several minerals with spectroscopic analysis after Auer had discovered two elements — neodym and praseodym — with this method. Přibram thought in 1900 that he had found in the mineral Orthit in addition to the spectra of gallium spectra of a different element. He named this element patriotically “Austrium” In the same way the Japanese chemist Ogawa thought in 1908 to have discovered an element “Nipponium”. Both “discoveries” were mistakes. In 1906 Přibram retired and moved to Vienna where he continued to teach as lecturer.

His successor was Caesar Pomeranz (1860–1926), who was already associate professor in Vienna before he came to Czernowitz. Pomeranz had studied pharmacy in Vienna and concluded his studies in Czernowitz. Then he returned to Vienna, where he worked with Lieben. Like most students of Lieben he focussed for a long time on questions of the organic chemistry. He started with phytochemical studies and developed an important method for the synthesis of isoquinoline. He also began to investigate physical-chemical problems in later years. After Czernowitz became a Romanian university he returned to Vienna and worked at the agricultural college.

The professors of mineralogy who started in Czernowitz could also continue their career in other parts of the Empire. Carl Vrba (1845–1922), who was in Czernowitz from 1876 until 1881 was called to the Czech University in Prague and became a member of the Bohemian Society of Science. His successor Friedrich Becke (1855–1931) was called to the German Prague University in 1890 and to Vienna University in 1898. He was member of the Austrian Academy of Sciences and was many years secretary of this institution. He was succeeded by Rudolf Scharitzer, (1859–1935) who remained in Czernowitz until he received a call to Graz University in 1909.

In conclusion it can be said, that although there were mainly political motivations for the foundation of a university in Czernowitz, the scientists, working at this university could make a valuable contribution to the development of science in the last decades of the monarchy.

Table 1

MATHEMATICS

Name	University of Education	University of Habilitation	Call to Czernowitz	Time in Czernowitz	University after Czernowitz
L.Gegenbauer	Univ.Vienna	Univ. Vienna	1875	4 years	Innsbruck
G.v.Escherisch	Univ. Graz	Univ. Graz	1879	3 years	T.H.Graz
Adolf Migotti	T.H.Vienna Heidelberg	T.H.Vienna	1883	4 years	died
Anton Puchta	Univ.Prague, Munich	Univ.Prague	1887	16 years	died
R.Sterneck	Univ.Vienna	Univ Vienna	1904	3 years	Univ.Prague
J. Plemelj	Univ.Vienna	Vienna, Berlin, Göttingen	1907	10 years	(Ljubljana)
E. Kruppa	T.H.Graz	Czernowitz	1911	7 years	(TH. Graz)
Hans Hahn	Univ.Vienna	Univ. Vienna	1909	6 years	Univ.Bonn

PHYSICS

Name	University of Education	University of Habilitation	Call to Czernowitz	Time in Czernowitz	University after Czernowitz
A. Waßmuth	Prague	Univ.Vienna	1876	15 years	Innsbruck
O. Tumlirz	Prague	Prague,Wien	1891	15. years	Innsbruck
Radakovič	Graz, Berlin	Innsbruck	1906	9 years	Univ. Graz
Alois Handl	Vienna	Lemberg	1876	30 years	Retired
Josef Geitler	Prague,Bonn	Prague	1906	12 years	(Graz)
V. Conrad	Univ.Vienna	Univ.Vienna	1910	8 years	(Vienna)

CHEMISTRY

R. Příbram	Prague,Munich Berlin,Leipzig	Prague	1876	30 years	Pension
C.Pomeranz	Vienna,Prague, Czernowitz	Univ.Vienna	1906	12 years	(Agr.College Vienna)
J. Lindner	Vienna Czern.	Czernowitz	1912	6 years	(Univ. Graz)

MINERALOGY

Carl Vrba	Univ.Prague	Univ Prague	1876	5 years	Czech Univ. Prague
Friedrich Becke	Univ.Vienna	Univ.Vienna	1882	8 years	Prague
Rudolf Scharitzer	Univ.Vienna	Univ.Vienna	1891	18 years	Graz
Michael Stark	Univ Vienna	Univ.Vienna	1911	4 years	Prague

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