

Emil Weyr a jeho pobyt v Itálii v roce 1870/71

English summary

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Emil Weyr and his stay in Italy

Emil Weyr (1848–1894) was an important Czech geometer. His scientific career was decisively influenced by the study stay in Italy in the years 1870–1871, above all by the meeting with Luigi Cremona (1830–1903).

Youth of Emil Weyr

Emil Weyr was born on September 1, 1848 in Prague as the second of ten children of Marie Rumplová (1825–1889) and František Weyr (1820–1889), secondary school professor of mathematics and physics.

From 1859 to 1865 he attended the German realschule in Mikulandská street in Prague. Already at that time he was engaged in higher mathematics, lead by his father. In the years 1865–1868 he studied at the Prague Polytechnic, where he started to concern himself with new geometry lectured by the German mathematician Wilhelm Fiedler (1832–1912). Emil was an excellent student. Already during studies he started to publish his works and attracted an attention to his talent.

In September 1868 Emil Weyr became an assistant of the higher mathematics chair of the German professor H. Durège (1821–1893). From March 1869 to January 1870 he was doing his one-year volunteer military service. On May 5, 1869 he gained a doctorate in philosophy at the Leipzig University. Encouraged by the physicist and philosopher Ernst Mach (1838–1916), Emil made a request for habilitation at the Prague University; on May 3, 1870 he was appointed private docent of new geometry. In the years 1869–1870 he published two treatises by Teubner in Leipzig: *Theorie der mehrdeutigen geometrischen Elementargebilde und der algebraischen Curven und Flächen als deren Erzeugnisse* (156 pages) and *Geometrie der räumlichen Erzeugnisse ein-zwei-deutiger Gebilde, insbesondere der Regelflächen dritter Ordnung* (175 pages). Till 1870 (inclusive) he had published another 29 works.

Study Stay in Italy

In autumn 1870 Emil Weyr started to prepare himself for the study stay in Paris (he gained the state scholarship of 1000 golden), where Ch. Hermite (1822–1901), J.A. Serret (1819–1885), M. Chasles (1793–1880) and other important mathematicians of that time held lectures. Nevertheless, the German-French war changed his plan. On November 7, 1870 he departed for the study in Milano. First he travelled by train to Terst, then he continued to Venezia where he spent several days with sightseeing. He arrived in Milano only on November 17. Since the end of November till mid-January he was again at home

in Bohemia. Therefore he began to attend the lectures of Luigi Cremona and Felice Casorati (1835–1890) at the polytechnic only in early February. In April 1871 he interrupted the studies, travelled about Italy, visited several Italian universities (Padova, Bologna, Pisa, Florence, Roma, Neapol, also climbed Vesuv) and made contacts with other prominent Italian scientists. Emil Weyr stayed in touch with the following mathematicians: Angelo Armenante (1844–1878), Eugenio Bertini (1846–1933), Guiseppe Battaglini (1826–1898), Francesco Brioschi (1824–1897), Guilio Ascoli (1843–1896), Ulisse Dini (1845–1918), Ernesto Padova (1845–1896), Giusto Bellavitis (1803–1880), Enrico D’Ovidio (1842–1933), Eugenio Beltrami (1835–1900), and with astronomers Giovanni Virginio Schiaparelli (1835–1910) and Angelo Secchi (1818–1878). Also the poet Domenico Carbone (1823–1883) and engineer Quintino Sella (1827–1884) were his friends. Towards the end of May 1871 he had to return to Prague, where the occupation of the chair of an adjunct professor at the Czech Polytechnic was being decided.

Weyr’s Diary

In the Archive of the Academy of Sciences of the Czech Republic a diary is deposited, written by Emil Weyr during his stay in Italy, with several later notes. It is a small notepad (11,8 x 18,4 cm) inside a damaged thin blue cover with a blue-white label. The first record was made on November 7, 1870; the diary had been written in German till March 2, 1871, since then it was written in Czech. The last entry was dated on April 23, 1871. The records were written by pencil or black ink. Some parts are hard legible, Czech notes are full of grammatical and syntactic mistakes. The diary is interesting not only for a description of contacts of Emil Weyr with Italian mathematicians and an atmosphere in the Italian scientific community. It also notices cultural and political events in Italy; above all, it provides an information on collecting first experiences of a young mathematician in his 23 years, his perspective on the world, as well as his struggle with the Czech language, his youthful enthusiasm and his eagerness for all new and free.

Significance of Italian Stay

During his stay in Italy Emil Weyr established a lifelong friendship with Luigi Cremona, as it is supported by his 27 letters from the years 1870–1891 preserved in Cremona’s inheritance deposited in Istituto Guido Castelnuovo, Universita La Sapienza, Roma. At the beginning, Emil wrote his letters as Cremona’s student; they were formal, very polite and impersonal. Later he wrote as Cremona’s friend, colleague and admirer. The letters contain information on Weyr’s mathematical explorations and papers, activities in the Union of Czech Mathematicians and Physicists and at the Czech Polytechnic, on Weyr’s family and his Italian friends. They give an evidence of the lifelong friendship between both mathematicians and show that Emil Weyr established a friendship with many other Italian scientists and artists. In the letters we can also find mathematical problems with which Weyr turned to Cremona, words of thanks for

advice, suggestions, help with grammatical corrections of papers, etc. Let us remark that Weyr's stay in Italy was immensely important and inspirational for his further scientific work. He acquainted himself with the latest achievements in projective and synthetic geometry and wrote several treatises that helped him to gain an attention of European geometers.

In a reaction to his stay in Italy, Emil Weyr wrote 22 works in 1871 (13 German, 8 Italian, 1 Czech), 11 works in 1872 (6 German, 3 Czech, 2 Italian) and 11 works in 1873 (5 German, 4 Czech, 2 Italian). Italian papers were published in journals *Rendiconti di Real Istituto Lombardo* and *Anali di matematica pura ed applicata* (thanks to the cooperation with L. Cremona) and in *Giornali di Matematiche* (thanks to the cooperation with G. Battaglini).

Subsequent Life Story of Emil Weyr

On October 15, 1871 Emil Weyr was entrusted with a deputization of an adjunct professorship at the Prague Polytechnic. On December 1871 his appointment as an adjunct professor of mathematics was confirmed. Together with the lectures at polytechnic he started to lecture as a private docent at the university, too.

From February 6, 1870 Emil Weyr was a member of the Union of Czech Mathematicians, which arose in 1869 from a students' Association for Free Lectures in Mathematics and Physics established in 1862. At a plenary session on July 7, 1872 he was elected a chairman of the Union. In the first half of the seventies he significantly participated in the development of the associational life, in publishing activities, creating a scientific library, he initiated an exchange of publications with foreign societies, etc. Together with his brother Eduard he published two volumes textbook *Foundations of Higher Geometry* (1871, 114 pages; 1874, 186 pages). He also translated two Cremona's books (*Cremona's Geometric Transformations of Plain Figures*, 1872, 47 pages; *Introduction to Geometric Theory of Curves in Plain*, 1873, 176 pages). He was also involved in the work on Rieger's educational dictionary.

In April 1873 Emil Weyr was again in Italy (accompanied by August Seydler, later his brother-in-law). The travel was mainly motivated by consultations with Cremona and official dealings concerning translation of Cremona's second book. Emil Weyr spent holidays 1874 in Paris, where he contacted M. Chasles. He also visited Bordeaux, where G.J. Hoüel (1823–1886) was working, having close relations to the Union from earlier time (honorary member since 1873). After a reorganization of the Union in 1874, Emil Weyr became its permanent secretary. In July 1874 the Union founded an international journal *Archive of mathematics and physics*. Emil Weyr became its editor, published three papers there (in German, French and Italian) and attracted various collaborators (e.g. G.J. Hoüel).

Already in 1873 the board of professors of the polytechnic tried to reach Weyr's appointment full professor. Nevertheless, it was not accomplished. On September 26, 1875 Emil Weyr was appointed full professor at the Vienna University. By that time he had published more than 80 papers in journals.

On November 7, at the general meeting of the Union, he was elected its honorary member and *Weyr's award* was founded, suggested by F.J. Studnička and intended being awarded every five years for the best achievements in new geometry. Weyr's transfer to Vienna was understood as an honour for a Czech mathematician, but also as a significant loss for the Czech mathematical life. Termination of the *Archive of Mathematics and Physics* was most likely connected with Emil's departure for Vienna.

When Emil Weyr left Prague, he stopped playing an important role in the Czech mathematical community and published nearly no more in Czech. We have no detailed information on his further years. In 1877 he married Marie Waniek (1860–1934) in Vienna; they had three children: František (1879–1951), who became an important lawyer (professor of Masaryk University in Brno, president of the State Statistical Office, co-author of the Czechoslovak constitution from the year 1920; we cite many times from his extended memoir here), Jindřich (1880–1957) and Marie (1883– ?).

In 1878 the third volume of the textbook *Foundations of Higher Geometry* of brothers Weyr (167 pages) was published. In eighties Emil Weyr published in Vienna *Beiträge zur Curvenlehre* (1880, 64 pages), two volumes book *Die Elemente der projectivischen Geometrie* (1883, 1887, 231 + 228 pages) and a small treatise *Über die Geometrie der alten Aegypter* (1884, 35 pages).

At the International bibliographic congress of mathematical sciences that took place in Paris in July 1889, Emil Weyr was elected a vice chairman and deputed to conduct the bibliographical work in Austria. As a result of these international efforts, a referative journal *Revue semestrielle des publications mathématiques* published by *Société mathématique d'Amsterdam* started to be printed in 1893. Earlier Emil Weyr wrote reviews of the treatises of Czech mathematicians for *Bulletin des sciences mathématiques et astronomiques* (Weyr was quoted at the title page among the collaborators of this journal) and for *Jahrbuch über die Fortschritte der Mathematik und Physik*. In 1890, together with von Gustav Escherich (1849–1935), he founded a journal *Monatshefte für Mathematik und Physik*, which has been publishing till today (since 1952 *Monatshefte für Mathematik*).

In the last three years of his life Emil Weyr was ill ("general tuberculosis"). He spent his holidays in spas; in spring of the year 1892 he was in the spa Helouan in Egypt (nearby Cairo), during the holidays in 1893 he was in a sanatorium Purkersdorf near Vienna. His illness led up to the loss of his hearing. On January 25, 1894 Emil Weyr died in less than 46 years; he was buried in a family grave in Olšany in Prague on January 30.

The list of journal papers of Emil Weyr contains 137 items; these works were written in German (100), Czech (16), Italian (14) and French (7). Separate publications were mentioned in the text above; they were written in German (6) and Czech (5). The majority of the works was devoted to projective geometry. Emil Weyr published his important results in foreign languages. In the last decade of his life he was therefore considered the most important Austrian geometer and an important European mathematician, his achievements in pro-

jective geometry were highly appreciated. Czech mathematical community received his international activities and successes with enthusiasm. Nevertheless, at the turn of 19th and 20th centuries geometry was substantially transformed; works of Emil Weyr belonged to the topics that subsided gradually and remained without a continuation in modern geometry.

Emil Weyr was awarded various honours. He was an extraordinary member of the Royal Bohemian Society of Sciences (1870), Czech Academy of Sciences and Arts (1890), academies in Milano (1872), Vienna (1875 corresponding, 1882 full member), Zagreb, scientific societies in Bordeaux and Lutych and mathematical societies in Paris (1874), Moscow and Charkov. In 1893 he was appointed court councillor.

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The first part of this monograph contains an in-depth description of the life of Emil Weyr, followed by the list of works devoted to him or providing a detailed information of his life and work, further information on archival materials and the memoirs of Emil's son František. The section is concluded by the list of publications of Emil Weyr, supplemented with references to reference journals.

In the second part a diary is printed, written by Emil Weyr during his Italian stay and later supplemented with several more records; some places are commented in notes. This part also contains four letters written by Emil Weyr to his mother, itinerary of his travel and a register of personalities mentioned in the diary. Weyr's notes, as well as other preserved evidences, present Emil Weyr as an honest and cultivated personality, for whom mathematics is an important but not the only or main component of his life. They represent a precious testimony on the life at the turn of the second and third thirds of the nineteenth century; since we do not have many simialr documents from that time, they even more valuable. They will be interesting not only for mathematicians, but also for historians, linguists and for everyone who wants to learn something about 19th century.

Third part of this publication is formed by a pictorial appendix containing reproductions of photographs, engravings, archival materials, various documents and manuscripts.