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Gerhard Hermann Waldemar Kowalewski and his two Prague periods¹

Abstract. Based on a deep and extensive study of various “funds” of the Archive of Charles University, the Archive of the Czech Technical University in Prague, the National Archive of the Czech Republic, the Archive of the Academy of Sciences of the Czech Republic, the Prague City Archives and the State Archive of the German Republic, we are going to evaluate professional activities and personal life of Gerhard Hermann Waldemar Kowalewski (1876–1950), a famous German mathematician. We will mainly concentrate on his two Prague periods, 1909–1920 and 1939–1945, which has not been sufficiently covered and discussed in the literature.

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1. Kowalewski’s education and his first teaching activities.

G.H.W. Kowalewski was born on March 27, 1876 in Alt Järshagen (Pomerania).^{A.1} He came from a poor German-Polish noble family. His father Leonard Julius (or Leonhardt, † 1929) was a teacher and school councillor, his mother Maria née Pommerening († 1926) was a daughter of Christian Pommerening and Regine Meidow; she was a housewife. Gerhard’s older brother Arnold Christian Felix (1873–1945) became a professor of philosophy and experimental psychology at the University in Königsberg. He was also interested in mathematics and was recognised as a specialist in Bolzano’s philosophical work.²

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²For the basic information see https://de.wikipedia/wiki/Arnold_Kowalewski [30.1.2018], for deeper studies see [24].

Gerhard Kowalewski studied at the primary school in Loebau (West Prussia) and at the Humanist Gymnasium in Graudenz (West Prussia).^{A.2} From 1893 until 1898, he studied classical philology, philosophy, mathematics and astronomy at the universities in Königsberg (now Kalininograd),^{A.3} Greifswald and Leipzig. Among his teachers, we can find several distinguished mathematicians and astronomers, for instance, David Hilbert (1862–1943), Hermann Minkowski (1864–1909), Paul Gustav Samuel Stäckel (1862–1919), Carl Friedrich Wilhelm Peters (1844–1894) and Karl Hermann von Struve (1854–1920). In 1898, he defended his doctoral thesis *Über eine Kategorie von Transformationsgruppen einer vierdimensionalen Mannigfaltigkeit* [10], which he wrote under the supervision of mathematicians Marius Sophus Lie (1842–1899) and Friedrich Engel (1861–1941), professors in Leipzig. He was considered one of Lie's most prominent and gifted students (see [4], [16] and [22]).

Starting in 1898, Kowalewski taught for three years mathematics as an assistant at the University in Leipzig. Then, in 1901, he applied for an appointment at the University in Leipzig as *Privatdozent*. His habilitation procedure was successfully completed in the same year. Starting in 1902, he spent two academic years as an extraordinary professor of mathematics at the University in Greifswald. After that, from 1904 until 1909, he taught mathematics as an extraordinary professor at the University in Bonn (see also [4], [16], [21] and [22]). During this time, he translated Cesàro's Italian books *Lezioni di geometria intrinseca* (1901) and *Corso di analisi algebrica con introduzione al calcolo infinitesimale* (1904) and started to write his textbook on calculus *Grundzüge der Differential- und Integralrechnung* (v. [12]) and on the theory of determinants *Einführung in die Determinantentheorie, einschließlich der unendlichen und Fredholmschen Determinanten* (v. [13]).

2. Kowalewski's first period in Prague (1909–1920). In 1909, Kowalewski arrived in Prague to spend there his first extended, professionally successful period. He achieved the full professor status as a winner of a demanding competition (among his competitors there were Heinrich Liebmann (1874–1939), an extraordinary professor of mathematics at the University in Leipzig, Samuel Oppenheim (1857–1928), a docent of astronomy at the German University in Prague, and Heinrich Tietze (1880–1964), a docent of mathematics at the University in Vienna). The professors' meetings discussed the candidates from the March 1909 until the August 1909, the Ministry of Education in Vienna studied the materials of the competitors from the August 1909 until the October 1909. On November 1, 1909, Emperor Franz Joseph I. ap-

pointed Kowalewski to be the post of the second professor of mathematics at the German Technical University in Prague. Kowalewski started his teaching activities from December 1, 1909. From 1909 until 1912, he was the so-called second ordinary professor of mathematics at the German Technical University in Prague, where he took charge of the education of prospective engineers.^{A.4}

On July 10, 1912, Kowalewski was appointed a regular professor of mathematics (*ad personam*) at the German University in Prague by Emperor Franz Joseph I. as the winner of the competition (his most important competitor was Hans Hahn (1878–1934), a mathematician from Vienna; the competition was opened in the December 1911). Kowalewski started to teach at the German University in Prague from October 1, 1912. From 1912 until 1920, he held a post of the regular ordinary professor of mathematics at the German University in Prague.^{A.5}

Kowalewski described the reasons for his coming, his beginnings in Prague, his first contacts with his colleagues at the German Technical University (especially with Anton Karl Grünwald (1838–1920), Kowalewski's predecessor, and Emil Stransky (1882–?), Kowalewski's assistant), his professor's office and certain interesting specifics of the Austrian education system as follows:

Es war ein Ordinariat an der Deutschen Technischen Hochschule, auf das ich berufen wurde, und zwar das Ordinariat für Mathematik II. Kurs. Ich wurde der Nachfolger des in den Ruhestand tretenden Hofrats Anton Grünwald. Er war noch sehr rüstig, hatte aber die Altersgrenze erreicht und bereits das sogenannte Ehrenjahr absolviert, ja sogar noch ein weiteres Jahr, weil die Besetzung der Professur sich verzögerte, da ich nicht Hals über Kopf von Bonn fortgehen wollte. Grünwald hatte, als ich nach Prag kam, alles für die Übergabe vorbereitet. Ich mußte aber z. B. auf seinen besonderen Wunsch die Handbibliothek des Lehrstuhls, die ziemlich umfangreich war, mit ihm zusammen Buch für Buch durchgehen und mich überzeugen, daß nichts fehlte. Der alte Herr nahm es sehr genau.

Den bisherigen Assistenten Emil Stransky übernahm ich auf Grünwalds Empfehlung und habe an ihm eine große Stütze gehabt, da er gut eingearbeitet war. Der Lehrstuhl, bestehend aus einem Professoren- und einem Assistentenzimmer, war einfach, aber sehr nett eingerichtet. Ich hatte gleich angrenzend ein großes Auditorium mit vielen Fenstern und da-

her schön hell. Ein Diener war dem Lehrstuhl zugewiesen, der für die Reinhaltung aufkam und allerhand Besorgungen machte. Es gab an der Hochschule eine ganze Menge solcher Diener. Sie erhielten ihre Uniform vom Staat und hatten auch sonst allerlei Vergünstigungen. An machen Lehrstühlen oder, wie man in Österreich sagt, Lehrkanzeln hatten sie auch Einnahmen aus Trinkgeldern, die ihnen Studenten zahlten, wenn sie ihnen ein verspätetes Testat beschafften oder ihnen die Examensnote aus der Liste verrieten u. dgl. ([16, pp. 215–216]).



Photo 1: Kowalewski's passport (Prague, 1917)
(National Archive of the Czech Republic, Prague)^{A.6}

Kowalewski succeeded in bringing to Prague many topics of modern mathematics (for example, set theory, modern algebra (matrices, determinants, groups), differential, difference and integral equations, function theory and potential theory, properties of special functions, geometric function theory, special geometric transformations, geometric extremal problems, mathematical theory of games and their applications etc.). He usually presented his courses in every three to four year periods meeting his students for 3 to 5 hours a week and supplementing his courses by elective lectures and seminars of 2 to 4 hours per week.^{A.7}

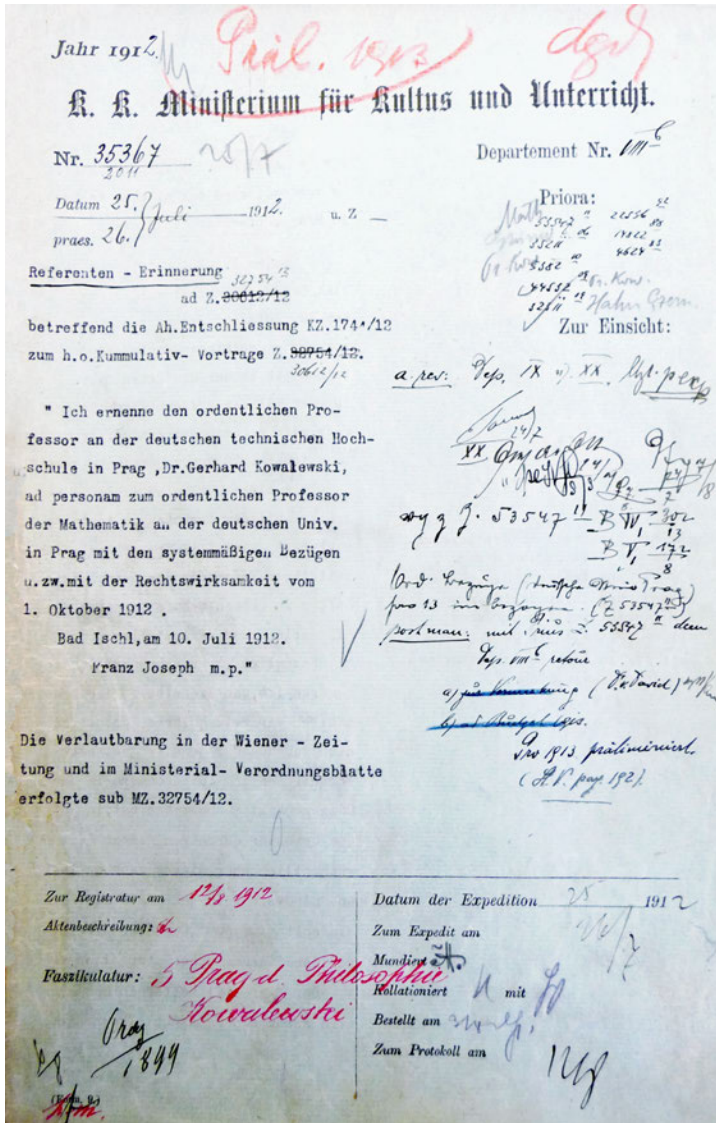


Photo 2: Kowalewski's appointment an ordinary professor at the German University in Prague (National Archive of the Czech Republic, Prague)^{A.8}

Kowalewski also served as external examiner of doctoral theses in mathematics that took place at the German University in Prague from 1912 until 1920. He was a referee of the thesis of Emil Nohel (defended in 1914), Karl Löwner (defended in 1917), Arthur Winternitz (defended in 1917) and Saly Ramler (defended in 1919). He was not

a real “Doktorvater” (supervisor) and he just took part in committees as an examiner of each first (main) oral examination in mathematics and physics.^{A.9} He promoted the study of women; he was a second examiner of the thesis of Marie Vaerting (1880–1964), who later married and used the name Pfeiffer and became a writer. Her thesis entitled *Zur Transformation der vielfachen Integrale* was written under the supervision of Moritz Pasch (1843–1930). She successfully finished her doctoral procedure in 1910 at the University in Gießen.^{A.10} He also wrote his own lecture notes (for example *Einführung in die analytische Geometrie* (1910), *Das Integral und seine geometrische Anwendungen* (1910), *Die klassischen Probleme der Analysis des Unendlichen* (1910), *Die komplexen Veränderlichen und ihre Funktionen. Fortsetzung der Grundzüge der Differential- und Integralrechnung. Zugleich eine Einführung in die Funktionentheorie* (1911), *Mathematica delectans. Ausgewählte Kapitel aus der Mathematik der Spiele in gemeinverständlicher Darstellung* (1921)).

Kowalewski influenced the very first activities of the *Mathematische Kränzchen in Prag* [the Mathematical Circle in Prague], which operated between spring 1913 and spring 1934 and arranged frequent meetings of German, young, energetic, talented professors, docents, assistants and students educated at foreign universities who spent their young years in Prague and excelled in the world. Kowalewski delivered at the meetings of the *Mathematische Kränzchen in Prag* 11 lectures from 1913 until 1919. They included a wide spectrum from analysis (for instance, Du Bois Reymond criterion of the convergence of Fourier series (1913), properties of special functions (1918/1919)) and algebra (for instance, Cartan’s theory of finite groups (1914), symmetric kernels (1914), classification of linear substitutions (1919)), fundamentals of “natural geometry” (1914), geometric extremal problems (1918/1919), geometric levelling (1918/1919) as well as elementary geometry (for instance, Euler’s formula (1918/1919)). He paid attention to interesting problems in the “mathematical circles”. For example the lecture *Das Boss Puzzle* (1918) was inspired by mathematical puzzles, punning, games and their applications. See G. Kowalewski: *Mathematica delectans. Ausgewählte Kapitel aus der Mathematik der Spiele in gemeinverständlicher Darstellung. Heft 1, Boss-Puzzle und verwandte Spiele* (W. Engelmann, Leipzig, 1921, 72 pages). It can be noted that Kowalewski delivered at the German University in Prague a special lecture *Über einige Spiele und ihre mathematische Theorie* (one hour weekly) in the summer semester 1916/1917 and a lecture *Mathematik der Spiele* (one hour weekly) in

the winter semester 1919/1920.^{A.11}

In [16], Kowalewski recollected his reminiscences of his first lecture in Prague (Mathematics II) and special courses, his style of teaching (using illustrative examples suitable for engineers, including vector and tensor calculation into the course, collaboration with his assistant), his friends and colleagues from the German Technical University in Prague and the German University in Prague (for example mathematicians Georg Alexandr Pick (1859–1942), Josef Grünwald (1876–1911), Karl Carda (1870–1943) and Anton Grünwald (1873–1932), engineer Kamil Körner (1868–1943)). He mentioned their hobbies and personal qualities, he gave his opinion of their professional activities and he evaluated their works in the following way:

Nach Erledigung aller dieser Formalitäten konnte ich mich in die Lehrtätigkeit stürzen. Außer dem großen Kurs Mathematik II, der durch zwei Semester ging, hatte ich noch in jedem Semester ein zweistündiges “Spezialkolleg” zu halten, dessen Gegenstand ich frei wählen konnte. Für dieses Spezialkolleg gab es eine besondere Gehaltszulage. Die Übungen lagen in der Hand des Assistenten, mit dem ich aber die zu behandelnden Aufgaben immer eingehend besprach. Mein Vorgänger hatte die Graßmannsche Ausdehnungslehre in den Kurs eingebaut. Ich ersetzte sie durch Vektor- und Tensorrechnung. In der Vortragsweise paßte ich mich ganz den Bedürfnissen der Ingenieure an und brachte in der Vorlesung viele Beispiele. Meine Spezialkollegs wurden auch von Studenten der Deutschen Universität besucht. Mathematik I vertrat in hervorragender Weise Professor Carda, wie ich ein Schüler von Sophus Lie, aber auch von Czuber.

Ich knüpfte gute Beziehungen zu den Mathematikern Georg Pick und Josef Grünwald an, die an der Universität wirkten. Pick was eine vornehme Persönlichkeit mit ausgezeichneten Umgangsformen. Er hatte mit drei anderen Professoren, zu denen der Maschinenbauprofessor Camillo Körner gehörte, ein Quartett, das wunderbar spielte. Damals interessierte sich Pick für die Lieschen Theorien und las jedes Semester darüber. Er war ein ausgezeichnete Funktionentheoretiker im Riemannschen Sinne und hatte auch in Leipzig bei Felix Klein studiert. Er setzte in ausgezeichnete Weise die Tradition von Durège fort, dessen Bücher und Vorlesungshefte in der Seminarbibliothek aufgestellt waren. Es lebte damals

noch eine Tochter von Durège in Prag. Josef Grünwald hat schöne Arbeiten über die Parametrisierung der räumlichen Bewegungen geschrieben. Er war ein hochbegabter Mathematiker und ist leider in jungen Jahren an einer zu spät operierten Blinddarmentzündung gestorben, wie seinerzeit Minkowski. In einer seiner Publikationen weist er auf einen Fehler Sonja Kowalewskis hin. Es handelt sich um ein Problem der mathematischen Physik. Er meinte, daß auch in andern Arbeiten der gefeierten Mathematikerin Fehler steckten, z. B. in ihrer Abhandlung über den Saturnring. Vielleicht ist das aber eine Übertreibung. Josef Grünwald war sehr temperamentvoll. Als Sohn meines Vorgängers stand er mir besonders nahe. Sein älterer Bruder wurde einer meiner treuesten Freunde. Er war Dozent für Geometrie an der Technischen Hochschule oder, wie man in Österreich sagt, an der Technik, nebenbei auch Mittelschulprofessor. ([16, pp. 216–218])

Although Kowalewski did not teach descriptive geometry, he kept in contact with Prague descriptive geometers Eduard Janisch (1868–1915) and Karl Mack (1882–1943). He was interested in their results and lectures at the German Technical University in Prague as well as at the German University in Prague. He described this experience and some funny stories from Janisch’s lectures and the atmosphere of descriptive geometry exams as follows:

Professor Janisch hatte als darstellender Geometer, da er dieses umfangreiche Fach ganz allein vertrat, nur unterstützt von zwei guten Assistenten, eine ungeheure Arbeitslast auf sich. Dazu kam nun noch das Rektorat. Schließlich wollte er auch seine geometrischen Forschungen nicht ganz liegen lassen. Janisch war ein ausgezeichneter Geometer. Interessant war sein Diener Lang, der immer bei den Prüfungen sozusagen mitwirkte, weil oft Modelle aus den Schränken herauszuholen waren und die Tafel abgewischt werden mußte. Auch bei den Vorlesungen war Lang häufig anwesend. So kam es, daß er schließlich Menge Geometrie verstand, ganz ähnlich wie jener Schneidergeselle, dem der erblindete Euler seine Anleitung zur Algebra diktierte, mit der Zeit ein ganz tüchtiger Algebraiker wurde. Es kam vor, daß der Diener Lang am Schluß eines Examens zu seinem Professor sagte:

“Den dürfen wir nicht durchlassen. Er ist zu schwach in Axonometrie.” Janisch ließ sich solche Einmischungen gefallen und hatte seinen Spaß daran. Wer weiß, ob Lang nicht zu Hause heimlich Mathematik studierte. Er machte von allen Dienern den intelligentesten Eindruck. ([16, p. 224]).

Kowalewski helped young Prague mathematicians to obtain higher positions (for example Ludwig Berwald (1883–1942), Karl Löwner (1893–1968), Arthur Winternitz (1893–1961)).^{A.12} He was a friend of outstanding Prague physicist Philipp Frank (1884–1966), philosophers Oskar Kraus (1872–1942) and Christian von Ehrenfels (1859–1932). He regularly visited intellectual discussions in the salon of Fanta, a famous Prague Jewish family,³ where he also gave lectures on mathematics or philosophical questions of mathematics. He was personally associated with members of the Louvre Circle (an intellectual group connected with the famous Prague caffè called Louvre) and Prague intellectual elite, which included the writers Franz Kafka (1883–1924) and Max Brod (1884–1964), the philosopher, writer and librarian Hugo Bergmann (1883–1975), the anthroposophist and social reformer Rudolf Joseph Lorenz Steiner (1861–1925) and the physicist Albert Einstein (1879–1955).

In [16], Kowalewski mentioned his own role in the habilitation procedure of L. Berwald. He characterized and highly appreciated the position of Ph. Frank at the Prague scientific society, his education and works as well as his excellent style on teaching. On the other hand, he critically evaluated the character attributes, opinions and professional activities of Ch. von Ehrenfels. He also described Prague genius loci as follows:

Ich habe in Prag noch die Habilitation von Ludwig Berwald zur Verwirklichung gebracht, die vielleicht ohne meine ständige Ermunterung und ohne meine aktive Hilfe beim Habilitationsakt nie zustand gekommen wäre. So habe ich der mathematischen Wissenschaft einen bedeutenden Forscher und Lehrer zugeführt.

Als Nachfolger Einsteins beriefen wird Philipp Frank aus Wien. Er hatte dort eine ausgezeichnete Ausbildung in allen

³Berta Fanta (1865–1918) was a literary and intellectual figure from Prague. She was at the centre of the intellectual life in Prague and in her “salon” she organised get-together parties. The various topics discussed there included philosophy, science, literature, and Islam. But the meetings were not limited only to intellectual or spiritual pursuits. Some social evenings had artistic or musical flavour.

Zweigen der Physik genossen und war auch ein tüchtiger Mathematiker. Neben ihm kam auch Ehrenfest in Frage, ein äußerst impulsiver Herr. Er hielt noch vor Einsteins Abgang in unserm Prager Kolloquium einen wunderbaren Vortrag über Strahlungsprobleme. Die weitere Entwicklung war dann so, daß Einstein der Lehrstuhl des berühmten holländischen Physikers H.A. Lorentz angeboten wurde, der in der Ruhestand trat. Da Einstein lieber nach der Schweiz ging, gab er Lorentz den Rat, Ehrenfest zu nehmen, was dann auch geschah. So blieb uns Philipp Frank allein als Einsteins Nachfolger übrig. Lorentz muß man als einen Vorläufer Einsteins betrachten. Sein "Versuch einer Theorie der elektrischen und optischen Erscheinungen in bewegten Körpern" beschäftigte sich mit denselben paradoxen Tatbeständen wie Einsteins Relativitätstheorie, die ihn aber weit überholte. Das Bessere ist ein Feind des Guten. Philipp Frank hat in Prag eine starke Wirkung geübt. Sein Vortrag zeichnete sich durch Ruhe und Klarheit aus. Am Anfang jeder Stunde gab er einen kurzen Überblick über das zuletzt Vorgetragene. Frank hat sich auch auf dem Gebiete der Naturphilosophie betätigt. Außerdem war er ein Sprachengenie. Er beherrschte das Arabische und Syrische. Auch Frau Professor Frank, eine geborene Gerson, war von überlegener Klugheit. Beide erschienen auch oft auf den Vortragsabenden der Frau Fanta. Ich erinnere mich noch eines eindrucksvollen Vortrags über Relativbewegung, den Philipp Frank dort hielt. Baron Ehrenfels trat ihm mit scharfer Kritik gegenüber und suchte den Begriff der absoluten Bewegung zu retten. Viel wurde hin und her debattiert, ob man in der Physik ein absolutes Bezugssystem nötig hätte. Es kam keine Einigung zustande. Der Philosoph war unnachgiebig. Er hatte etwas von Carl Neumanns Körper Alpha gehört und schien zu glauben, das Dogma vom Körper Alpha wäre noch immer in Geltung. ([16], pp. 259–260)

As we can read in Kowalewski's memoirs, he was strongly interested in the so-called natural philosophy and moral philosophy, history of science, discussions on the theory of relativity and modern physics. In [16], he mentioned for example the disputes between O. Kraus and A. Einstein about the correctness of the theory of relativity which took place at parties of B. Fanta in Prague and at the conference of the Kant Society in Halle. He criticized Kraus' insufficient science education, lack

of his mathematical and physical knowledge and using of philosophical arguments and legal skills to support his views on the nature of physical phenomena.

Einstein hat in Prag einen grimmigen Gegner gefunden in dem Philosophen Oskar Kraus, dem schon einmal erwähnten eingeschworenen Brentanisten. Kraus war ursprünglich Jurist gewesen und hatte als solcher bereits eine Stellung bei der Finanzprokuratur bekleidet. Nebenbei hatte er sich auch als Dichter betätigt. In Reclams Universalbibliothek ist sein berühmtes Epos, die Meyeriade, erschienen. Kraus besaß an naturwissenschaftlichen und mathematischen Kenntnissen nur die spärlichen Erinnerungsreste aus der Schulzeit. So ausgerüstet stürzte er sich in den Kampf um die Relativitätstheorie, die er nur aus einer kleinen populären Schrift Einsteins kannte. Als Jurist klammerte er sich an Worte und suchte Widersprüche zwischen irgendeinem Satz auf Seite x und einem auf Seite y herauszupräparieren. In Prag hatte er mehrfach öffentliche Disputationen mit Einstein, bei denen natürlich nichts herauskam. Am Schlusse eines solchen Diskussionsabends gab Einstein ein kleines Violinkonzert. Das war der einzige Genuß, den dieser Abend dem Publikum brachte. Ich habe bei einer Tagung der Kantgesellschaft in Halle Gelegenheit gehabt, die Kraussche Einsteinkritik näher kennen zu lernen. Es trat dort ein Physiker gegen den streitbaren Philosophen auf und sagte ihm ganz offen, daß er über physikalische Dinge doch nicht mitreden könnte. Einsteins Theorie ließe sich nicht durch logische Spitzfindigkeiten, sondern nur durch mathematisch-physikalische Argumente widerlegen. Wenn irgendeinmal ein Experiment gemacht würde, dessen Resultat wesentlich anders ausfiele, als Einsteins Theorie es voraussagte, dann wäre das eine bessere Widerlegung als irgendein noch so geistreiches Geschwätz. Der Kritiker, dessen Namen ich nicht mehr weiß, sprach mit großem Nachdruck und erntete starken Beifall. Die Kraussche Antwort machte wenig Eindruck. Er hatte in diesem philosophischen Kreis sicher ganz etwas anderes erwartet. Der große Kant erlebte einmal etwas Ähnliches, als er sich mit seiner neuen Schätzung der lebendigen Kraft aufs physikalische Gebiet wagte. Da hieß es: "Kant schätzt die lebendigen Kräfte, nur seine eignen schätzt er nicht." Das wurde dem brabaven

Kraus, der manchmal an seelischen Depressionen litt, von seinen Prager Freunden zum Trost vorgehalten. Sie ahnten allerdings nicht, wie hoch erhaben über Kant sich dieser Brentanist vorkam. ([16, pp. 260–262])

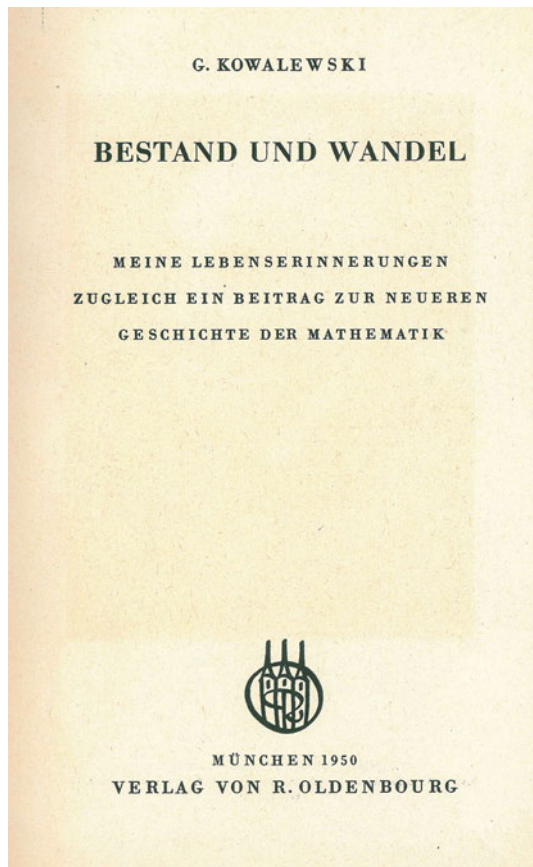


Photo 3: The front page of Kowalewski's memoirs (1950).

3. Kowalewski's period in Dresden (1920–1939). Already in 1919, G. Kowalewski informed his colleagues that he wanted to leave Czechoslovakia and continue his teaching activities in Germany. In 1920, he decided to leave Czechoslovakia. His intention was to live in Germany. His decision was discussed at the professors' meetings in 1919, 1920, 1921 and 1922.^{A.13} According to the Prague police records, G. Kowalewski terminated his first stay in Prague on October 7, 1920.⁴

⁴See the Prague police records – “register card Kowalewski G.”, *Osobní evidenční karty, fond PR – EO, Policejní ředitelství Praha II – evidence obyvatelstva*, National Archive of the Czech Republic.

Kowalewski went to Dresden, where he acquired the position of an ordinary professor of mathematics (*Professor für reine Mathematik*) at the famous Technical University. Two of his most talented Prague students, Joseph Fuhrich (1897–?) and Amelie Weizsäcker (1898–?), joined him.⁵ From 1920 until 1937/1938, Kowalewski taught in Dresden. Among his successful students, we can find topologists William Hugo Richard Maximilian Threlfall (1888–1949), Johannes Herbert Seifert (1907–1996), Hilmar Wendt (1913–2002) and an applied mathematician Emil Richard Alfred Kneschke (1912–1979).

In Dresden, Kowalewski founded and run the special (and famous) *Mathematisches Kolloquium* (together with his colleagues M.O. Lagally (1881–1945) and W. Ludwig (1876–1946)),⁶ which provided a forum for younger colleagues to present a wide spectrum of mathematical topics. The seminar was created in 1920 and its activities started in 1921. The seminar kept a close relation with the German mathematical society (*Deutsche Mathematiker-Vereinigung*) and with the local society called the *Naturwissenschaftliche Gesellschaft Isis in Dresden* (founded in 1833). This was a way to bring mathematicians, physicists, geometers, engineers, professors, assistants, students and secondary schools teachers together.⁷

During that time Kowalewski supported the women's ambition to study (the first woman employed as an assistant in the mathematics department of the Technical University in Dresden collaborated with him).⁸ He had two female assistants in Dresden. From 1923 until 1926 and from 1928 until 1938, Gertrud Wiegandt (1898–1983), Kowalewski's doctoral student who finished her doctoral procedure in Dresden in 1924, was his first assistant. From 1926 until 1928, Martha Elisabeth Junge (1899–1983), a doctor of mathematics at the University in Gießen, was his second assistant.⁹

In the early 1930s, he emerged as one who persuaded women at German universities to become doctors of mathematics. Let us note that at the Technical University in Dresden, Kowalewski was the “Doktor-

⁵For more information about J. Fuhrich and A. Weizsäcker, see [4].

⁶O.M. Lagally was a professor of applied mathematics (*Professor für angewandte Mathematik*) and W. Ludwig was a professor of descriptive geometry (*Professor für darstellende Geometrie*).

⁷For further information about Kowalewski's activities at the Technical University in Dresden, see [22], [23] and [25].

⁸For more information about women's studies of mathematics at German universities, see [1]. For more information about Kowalewski's support of women's studies, see [6], [25] and [26].

⁹For more information about Gertrud Wiegandt, Kowalewski's assistant, see [26].

vater” of 4 female doctors in mathematics (Gertrud Wiegandt (defence in 1914), Suse Weiner (defence in 1924), Hildegard Luther (defence in 1924), Elisabeth Steude (defence in 1930)), and the “Doktorvater” of 7 male doctors in mathematics (Rudolf Worlitzsch (defence in 1921), Alwin Oswald Walter (defence in 1922, later became a professor of mathematics at the University in Darmstadt, where he had more than 20 doctoral students and many descendants), Wilhelm Vauck (defence in 1924), Bernhard Bruder (defence in 1930), Rudolf Rost (defence in 1933), Martin Böhme (defence in 1934), Waldemar Ortlepp (defence in 1935)). Most of his doctoral students were interested in various kinds of transformations, natural, affine or projective geometry and function theory. As the second examiner, he evaluated theses of 2 female doctors in mathematics (Ingeborg Ginzel (defence in 1930/1931) and Anneliese Heede (defence in 1931)) and theses of 2 male doctors in mathematics (Johannes Gäbler (defence in 1931), Johannes Silbermann (defence in 1933)).¹⁰

Kowalewski was in close contact with his Jewish colleagues and students. He had no interest in politics.¹¹ For him, the most important thing was the love of mathematics, mathematical studies, results, which fascinated and associated him with his friends much more than other matters could divide them.

In 1926, Kowalewski became a member of the Saxon Academy of Sciences (*Sächsische Akademie der Wissenschaften zu Leipzig*). From May 2, 1927 until September 10, 1939, he was its ordinary member. Due to his living in Prague, the status of that Academy and the postwar situation in Germany, from September 10, 1939 until his death, he was its corresponding member. In 1927, he was elected a member of the Mathematical Society in France (*Société Mathématique de France*). In 1927, he was awarded the *Lobachevsky Diploma*, which received for his work on *natural or intrinsic geometry*.^{A.14}

In the 1920s and 1930s, Kowalewski’s older textbooks were reprinted and he wrote new textbooks for his students (for example *Integralgleichungen* (1930), *Alte und neue mathematische Spiele. Eine Einführung in die Unterhaltungsmathematik* (1930), *Einführung in die Theorie der kontinuierlichen Gruppen* (1931), *Vorlesungen über Allgemeine natürliche Geometrie und Liesche Transformationsgruppen* (1932), *Interpola-*

¹⁰For more information, see [26] and the Mathematics Genealogy Project (<http://www.genealogy.ams.org> [27.5.2018]).

¹¹For more information, see [16], where Kowalewski described his contacts with his female students as well as his contacts with his Jewish colleagues (for example pp. 194, 206, 278–280).

tion und genäherte Quadratur. Eine Ergänzung zu den Lehrbüchern der Differential- und Integralrechnung (1932), *Lehrbuch der höheren Mathematik für Universitäten und Technische Hochschulen* (1933), *Magische Quadrate und magische Parkette* (1937), *Der Keplersche Körper und andere Bauspiele* (1938), *Grundbegriffe und Hauptsätze der höheren Mathematik insbesondere für Ingenieure und Naturforscher* (1938)).

Kowalewski was interested in mathematical game theory, Lie groups, geometrical transformations, integral equations and history of mathematics. His two papers *Über Bolzanos nichtdifferenzierbare stetige Funktion* (1922)¹² and *Bolzanos Verfahren zur Herstellung einer nirgends differenzierbaren stetigen Funktion* (1923)¹³ are related to his stay in Prague and his contacts with his Prague colleagues. He found his inspiration in the work of Czech mathematicians, as for as example Martin Jašek (1879–1945), Karel Rychlík (1885–1968) and Vojtěch Jarník (1897–1970). Kowalewski was interested in Bolzano's famous example of a continuous non-differentiable function, the so-called Bolzano's function. He discussed Bolzano's work with his brother Arnold (see [4] and [16]).^{A.15} Kowalewski was also in touch with the mathematician Saly Ramler married Struik (1894–1993), the first woman doctor in mathematics at the German University in Prague, who collaborated with Martin Jašek, a recognized Czech teacher of mathematics, physics, philosophy and propedeutics at the secondary girl school in Pilsen, who was interested in mathematical heritage of Bernard Bolzano. As we know, Saly Ramler spoke and wrote fluently in Czech, German, Italian and French (later in English, too) and she was interested in history of mathematics.¹⁴

In Dresden, Kowalewski proposed the topic on a continuous non-differentiable function to his student Wilhelm Vauck (1896–1958) who defended under his supervision the thesis *Versuch einer Verallgemeinerung der stetigen nirgend differenzierbaren Funktion Bolzanos* in 1924.^{A.16}

After Hitler's accession to the power, Kowalewski joined the *Nationalsozialistische Deutsche Arbeiterpartei* (the NSDAP). He was the member from May 1, 1933, the number of his membership card was 2 448 572.¹⁵ Although he continued to meet his Jewish colleagues and friends, he supported Nazism and started to push the fascist ideology. On No-

¹²Berichte über die Verhandlungen der Sächsischen Akademie der Wissenschaften zu Leipzig, *Math.-phys. Klasse* 74 (1922), pp. 91–95.

¹³*Acta Mathematica* 44 (1923), pp. 314–319.

¹⁴For more information about Saly Ramler, see [5]. For more information on history of the study of Bolzano's mathematical works, see [8].

¹⁵Adolf Hitler (1889–1945) won the elections on March 5, 1933.

vember 11, 1933, he took part at a ceremonial meeting of German professors from universities and polytechnics organised in the Albert Hall in Leipzig, where the oath of the German scholars to A. Hitler was sworn (the so called *Das Bekenntnis der Professoren an den deutschen Universitäten und Hochschulen zu Adolf Hitler und dem nationalsozialistischen Staat*, in English the *Loyalty Oath of German Professors to Adolf Hitler and the National Socialist State*). It was signed by more than 300 scientists (for example by the mathematicians E. Artin, W.J.E. Blaschke, G. Bol, W. Cauer, H. Hasse, E. Hecke, O. Hölder, P. Koebe, G.H.W. Kowalewski, M. Krafft, W.H.H. Petersson, F. Schilling, J. Sommer, W. Weber). Some of them were not followers of the fascist ideology; they were there as the representatives of their schools (for example E. Artin). Kowalewski delivered a speech, in which he pronounced the famous sentence: *Adolf Hitler has been sent to us by Providence.*¹⁶

In 1935, Kowalewski became a rector of the Technical University in Dresden. Let us quote some words from the book of S.L. Segal:

... In March 1935, Gerhard Kowalewski, a distinguished geometer, was under consideration as Rektor at the technical university in Dresden (and therefore, in the Nazi interpretation of the Rektor's position, effectively Führer of the university). An old acquaintacquaintance (and apparently old Nazi), the engineer Hermann Alt, wrote to the Nazi leadership in Saxony (after validating Kowalewski as scholar and colleague):

Especial weight is to be given the question of K[owalewski's] relationship to the National Socialist movement. Indeed, only after the Führer's seizure of power, did K[owalewski] become a member of the NSDAP. Nevertheless, in his personality structure (menschlichen Struktur) he is already a born National Socialist. In all questions of National Socialist thinking he is completely sure, unquestionably reliable, loyal, and not inclined to compromise. In his great human maturity he is free of a personal desire for self-promotion. His inner stance is characterized by the thought that he feels the ability to serve the Führer and National Socialism as providential (als seine gütige Fügung). He would accept appointment as Rektor and perform this office in this spirit.

¹⁶See for example [20, p. 78], or V. Klemperer: *LTI*, Röderberg-Taschenbuch, no. 25, Paul-Rugenstein, Köln, 1987, p. 122.

... Solely and alone through the appointment of Kowalewski as rector would a guarantee be offered that the National Socialist spirit will prevail at the Technical University of Dresden. Against this winning out of the National Socialist spirit are the circles that inwardly are not able to be satisfied with National Socialism, and that, naturally, reject party-member Prof. Kowalewski as Rektor on account of his clear and goal-centered National Socialist bearing. ([20, pp. 179–180]).

However, soon Kowalewski¹⁷ lost a support of the boss of the NSDAP in Dresden. There are various myths as to why Kowalewski lost a support of the boss of the NSDAP in Dresden. Usually, it has been attributed to: his inability to prove his Aryan roots, an exaggerated support of his former students (based on denunciations of his colleagues) and his dubious personal life (a kind of “bigamy”).^{A.17} Kowalewski described his problem by these words: *Hitlers Herrschaft brachte einen tiefen Einschnitt in unser Leben: weil ich den Ariernachweis nicht vollständig erbringen konnte, begannen für mich berufliche Schwierigkeiten, die schließlich dadurch ihr Ende fanden, daß Prager Freunde mich 1939 an die dortige deutsche Universität beriefen. Über diese zweite Prager Zeit habe ich nicht viel zu berichten.* ([16, p. 309]) In reality, he should have no problem to prove his family roots, that is Aryan roots, as we could deduce from his brother’s case in Königsberg and from his official documents deposited in Berlin which he filled up and signed.^{A.18}

In 1937, he left his post at the Technical University and went on a two-year long leave (at his own “voluntary and free” request). At the website with the adress https://de.wikipedia.org/wiki/Gerhard_Kowalewski [21.2.2018], we can read the following words (some of them (on his situation in Dresden and on his military service) are not justified as we will show below): *1938 wurde gegen ihn ein Verfahren “wegen Untreue” eingeleitet, aus dem er letztlich aber straffrei hervorging. Nachdem Kowalewski in Dresden suspendiert war, übernahm er von 1939 bis 1945 wieder ein Ordinariat an der Technischen Hochschule Prag. 1941 wurde er vom Oberkommando der Marine eingezogen. Er arbeitete zunächst für den Marinewetterdienst, danach für das Marineobservatorium in Greifswald. 1943 wurde er für wehruntauglich erklärt.*^{A.19}

From 1937 until 1939, Kowalewski lived in seclusion¹⁸ and finished

¹⁷Kowalewski was German Lutheran, but his name was hardly “Nordi” (it sounds like a Slavic name).

¹⁸Kowalewski was on his “extraordinary leave” until April 15, 1939. See the letter of Saxon Ministry of Education, which is deposited in Kowalewski’s personal folder

his well-known book *Große Mathematiker: Eine Wanderung durch die Geschichte der Mathematik vom Altertum bis zur Neuzeit* (1938),¹⁹ which is devoted to the lives and works of the most renowned mathematicians.

Kowalewski described Greek mathematical discoveries made by Thales, Anaximander, Pythagoras, Hippocrates, Eudoxos, Euclid, Archimedes, Apollonius, Menelaus, Pappus and Diophantus, the most important and largely unknown results of Byzantine mathematics (made by Moschopoulos), the stagnation of mathematics in the Middle Ages, the development of mathematics in the Renaissance (the works of N. Cardano, Rhaeticus, J. Faulhaber of Ulm, M. Stifel, J. Napier, H. Briggs). He analysed the birth of modern mathematics, works and results of R. Descartes, P. Fermat, G. Galilei, Ch. Huygens, I. Newton, G.W. Leibniz, Bernoulli's family (Jacob I., Johann I.), J. le Rond d'Alembert, C. Maclaurin, L. Euler, J.H. Lambert, J.L. Lagrange, P.S. Laplace, G. Monge, J.F. Pfaff, K.F. Gauss, and A.-L. Cauchy. As we can see, he wrote about German, English, Italian, French and Dutch mathematicians. He stopped his work in the middle of the 19th century.

It is interesting that, in his foreword, Kowalewski recalled his mathematical lectures and seminars in Leipzig, Greifswald, Bonn and especially in Prague. He made some historical comments and he emphasized his inspiration by Ernst Mach (1838–1916), a famous experimental physicist at the German University in Prague (from 1867 until 1895) as well as a philosopher at the University in Vienna. For Kowalewski, the most important points of view were the mathematical results; no national, political or ideological ideas had a place in his book.

Kowalewski's book is in strong contrast with the book *Große Naturforscher. Eine Geschichte der Naturforschung in Lebensbeschreibungen*²⁰ written by Philipp Eduard Anton Lenard (1862–1947), a great German-Hungarian physicist, the winner of the Nobel Prize for Physics in 1905 for his research on cathode rays, a big critic of the theory of relativity and modern physics, a strong nationalist and anti-Semite, an admirer of the fascist ideology, a supporter of A. Hitler and a very active member of the NSDAP. The different style selection of scientists and evaluation

nr. R31/582, the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen, R31*, Bundesarchiv, Berlin-Lichterfelde, Germany.

¹⁹J.F. Lehmanns, München, Berlin, 1938, 300 pages.

²⁰See first edition, Lehmanns, München, 1929, 324 pages, second revised edition, Lehmanns, München 1930, revised version titled *Große Naturforscher. Eine Geschichte der Naturforschung in Lebensbildern*, third edition, 1937, fourth edition, 1943.

of their results (with the stress to the nationalities and Adolf Hitler's quotations and ideas) can be found there. Ph. Lenard despised "English physics" and he hated "Jewish physics" which he considered to have stolen their ideas from Germany. From the 1920s, he was in close touch with the NSDAP and later, he became the leader of Aryan physics. He was one of the fathers of the anti-Semitic journal *Deutsche Physik*, where he published his anti-Semitic articles. Let us note that Lenard's book *Große Naturforscher* was translated to English (also to Czech) and it was widely read and discussed at English schools and universities after WWII.²¹

Große Mathematiker

Eine Wanderung durch die Geschichte der Mathematik
vom Altertum bis zur Neuzeit

Von

Dr. Gerhard Kowalewski

ord. Professor an der Technischen Hochschule
in Dresden

Mit 35 Textfiguren und 16 Kunstdrucktafeln



J. S. Lehmanns Verlag, München / Berlin 1938

Photo 4: The front page of Kowalewski's book on the history of mathematics.

²¹For more information on activities and ideas of Philipp Eduard Anton Lenard, see for example https://en.wikipedia.org/wiki/Philipp_Lenard [21.5.2018].

In that time, Kowalewski also started to write his memoirs *Bestand und Wandel – Meine Lebenserinnerungen, zugleich ein Beitrag zur neueren Geschichte der Mathematik*, in which he described his life from his birth until his second stay in Prague. They were published in München in 1950.

At the end of Kowalewski's last textbook *Zur Analysis des Endlichen und Unendlichen. Vorlesungen aus Kurzsemestern von Dr. Gerhard Kowalewski vormals Professor der Mathematik an der Deutschen Universität und an der Deutschen Hochschule Prague* (Verlag R. Oldenbourg, München, 1950, 274 pages), there is an interesting advertisement of Kowalewski's memoirs in print:

Von gleichen Verfasser erschien: Bestand und Wandel – Meine Lebenserinnerungen zugleich ein Beitrag zur neueren Geschichte der Mathematik, 311 Seiten mit 1 Abbildung, Gr. – 8⁰, 1950, Halbleinen DM 14. – Der bekannte Mathematiker erzählt in ansprechendster Form seinen Werdegang von seiner Kindheit in Pommern und Westpreußen an bis zu seiner Flucht aus Prag 1946. Als Dozent und Professor in Leipzig, Greifswald, Prag und Dresden begegnete er vielen berühmten Persönlichkeiten, über die er fesselnd und humorvoll zu plaudern weiß. Die eingestreuten mathematischen Abschnitte wenden sich naturgemäß besonders an den Fachmann. Doch im Ganzen gesehen ist das Buch ein lebhafter Spiegel der vergangenen Jahrzehnte und wird daher von jedem mit Vergnügen und Gewinn gelesen werden.

The text of the advertisement probably served as a main source of frequent quotations (see, for instance, [7] and [9]) on Kowalewski's complicated departure (or escape) from Prague which is not right; see Section 6.

At that time, he probably faced personal problems: the lack of money, a life in two families (one with his lawfully wed wife Anna née Goldsmith (1876–?), a second one with his cousin Marie née Kowalewski (1890–1975) and their two common illegitimate children Sabina (born between 1924 and 1929, later she became a neurologist) and Guntram (born 1930), a complicated divorce, the new secret civil wedding etc.

Let us briefly recapitulate that Anna Kowalewski née Goldsmith came from a very rich Prague catholic family. Gerhard Kowalewski liked to use his wife's money and liked to live in luxury (large flats, travelling, parties and social evenings, visiting luxurious hotels and restaurants,

theatres and service of maids). He wrote about his comfortable and pleasant life in Prague and Dresden in his memoirs (see [16]).

In 1937, Anna Kowalewski opened a long lasting civil process to show immoral life of her husband. She did not want to divorce, she only wanted to get back her money, marriage portion and inheritance, and she also wanted to obtain her lifelong pension from her husband. Gerhard Kowalewski had two lives for many years. After repeated attempts to solve this situation and many social scandals, Anna decided to put him to a big shame, to discredit him and to prepare him a real hell on the earth.^{A.20} Although they were divorced in August or September 1939 and they had no child, she kept accusing him and reopening the civil processes until the end of the year 1944.^{A.21} Anna Kowalewski probably perished during the devastating British-American bombing of Dresden in February 1945.

Gerhard Kowalewski married Marie née Kowalewski on September 20, 1939 before his return to Prague. But only on April 18, 1945, for the first time, he filled in and confessed in his official personal questionnaire (to obtain an increase of the salary beginning of June 1, 1945!) that he is married, his wife Marie and their two legitimate children lived in Dresden. We do not know the reason for such a decision.²²

4. Kowalewski's second period in Prague (1939–1945).

It is not known if Prague has shown an interest in Kowalewski's teaching activities. According to the archival materials, the German University in Prague did not ask for his call to Prague.²³ Kowalewski was sent to Prague by the Ministry of Science, Education and National Culture in Berlin to serve the fascist ideology and German interests (for

²² For more information, see [4], where a rich material from Kowalewski's personal folder nr. R31/582 deposited in the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen, R31*, Bundesarchiv, Berlin-Lichterfelde, Germany, are quoted.

²³ For more information, see documents deposited in the Archive of Charles University (the folders: *Obsazování stolic Přírodovědecké fakulty Německé univerzity v Praze* (Filling of Chairs at the Faculty of Science of the German University in Prague), box nr. 107, the item C2/3, 1939–1945, the "funds" *Rektorát Německé univerzity v Praze* (Rector's Office, German University in Prague), *Obsazování stolic 1939–1945* (Filling of Chairs), box nr. 15, the "funds" *Úřad kurátora německých vysokých škol v Praze* (Office of the Curator of German Universities in Prague), *Ústav 1939–1945* (Institutes 1939–1945), box nr. 5, the folder *Mathematisches Institut 11-07-02*, the "funds" *Úřad kurátora německých vysokých škol v Praze* (Office of the Curator of German Universities in Prague)). For more information on the staff at the Mathematical Institute of the Faculty of Science of the German University in Prague during the war time, see [4].

more information about the political and ideological conditions of appointment to Prague schools, see [17]). He was appointed an ordinary professor of mathematics at the University in Prague by Bernhard Rust (1883–1945), the Minister of Science, Education and National Culture in Berlin (*Reichserziehungsminister*). His decree did not contain a usual specification whether the appointment is meant for the German Technical University in Prague or for the German University in Prague (there were two different decrees, one for the professorship at the German Technical University in Prague and one for the professorship at the German University in Prague (nr. Z III. 2123 from September 9, 1939)).²⁴ He was teaching in Prague from November 1939²⁵ till May 1945. He was a member of the professorial staff at the German University in Prague and at the German Technical University in Prague.

On March 15, 1939, the Nazi occupation of Czech lands and Moravia started. In the spring of 1939, the German University in Prague was officially renamed to the *Deutsche Karls-Universität in Prag*. On September 1, 1939, it was directly subordinated to the *Reichsministerium für Wissenschaft, Erziehung und Volksbildung* and on November 4, 1939, it was proclaimed to be *Reichsuniversität*. Teaching at the German University in Prague took place until the end of the World War II, but this school was out of interest of German scientists as well as Berlin's authorities. In May 1945, the German University in Prague was abolished by Czechoslovak authorities. On November 17, 1939, the Czech University (Charles University) and all other Czech higher-education institutions were closed by Nazis, originally for three years. However, they remained closed until the end of the World War II.

In 1939, Kowalewski, as an experienced and skilled professor of mathematics, was sent to Prague by the Ministry of Science, Education and National Culture in Berlin. Although it may have been a political

²⁴For more information, see documents (as for example Kowalewski's personal questionnaires, copies of ministerial decrees, letters among both German universities in Prague and Ministry Science, Education and National Culture in Berlin), which are deposited in Kowalewski's personal folder nr. R31/582, the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen, R31*, Bundesarchiv, Berlin-Lichterfelde, Germany.

²⁵Kowalewski arrived to Prague on November 6, 1939 (see the Prague police records – "register card Kowalewski G.", *Osobní evidenční karty, fond PŘ – EO, Policejní ředitelství Praha II – evidence obyvatelstva*, National Archive of the Czech Republic). He lived alone in Prague-Dejvice. In the register card, he wrote that he is a German citizen, professor at the German University in Prague, divorced and evangelic.

punishment, it was also a new chance for his next career. From September 1939 until May 1940 Kowalewski taught mathematics at both universities (at the German Technical University in Prague, he preplaced professor P.G. Funk, at the German University in Prague, he prelaces professor L. Berwald and professor K. Löwner, who lost their positions because of their Jewish origin).

The official teaching duty at the German University in Prague took about 15 hours per week. Two full professors and several docents alternated in the so-called basic courses in two- or three-year cycles.²⁶ In comparison to the period of the World War I and the period between the wars, there was a significant “internal isolation” of mathematicians when everyone acted, taught and performed research on his own. This situation was also caused by the fact that a very nonhomogenous group of people had met in Prague: active Nazi followers, people who worked in Prague rather as a “punishment”, people hiding their personal problems (e.g. non-Aryan origin, health indisposition), young careerists, talented mathematicians cut off from normal life and very uneducated in politics and also naive.²⁷

The same situation was at the German Technical University. The official teaching duty there was around 15 hours per week, two professors and several assistants alternated in the basic courses in every two year cycle.

From 1939 till 1940, Kowalewski taught mathematics at the German University in Prague and the German Technical University in Prague because of lack of experienced mathematicians in Prague. He had between 12 and 18 hours per week at the German Univeristy in Prague and between 10 and 14 hours per week at the German Technical University in Prague. He earned two salaries. From 1940 till 1941, Kowalewski was the director of the Mathematical Institute of the Faculty of Science of the German University in Prague.

In 1940, thanks to the arrival of Wilfried Hans (Johann) Henning Petersson (1902–1984), the situation changed.²⁸ On May 20, 1940, Kowalew-

²⁶Kowalewski’s lectures and seminars at the German University in Prague from 1939 until 1945 are summarized in [4], where many information from *Ordnung der Vorlesungen an der Deutschen Universität in Prag im Wintersemester 1939–40*, Prag, 1940, *Deutsche Karls-Universität in Prag. Vorlesungsverzeichnis, Erstes Trimester 1940*, Prag, 1940, . . . , *Deutsche Karls-Universität Prag. Personal- und Vorlesungsverzeichnis*, Sommersemester 1945, Prag, 1945, are quoted.

²⁷For more information about the staff of the German University in Prague, see [4] and [17].

²⁸For more information about Petersson’s teaching in Prague, see [4].

ski was appointed the first professor of mathematics at the German Technical University (*Lehrstuhl für Mathematik I an der Deutschen Technischen Hochschule in Prag*). According to the ministerial decree, he was allowed to help with teaching at the German University in Prague in case of a need and in case of his interest. He did it until the year 1941, when Hans Joachim Albert Rohrbach (1903–1993) arrived to Prague and obtained the positions of the first professor of mathematics and the director the Mathematical Institute of the Faculty of Science of the German University in Prague.²⁹

In 1941, Kowalewski became ill (some heart problems) and his teaching duties at the German Technical University in Prague had to be taken by professor Ernest Lammel (1908–1961) and at the German University in Prague by docent Otto Varga (1909–1969).³⁰ It seems that Kowalewski had to finish his activities at the German University in Prague. At the same time, he was drafted by German army in spite of his illness.

In the spring 1942, the rectors of both universities, the curator of German universities in Prague and the Ministry of Science, Education and National Culture in Berlin prepared Kowalewski's retirement on health grounds. Kowalewski was asked whether he agreed or whether he wanted to continue his teaching activities and under what conditions. Kowalewski answered that he was ready to vacate his position in Prague for younger colleagues and collaborators if it was necessary. At the same time, he personally asked the Ministry of Science, Education and National Culture in Berlin for a special permission to continue his teaching activities in Prague because he needed money for his family. In that situation, both German universities in Prague declared Kowalewski's "indispensability" and they demanded his pedagogical service.

During the summer 1942, Kowalewski obtained the ministerial permission and he could continue to teach at the German Technical University. In the winter 1945, there was a lack of professors of mathematics in Prague and Kowalewski had to deliver basic courses also at the German University in Prague. In Prague, he stayed until the end of the war.³¹

It seems that during the World War II, Kowalewski was an apolitical person, he was not an active member of the NSDAP and he was not

²⁹For more information about Petersson's teaching in Prague, see [4].

³⁰For more information about E. Lammel and O. Varga, see [4].

³¹For detailed information, see materials from Kowalewski's personal folder nr. R31/582 deposited in the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen, R31*, Bundesarchiv, Berlin-Lichterfelde, Germany. See also [4].

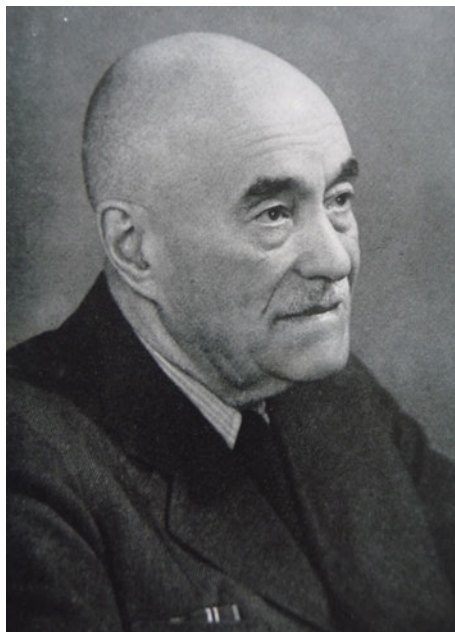


Photo 5: Gerhard Hermann Waldemar Kowalewski (Kowalewski's portrait is taken from [16], it was probably made at the end of 1940s).

asked for a more or less obligatory involvement of mathematicians in war research.³²

He supported his younger colleagues to obtain positions in Germany and he tried to avert their transfer to the Russian front.³³ He had to

³²For more information, see materials from Kowalewski's personal folder nr. R31/582 deposited in the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen*, R31, Bundesarchiv, Berlin-Lichterfelde, Germany, and documents (as for example the copies of Rohrbach's letters to Berlin) deposited in the folder *Ústavy 1939–1945* (Institutes 1939–1945), box nr. 5, the item *Mathematisches Institut 11-07-02*, the "funds" *Úřad kurátora německých vysokých škol v Praze* (Office of the Curator of German Universities in Prague), Archiv Univerzity Karlovy (Archive of Charles University). Hans Joachim Albert Rohrbach (1903–1993) was a German mathematician; from 1942 until 1945 he was the director of the Mathematical Institute of the Faculty of Science of the German University in Prague. On the situation at the German University in Prague, see also [17].

³³For more information about his support of Otto Varga, Gerhard Karl Erich Gentzen (1909–1945), Friedrich Kraus (born 1903, death after 1968) or Franz Krammer (1915–?), see [4]. See also the personal folders of G. Gentzen nr. R31/377, F. Kraus nr. R31/263, O. Varga nr. R31/452 and the folder of the Mathematical Institute of the Faculty of Science of the German University in Prague nr. R31/716 and nr. R31/717 deposited in the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen*,

solve the conflict with his first wife and he had also problems with Wilhelm Johann Eugen Blaschke (1885–1962), the famous German mathematician who strongly supported NSDAP ideology. In [20], one can find these words:

... In December 1940, Gerhard Kowalewski wrote Bieberbach from Prague complaining about Blaschke's treatment of another former student, a certain Otto Varga. At the time, Kowalewski was still recovering from a serious operation. Born in Hungary in 1909, Varga had proceeded via a Realgymnasium in Zips (in Slovakia) to the technical university in Vienna. From there he went to Prague, where he eventually completed his doctorate in 1934 at the German university. Between 1934 and 1936 he studied in Hamburg, wrote a paper together with Blaschke, and is mentioned a number of times in Blaschke's papers of this period. He then returned to Prague and "habilitated" at the German university in 1937. He had a differential geometry paper accepted in *Deutsche Mathematik*, which appeared in 1941. His published work was entirely in Blaschke's sort of differential or integral geometry. According to Kowalewski, Varga gave a quite original talk in integral geometry at Baden-Baden and, naturally enough, apparently sent Blaschke a manuscript of his talk. Blaschke asked him for a manuscript publishable in the *Hamburger Abhandlungen*. Varga replied that he had already sent it elsewhere. Many weeks later Varga received his manuscript back "with the dry remark" that in Hamburg similar results were already known. Then Blaschke published the same result, even using Varga's notation. Varga's paper appeared in an obscure journal published in Pressburg (modern Bratislava) with a footnote referring to his Baden-Baden lectures. Not only did Blaschke not cite Varga, but the two publications are said to be virtually identical. Varga naturally complained – but this only earned him Blaschke's dislike (and, after all, he was only a Prague Privatdozent, whereas Blaschke was an internationally known Hamburger professor). In fact, when Kowalewski enthusiastically recommended Varga for an open position at Braunschweig, and Blaschke heard of it, he apparently remarked to the Braunschweig authorities that "he did not know whether Varga

stood 100 % in agreement with the new state” – enough to prevent Varga from getting the position. Blaschke also tried (unsuccessfully) to prevent Varga from advancing academically within Germany itself, as he pressured Varga to accept a job in Pressburg, a suggestion Kowalewski called “rather shabby”. It was after this last, in early December, that Kowalewski wrote Bieberbach – writing early seems to have been delayed by illness.

The parallels with Knothe’s case are striking, including Blaschke’s reaction to assertions of intellectual independence by publication other than in his journal. In fact, Kowalewski said that, according to rumor, Blaschke had behaved similarly previously; apparently he was not talking about Knothe, as Bieberbach, in his reply, reviewed that case and its outcome, suggesting that Kowalewski writes the ministry about his new evidence of Blaschke’s behavior. ([20, pp. 413–414]).³⁴

Kowalewski evaluated doctoral theses in mathematics, which were defended at the German University in Prague from 1939 until 1945. He was a referee of the theses of Siegfried Krapf (1940), Rudolf Ullrich (1940), Herbert Oettel (1940) and Victor Lieblein (1941) and he was also their real “Doktorvater”. He took part in the examination committees of each first (main) oral examination in mathematics and physics.³⁵

5. Kowalewski’s textbooks and monographs. Kowalewski is the author of many mathematical articles (theory of group transformations, differential and integral equations, differential geometry, approximation theory and interpolation) and many textbooks.³⁶

In 1901, Kowalewski as a young gifted lecturer at the University in Leipzig translated Cesàro’s³⁷ famous book *Lezioni di geometria intrin-*

³⁴Herbert Knothe’s problem with W.J.E. Blaschke was also connected with Blaschke’s plagiarism. For accurate information on Otto Varga, see [4], for more information on Knothe’s problem see [20, pp. 410–412].

³⁵During the World War II, at the German University in Prague, there were only 5 doctoral procedures in mathematics; only one of them was unsuccessful (S. Krapf). For more information on the doctoral procedures in mathematics at the German University in Prague, see [4], where materials from *Protokoll über die Akte zur Erlangung der Doktorswürde an der naturwissenschaftlichen Fakultät der deutschen Universität zu Prag 1933/1934–1944/1945*, Archiv Univerzity Karlovy (Archive of Charles University), are quoted.

³⁶Kowalewski published 24 mathematical textbooks as well as more than 100 articles, see *Algmaine deutsche Biographie* or *Neue deutsche Biographie*.

³⁷Ernesto Cesàro (1859–1906) was an Italian mathematician who worked in dif-

seca,³⁸ which was published under the title *Vorlesungen über natürliche Geometrie*.³⁹ In 1926, Kowalewski as an experienced teacher at the Technical University in Dresden revised his first translation and added an appendix.⁴⁰ Edward Kasner wrote a review⁴¹ on Kowalewski's translation and evaluated his appendix as follows:

This is a reprint of the first edition of the German translation published in 1901. The new feature is a valuable appendix of Kowalewski on Generalized Natural Geometry. Although extremely short, occupying only pages 332 to 342, this gives a clear and interesting account of the important theories founded by Georg Pick in 1906 and later developed by some of his students and also by Kowalewski.

Natural or intrinsic geometry, in its original form, as studied by Cesàro, deals with the differential invariants of the group of euclidean motions. The generalization made by Pick is to a very large category of continuous groups, including for example the projective and inversion groups. For each r -parameter group G_r in the plane (assuming a certain transitivity condition) a differential invariant of lowest order J is founded (the analog of curvature), and also an integral invariant $s = \int \omega dx$ (the analog of arc length). The natural equation of a curve, relative to the given group, is then of the form $\Phi(J, s) = 0$. The curves defined by $J = \text{constant}$ are the analogs of the W or anharmonic curves of projective geometry. Kowalewski has discussed the more general category $J = as + b$ in the *Leipziger Berichte*, 1924.

Pick's fundamental discovery of covariant coordinates is the final topic. The extension to space of three dimensions, which he has treated in his lectures, is still unpublished. . . .

In 1904, during his time in Bonn, Kowalewski translated Cesàro's textbook *Corso di analisi algebrica con introduzione al calcolo infinitesimale*,⁴² that was published under the title *Elementares Lehrbuch* differential geometry.

³⁸Napoli, Presso l'autore-editore, 1896, 272 pages.

³⁹B.G. Teubner, Berlin, 1901, VII + 341 pages.

⁴⁰B.G. Teubner, Berlin, 1926, VI + 352 pages.

⁴¹E. Kasner: *Vorlesungen über Natürliche Geometrie. By Cesàro. German translation by Gerhard Kowalewski*. Berlin, B.G. Teubner, 1926. Second edition, VI + 352 pages, *Bulletin of American Mathematical Society* 36 (1), 1930, p. 32.

⁴²Bocca, Torino, 1894, VIII + 500 pages.

der algebraischen Analysis und der Infinitesimalrechnung mit zahlreichen Übungsbeispielen (nach einem Manuscript des Verfassers deutsch herausgegeben von Gerhard Kowalewski).⁴³ Cesàro's textbooks influenced Kowalewski's teaching and writing style.

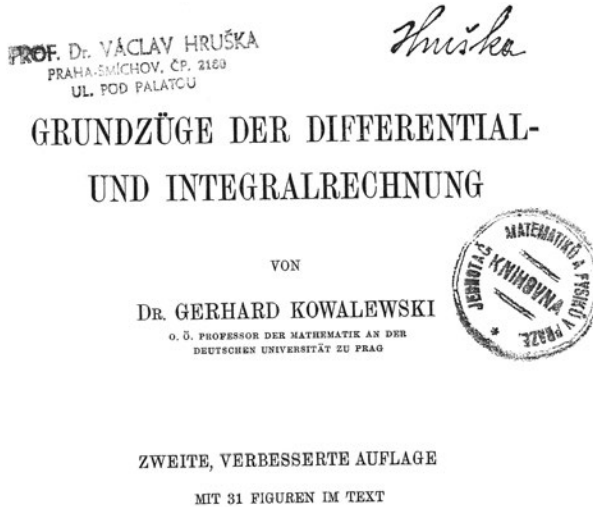


Photo 6: The front page of Kowalewski's textbook on calculus.

In 1908, Kowalewski published his first own textbook *Einführung in die Infinitesimalrechnung mit einer historischen Übersicht* [11], which was republished in the same title in 2017 (see [15]).

In 1908 still in Bonn, Kowalewski completed his mathematical textbook *Grundzüge der Differential- und Integralrechnung*.⁴⁴ The book was published in Leipzig by B.G. Teubner (Kowalewski's preferable publish-

⁴³B.G. Teubner, Leipzig, 1904, IV + 894 pages.

⁴⁴B.G. Teubner, Leipzig, 1909, 452 pages, second edition, B.G. Teubner, Leipzig, 1919, 416 pages. Other revised versions were published in 1923, 1928 and 1932 (B.G. Teubner, Leipzig, 416, 422 and 422 pages).

ing house) in 1909. He dedicated the textbook to Ernesto Cesàro, his Italian friend, collaborator and the man who inspired him very much.

During his first Prague period, Kowalewski wrote and published (or rewrote and republished) a textbook for students of mathematics and another one for future engineers. They became popular and were used as a basic source for several generations of mathematicians in the central Europe.

Kowalewski's monograph *Einführung in die Determinantentheorie, einschließlich der unendlichen und Fredholmschen Determinanten*^{A.22} was published four times, in 1909, 1925, 1942 and finally in 1954, four years after the author's death.

Let us remark that the book's preface reveals that Kowalewski started writing this textbook shortly after his arrival to Bonn and that he finished his manuscript in April 1909. His book was published immediately. Then, he rewrote the book omitting the section about the infinite determinants. He completed his second version in May 1924 in Dresden. The book was published one year later.

During the World War II, Kowalewski revised (enlarged) the second edition. In January 1942, he finished the third version, which was published in the same year in Prague. In the introduction to this version, Kowalewski writes:

... Meine Determinantentheorie gehört zu den zerlesensten und zerfetztesten Bücher der Seminarbibliotheken, wie ich von vielen Seiten höre, und auch jetzt bei meiner Rückkehr auf die Prager Professur wieder feststellen konnte.

Möchte auch die neue Auflage sich gleicher Beliebtheit erfreuen!

In a leisurely style, Kowalewski presented the theory of infinite determinants as well as some applications of matrices and determinants. The monograph influenced the acceptance of matrix theory in Germany and has, in particular, contributed to standardization of the matrix notation.⁴⁵

In 1910, Kowalewski finished in Prague and published in Leipzig his textbook *Einführung in die analytische Geometrie*.⁴⁶ Thanks to its readable style of interpretations and explanations, many pictures and

⁴⁵For the detailed analysis on Kowalewski's book on the theory of determinants and its role in the German algebra, see [2].

⁴⁶Veit & Comp., Leipzig, 1910, 360 pages, fourth edition W. de Gruyter, Berlin, 1953, 364 pages.

illustrative examples and counterexamples, the book was popular among students for more than 40 years. Its last revised edition was published in 1953, three years after the author's death.⁴⁷

Produkt zweier Tetraederinhalte 347

§ 142. Produkt zweier Tetraederinhalte.

T sei der Inhalt des Tetraeders

$$(x_0, y_0, x_0), (x_1, y_1, x_1), (x_2, y_2, x_2), (x_3, y_3, x_3)$$

und T' der eines andern Tetraeders

$$(x'_0, y'_0, x'_0), (x'_1, y'_1, x'_1), (x'_2, y'_2, x'_2), (x'_3, y'_3, x'_3).$$

Die Tetraederinhalte sind mit den zugehörigen Vorzeichen versehen.

Multiplizieren wir

$$6T = \begin{vmatrix} x_0 & y_0 & x_0 & 1 \\ x_1 & y_1 & x_1 & 1 \\ x_2 & y_2 & x_2 & 1 \\ x_3 & y_3 & x_3 & 1 \end{vmatrix} = \begin{vmatrix} x_0 & y_0 & x_0 & 1 & 0 \\ x_1 & y_1 & x_1 & 1 & 0 \\ x_2 & y_2 & x_2 & 1 & 0 \\ x_3 & y_3 & x_3 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 \end{vmatrix}$$

mit

$$6T' = \begin{vmatrix} x'_0 & y'_0 & x'_0 & 1 \\ x'_1 & y'_1 & x'_1 & 1 \\ x'_2 & y'_2 & x'_2 & 1 \\ x'_3 & y'_3 & x'_3 & 1 \end{vmatrix} = - \begin{vmatrix} x'_0 & y'_0 & x'_0 & 0 & 1 \\ x'_1 & y'_1 & x'_1 & 0 & 1 \\ x'_2 & y'_2 & x'_2 & 0 & 1 \\ x'_3 & y'_3 & x'_3 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0 \end{vmatrix},$$

so ergibt sich

$$-36TT' = \begin{vmatrix} x_0 x'_0 + \dots, x_0 x'_1 + \dots, x_0 x'_2 + \dots, x_0 x'_3 + \dots, & 1 \\ x_1 x'_0 + \dots, x_1 x'_1 + \dots, x_1 x'_2 + \dots, x_1 x'_3 + \dots, & 1 \\ x_2 x'_0 + \dots, x_2 x'_1 + \dots, x_2 x'_2 + \dots, x_2 x'_3 + \dots, & 1 \\ x_3 x'_0 + \dots, x_3 x'_1 + \dots, x_3 x'_2 + \dots, x_3 x'_3 + \dots, & 1 \\ 1 & , & 1 & , & 1 & , & 1 & , & 0 \end{vmatrix}$$

Dabei ist

$$x_r x'_s + \dots$$

eine Abkürzung für

$$x_r x'_s + y_r y'_s + x_r x'_s.$$

Versteht man unter d_{rs} die Entfernung zwischen den Punkten (x_r, y_r, x_r) und (x'_s, y'_s, x'_s) , so ist

$$\begin{aligned} d_{rs}^2 &= (x_r - x'_s)^2 + (y_r - y'_s)^2 + (x_r - x'_s)^2 \\ &= (x_r^2 + \dots) + (x'_s{}^2 + \dots) - 2(x_r x'_s + \dots). \\ -\frac{d_{rs}^2}{2} &= (x_r x'_s + \dots) - \frac{1}{2}(x_r^2 + \dots) - \frac{1}{2}(x'_s{}^2 + \dots). \end{aligned}$$

Photo 7: A page from Kowalewski's monograph *Einführung in die Determinantentheorie, einschließlich der unendlichen und Fredholmschen Determinanten* (1909). The product of volumes of tetrahedron expressed in terms of determinants.

⁴⁷It can be mentioned, that the version from the year 1953 was published from Kowalewski's revised manuscript which he finished in November 1949 in Gräfelfing bei München. On the front page, there is written *Gerhard Kowalewski* † which indicates that the book was published posthumously.

In 1910, Kowalewski published his booklet *Das Integral und seine geometrische Anwendungen*,⁴⁸ which he presented as an ordinary professor at the German Technical University in Prague. The book was written for the future mathematicians and natural scientists with the emphasis to include some recent mathematical results. In the introduction (which was finished in Prague in May 1910), one can find information on Kowalewski's ambitious writing plans as well as on his views on mathematical teaching and research. He also showed a very good knowledge of the latest mathematical developments (not only in Germany). He wrote these interesting words:

Diese Sammlung will dazu beitragen, die große Kluft zwischen Forschung und Studium zu überbrücken.

Der Universitätsunterricht bringt, wenn man von ganz bedeutenden Forschungs- und Arbeitszentren wie z. B. Göttingen absieht, die Studierenden in der Regel nicht so weit, daß sie die Fortschritte der mathematischen Wissenschaft mit einigem Verständnis verfolgen können.

Und doch wäre es ein unschätzbare Vorteil, wenn die Fortschritte auf dem Gebiete der Mathematik schneller und tiefer, als es jetzt geschieht, in das allgemeine mathematische Bewußtsein eindringen.

Unsere Monographie wollen dem Studierenden das Verständnis des Neuen in jeder nur möglichen Weise erleichtern. Deshalb legen wir den größten Wert auf Klarheit und Einfachheit der Darstellung, sowie auf die sorgfältige Durchführung der einzelnen Beweise.

Das erste Heft bringt die moderne Behandlung der einfachen und der Doppelintegrale, und es wird z. B. die Transformation der Doppelintegrale in völlig strenger und doch ziemlich einfacher Weise erledigt. Daß dies möglich ist, haben die Arbeiten der neueren französischen Forscher (z. B. die von Baire) gezeigt.

Das nächste Heft wird sich mit dem Legesgueschen Integral beschäftigen. Weitere Hefte sollen die quadratischen Formen mit unendlich vielen Veränderlichen, die Integralgleichungen, die Theorie von Fréchet, das Uniformisierungsproblem usw. zum Gegenstand haben.

⁴⁸*Forschung und Studium, Eine Sammlung mathematischer Monographien für Studierende*, Heft 1, Verlag von Veit & Comp., Leipzig, 1910, 85 pages.

As one could see from the earlier remarks and one will see in what follows, Kowalewski's writing plans were not infeasible dreams; he was able to publish most of his projected textbooks.

In 1910, Kowalewski published his large book *Die klassischen Probleme der Analysis des Unendlichen*.⁴⁹ As indicated in the introduction, he finished his manuscript in December 1909 in Bonn, thus shortly before his first sojourn in Prague. It is a reasonably good textbook on the basic concepts of calculus (sequences, series, products, complex functions, limits, differentiation, integration, double integrals, improper integrals).

In 1911 in Prague, Kowalewski finished his textbook *Die komplexen Veränderlichen und ihre Funktionen. Fortsetzung der Grundzüge der Differential- und Integralrechnung. Zugleich eine Einführung in die Funktionentheorie*.⁵⁰ He had contemplated writing this book already when he was at the University in Bonn. He finished the book in March 1911 when he taught at the German Technical University in Prague. In the introduction, he indicated his intentions to write this book, which was influenced by some positive reviews of his previous textbook:

Das vorliegende Buch ist in erster Linie als seine Fortsetzung der "Grundzüge der Differential- und Integralrechnung" zu betrachten, die ich ebenfalls im Teubnerschen Verlage erscheinen ließ. Die günstige Kritik, die dieses Buch seitens hervorragender Autoritäten (u. a. F. Engel, Jules Tannery, Wilh. Wirtinger, H. Hahn) erfahren hat, ermutigte mich zur Weiterführung des Werkes. Ich benutzte dabei mein Vorlesungsmanuskripte, und zwar über Infinitesimalrechnung und Funktionentheorie, und glaube, daß das Buch vielleicht auch als Einführung in die Funktionentheorie geeignet sein wird. Hiermit schließt die Reihe von Lehrbüchern, die aus meinen Universitätsvorlesungen entstanden sind.

Kowalewski used more than four hundred pages to explain the arithmetic of complex numbers, theory of basic complex functions of real variable, theory of complex functions of complex variable, curvilinear

⁴⁹*Ein Lehr- und Übungsbuch für Studierende zur Einführung in die Infinitesimalrechnung*, Verlag von W. Engelmann, Leipzig, 1910, VIII + 383 pages, second edition, W. Engelmann, Leipzig, 1921, 342 pages, 3rd edition, K.F. Koehlers Antiquarium, Leipzig, 1938, VIII + 404 pages.

⁵⁰B.G. Teubner, Leipzig, 1911, 455 pages, second edition B.G. Teubner, Leipzig, 1923, 455 pages.

integral, Cauchy's theorem and its consequences, series and products of functions and the Mittag-Leffler theorem) in an accessible way.⁵¹

In 1921, Kowalewski published in Leipzig his booklet *Mathematica delectans. Ausgewählte Kapitel aus der Mathematik der Spiele in gemeinverständlicher Darstellung*⁵² devoted to mathematical games and recreations. To put it simply, Kowalewski summarized in his book the material from his mathematical seminar, that took place at the German University in Prague in the summer semester 1916/1917 (he had the special lecture courses named *Über einige Spiele und ihre mathematische Theorie*) and in the winter semester 1919/1920 (he had the special lecture courses named *Mathematik der Spiele*).⁵³

In 1930, Kowalewski published a textbook *Integralgleichungen* (v. [14]). Kowalewski dedicated this book to Christian Hugo Eduard Study (1862–1930), Kowalewski's colleague in Greifswald and Bonn, a German mathematician known for his work on the invariant theory of ternary forms, for the study of spherical trigonometry, for contributions to space geometry, hypercomplex numbers, and criticism of early physical chemistry. In the introduction of the book, he explained why he had decided to write such a text and which parts are new there (the theory of Volterra's and Fredholm's integral equations):

Einige Kapitel meines im Jahre 1909 erschienenen Determinantenbuches waren die erste lehrbuchmäßige Darstellung der Theorie der Integralgleichungen in Deutschland. In der zweiten Auflage fiel, da sie stark gekürzt werden mußte, ein großer Teil dieser Kapitelreihe fort. Ich wurde wiederholt aufgefordert, ein besonderes Buch über Integralgleichungen zu schreiben. So ist das vorliegende Werk entstanden. Es ist als Buch für unsere Studierenden gedacht. Ich habe Wert darauf gelegt, alles möglichst einfach und natürlich herzuleiten und gut zu erklären. Die Theorie der Hauptkerne und Hauptfunktionen, ein Kernstück der Lehre von den Integralgleichungen, ist auf eine neue Weise dem Verständnis zugänglich gemacht. Hoffentlich wird sich mein Buch als zuverlässiger und bequemer Führer in diese große und so überaus wichtige

⁵¹It is interesting that on the front page of the second edition of Kowalewski's book *Die komplexen Veränderlichen und ihre Funktionen . . .*, Kowalewski is written as an ordinary professor at the German Technical University in Prague although the book was published in 1923 that is three years after his arrival in Dresden.

⁵²Heft 1, *Boss-Puzzle und verwandte Spiele*, W. Engelmann, Leipzig, 1921, 72 pages.

⁵³For more information, see [18, 19].

Disziplin bewähren. Dann wäre ich für eine vieljährige und entsagungsvolle Arbeit reich genug belohnt.

Let us point out that Kowalewski attached a list of basic references (see p. 300, where the contributions of F. von Hellinger, O. Toeplitz, A. Kneser, R.B. Heywood, M. Fréchet, D. Hilbert, R. Courant, and V. Volterra are quoted), which was rather unusual in those days.

In 1930, Kowalewski published a small monograph *Alte und neue mathematische Spiele. Eine Einführung in die Unterhaltungsmathematik*.⁵⁴ A new edition appeared under the same title in 1968⁵⁵ and was inspired by his lectures in Prague. It was devoted to recreational mathematics, more precisely to popular games (such as, for example, Nim, Fan-Tan, MacMahon Coloured Cubes, Peg Solitaire, Burr Puzzle, Polyiamonds, Dodecahedron problems, Hamilton's roundtrips). In the introduction, Kowalewski wrote:

Schon in Prag habe ich gelegentlich Vorträge über mathematische Spiele gehalten, die sich großer Beliebtheit erfreuten. Ich bin auch vor Jahren mit einer kleinen Publikation das Boß-Puzzle hervorgetreten. So ist mir das Gebiet der Unterhaltungsmathematik immer mehr vertraut geworden, und ich kann die Lücke, die durch den Tod meines Freundes W. Ahrens entstanden ist, vielleicht einigermaßen ausfüllen. Sein ungeheures historisches Wissen, die Frucht jahrzehntelanger Studien, kann allerdings schwer ersetzt werden. Dafür biete ich hier eine stoffliche Bereicherung des Gebiets und möchte besonders auf das ganz neue und sehr hübsche Spiel mit dem Raunkreuzen hinweisen. Ich versuche dadurch, daß ich Anleitungen zur selbständigen Herstellung des Spielgeräts gebe, das Interesse des Lesers zu steigern...

In 1931, Kowalewski published a monograph entitled *Einführung in die Theorie der kontinuierlichen Gruppen*,⁵⁶ which summarized his optional lectures and seminars on Lie groups and groups of transformations that took place at the universities in Leipzig, Greifswald, Bonn and Prague.

⁵⁴B.G. Teubner, Leipzig, 1930, VI + 145 pages.

⁵⁵Dr. Martin Sändig oHG, Wiesbaden, 1968, VI + 145 pages.

⁵⁶Ausgabe Mathematik und ihre Anwendungen in Monographien und Lehrbüchern. Begründet von E. Hilb, herausgegeben von Prof. E. Artin, Hamburg, und Prof. G. Kowalewski, Dresden, Band 9, Akademische Verlagsgesellschaft M.B.H., Leipzig, 1931, 396 pages.

In the same year, Kowalewski published his book *Vorlesungen über Allgemeine natürliche Geometrie und Liesche Transformationsgruppen*,⁵⁷ which he dedicated to Georg Alexandr Pick, his Jewish friend, collaborator and colleague at the German University in Prague. On the first page of his book, Kowalewski wrote:

Georg Pick, dem Begründer der allgemeinen natürlichen Geometrie, dem Förderer der Lieschen Theorien in Forschung und Lehre, verehrungsvoll zugeeignet in dankbarem Rückblick auf die gemeinsame Tätigkeit an der deutschen Universität zu Prag.

Pick's important work on the natural geometry and the theory of groups and transformations, his impact on his doctoral students (E. Nothel and E. Stransky), his mathematical results in the natural and differential geometry, their applications as well as his generalization of Cesàro's results are strongly emphasized in Kowalewski's introduction and also in Kowalewski's list of references (see p. 276).

In 1932, Kowalewski published a monograph under the title *Interpolation und genäherte Quadratur. Eine Ergänzung zu den Lehrbüchern der Differential- und Integralrechnung*,⁵⁸ which was devoted to the problem of interpolation and quadrature approximation.

In 1933, Kowalewski published a short textbook entitled *Lehrbuch der höheren Mathematik für Universitäten und Technische Hochschulen*,^{A.23} which summarized his earlier mathematical textbooks. This three volume textbook contains more than 600 pages and covers linear algebra, analytic geometry, calculus, introduction to the theory of differential equations, elements of the differential geometry and the rudiments of the theory of complex functions and calculus of variations. Kowalewski's original intention of writing such a book is described in the book's introduction:

Als ich im Jahre 1928 mein 25 jähriges Professorenjubiläum beginn, legten mir einige meiner ehemaligen Schüler den Plan zu einem dreibändigen Lehrbuch der höheren Mathematik vor, das sich auf nachgeschriebene Kolleghefte stützen sollte.

Dieser Plan ist erst jetzt zu Ausführung gekommen. Ich machte bei der Sichtung des Materials die Beobachtung,

⁵⁷W. de Gruyter, Leipzig, 1931, 276 pages.

⁵⁸B.G. Teubner, Leipzig, 1932, V + 146 pages.

daß meine Hörer Fragen, die ich selbst für weniger wichtig hielt, oft mit großer Hingehung viel weiter verholt haben. Vielleicht wird gerade hierdurch die Lesbarkeit und Brauchbarkeit des Buches erhöht. Der Vortragende weiß oft nicht genau, nach welcher Richtung die Interessen der Höhere eingestellt sind. Manches hält er für besonders schön und interessant, was die jungen Köpfe geradezu abstößt. Es ist überhaupt kein schlechtes pädagogisches Prinzip, den Lernenden über die Lehrmethoden etwas mitreden zu lassen.

In 1937, Kowalewski published a small textbook *Magische Quadrate und magische Parkette*,⁵⁹ in which he explained in an accessible form the concepts of magic squares and magic parquet floors and how to create, describe, transform and classify them.

In 1938, Kowalewski published a small booklet *Der Keplersche Körper und andere Bauspiele*,⁶⁰ which is dedicated to Platon's solids and Kepler's polyhedrons, their designs and descriptions. It was inspired by Arnold Kowalewski, Gerhard Kowalewski's older brother.

In 1938, Kowalewski published the textbook *Grundbegriffe und Hauptsätze der höheren Mathematik insbesondere für Ingenieure und Naturforscher*,⁶¹ in which he profited from his experience of wide-ranging teaching at technical universities and explained how useful and important mathematics is for engineers and natural scientists, as we can read in his introduction:

Dieses kleine Buch will den jungen Ingenieuren und Naturforschern behilflich, die Grundbegriffe und Hauptsätze der höheren Mathematik klar zu erfassen. Es stützt sich auf eine fast 40-jährige Lehrerfahrung an Universitäten (Leipzig, Greifswald, Bonn, Prag) und Technischen Hochschulen (Prag, Dresden).

Angesichts der starken Zurückdrängung der Mathematik in den Lehrplänen unserer höheren Schulen ist es an den Hochschulen mehr denn je notwendig, mit allen Mittel vereinfachender Darstellungskunst dafür zu sorgen, daß wenigstens die Grundkenntnisse der höheren Mathematik fest angeeignet

⁵⁹K.F. Koehlers Antiquarium, Leipzig, 1937, 78 pages.

⁶⁰Ausgabe Scientia Delectans, Heft 3, K.F. Koehlers Antiquarium, Leipzig, 1938, 65 pages with 53 pictures.

⁶¹W. de Gruyter, Berlin, 1938, 156 pages, second edition, W. de Gruyter, Berlin, 1944, 156 pages.

werden, ohne die ein gedeihliches Studium der Technik und Naturwissenschaft undenkbar ist. Hierbei mitzuhelfen fühlte ich mich als alter Diener der mathematischen Lehre verpflichtet.

From the book *Grundbegriffe und Hauptsätze der höheren Mathematik insbesondere für Ingenieure und Naturforscher*, the students could learn more than the elements of linear algebra (vector spaces, theory of determinants and matrices) and calculus (sequences, series, limits, derivations, integrals). In Prague in January 1943, Kowalewski partly revised his textbook *Grundbegriffe und Hauptsätze . . .* and its new version was published in Berlin in 1944.⁶²

6. Kowalewski's fate after WWII. On May 7, 1945, Czech policemen arrested Gerhard Kowalewski considered to be an active fascist, because he was known as a German professor who remained in Prague and taught mathematics at German universities even during the days of the Prague May uprising. He was interrogated and held in prison for one year. Following the oral tradition,⁶³ he obtained expert opinions and positive evaluations and support of Russian, Jewish and French mathematicians.⁶⁴ Kowalewski was released. He was a member of the NSDAP and a member of the *Nationalsozialistischer Deutscher Dozentenbund* as many other German professors, docents and assistants, however, he was a passive member during his stay in Prague.⁶⁵ He has never been a member of the *Schutzstaffel* (SS) or the *Sturmabteilung* (SA).

In Prague, Kowalewski was not who he is usually considered by Czech mathematical community. He could not be a representative member of the NSDAP, because of his dubious personal life. At this time, it seems that he was not anymore fascinated by the fascist ideology, politics, anti-Jewish atmosphere and war effort. There is no evidence that he anyone ever harmed. Due to his age, he was not sent to the front and he was not involved in the military research.^{A.24}

During WWII, Kowalewski taught and worked in mathematics. From 1937 until 1941, he was a member of the editorial board of the discreditable known German journal *Deutsche Mathematik* which was founded

⁶²On the face page of the second edition of the book *Grundbegriffe und Hauptsätze* Kowalewski is introduced as an ordinary professor of mathematics at the German Technical University in Prague (Deutsche technische Hochschule in Prag).

⁶³The oral tradition was handed down for a long time among German mathematicians.

⁶⁴In the archives in Prague, no such letter of recommendation was discovered.

⁶⁵For more information, see [17].

by Ludwig Georg Elias Moses Bieberbach (1889–1982) and Karl Theodor Vahlen (1869–1945) in 1936 with the support of the German Research Foundation. Bieberbach was its chief editor and Vahlen was its publisher. The journal was declared the official organ of the German students' organisation *Deutsche Studentenschaft*. The main aim of the journal was to promote “German mathematics” and to eliminate “Jewish” influence and results (it can be compared with the nationalistic movement called the *Deutsche Physik* which was directed by Ph. Lenard).

In the journal *Deutsche Mathematik*, there were columns Work (*Arbeit*), Research (*Forschung*) and Pedagogy (*Belehrung*), where articles on mathematics (written for example by B. Bieberbach, L. Collatz, G. Kowalewski, P. Koebe, H. Kneser, H. Knothe, H. Solz, O. Teichmüller, E. Tornier, W. Weber), anti-Semitic and propagandistic articles, reviews of books and articles how to do “new mathematics” and how to teach “new National Socialist youth” were published. Many mathematical libraries outside Germany did not subscribe to the *Deutsche Mathematik* and many mathematical libraries in Germany destroyed its copies after WWII, so the journal is hardly available.⁶⁶

G. Kowalewski was one of the members of the editorial board for volumes 2–6 (the years 1937–1941). He published there only seven purely mathematical articles (1936 – 1 article, 1937 – 0, 1938 – 2 articles, 1939 – 1 article, 1940 – 2 articles, 1941 – 1 article, 1942 – 0) which contained neither anti-Semitic ideas nor any propaganda. From the preserved archival materials, it is not possible to determine why Kowalewski became a member of the editorial board of the journal *Deutsche Mathematik*. In [20], we can read: *Volume 1 [DM] also contains numerous other mathematical articles, many of them short and with reasonable mathematical content. Bieberbach clearly solicited articles from mathematicians he thought might contribute to launching his enterprise, and this probably account for the articles by Paul Koebe, Gerhard Kowalewski and Hellmuth Kneser.* ([20, p. 393]) But to publish some articles in such journal and to be an active member of the editorial board of such journal is not the same.

In 1946, Kowalewski – an admirer of German culture and history, who probably did not master Czech language and who had his family in Germany – contacted Czechoslovak authorities asking for Czechoslovak citizenship. We can only speculate why Kowalewski decided so. He was almost seventy years old and ill and he felt that he hardly has a perspec-

⁶⁶The volumes' tables of contents are available on the www page [https://commons.wikimedia.org/wiki/Category:Deutsche_Mathematik_\(journal\)](https://commons.wikimedia.org/wiki/Category:Deutsche_Mathematik_(journal)) [29.5.2018].

tive in the postwar Germany. He did not want to go to Germany, which was totally destroyed during WWII, he liked Prague and its “genius loci”, he had there some friends among Czech and German citizens, he thought that he could continue his life there without any obstacles and difficulties.

He did not obtain it because of his nationality, his age and the negative attitude of Czech professors from Charles University. During his first stay in Prague (from 1909 until 1920), Kowalewski had known several German and Czech mathematicians. He wrote about his contacts in these words:

Wir gewannen durch die Emausmönche, bei denen meine Frau zur Beichte ging, Beziehungen zu den tschechischen Kreisen. Die Mathematiker der beiden tschechischen Hochschulen waren sehr freundlich zu uns. An der tschechischen Universität wirkten Petr, Sobotka und Laska. Laska ist auch in Deutschland durch seine schöne Formelsammlung bekannt. Petr, ein äußerst scharfsinniger und auf absolute Strenge eingestellter Mathematiker, hat viele schöne Forschungsergebnisse aufzuweisen und wird als der tschechische Weierstraß bezeichnet. Er ist mir bis heute ein lieber, stets hilfsbereiter Freund geblieben. Auch mit Sobotka, einem bedeutenden und sehr produktiven Geometer, blieb ich bis zu seinem Tode in engster Verbindung. ([16, p. 229])

During WWII, there is no evidence that Kowalewski was in touch with Czech mathematicians. On June 6, 1946, a negative evaluation of Gerhard Kowalewski was given by the Czech mathematician Bohumil Bydžovský (1880–1969) at a professors’ meeting of the Faculty of Science of Charles University in Prague. Then, professors’ staff of the Faculty of Science of Charles University in Prague refused Kowalewski’s request to obtain Czechoslovak citizenship. In the document *Report of the professors’ meeting, June 6, 1946, Faculty of Science of Charles University*,⁶⁷ we can only read the short report: *Request of professor Kowalewski for Czechoslovak citizenship. Reporter professor Bydžovský. He explained that Kowalewski arrived to Prague after March 15, 1939 and he was German citizen. During all the war time he was not in touch with Czech mathematicians. After a short discussion it was unanimously approved not to recommend his request to obtain our state [Czechoslovak] citizenship.*

⁶⁷ *Zápis ze zasedání profesorského sboru Přírodovědecké fakulty Univerzity Karlovy v Praze ze dne 6. června 1946.*

As is known, after WWII the Beneš Decrees were issued, which regulated the status of citizens of German and Hungarian nationalities, collaborators of the Nazi occupants and proponents of the fascist ideology. After WWII, at Czech universities, there were people (as for example mathematicians Bohumil Bydžovský, Eduard Čech (1893–1960) and Josef Novák (1905–1999)) who had serious doubts about whether anyone of the German nationality is suitable for Czechoslovak citizenship and were openly against allowing German teachers to work at Czech schools.^{A.25}

Kowalewski could immigrate to Germany (to the American occupation zone), where his second wife and two children lived. On September 9, 1946, he finished his second sojourn in Prague; he moved to Bavaria and started his third and last career at the age of 70 years.⁶⁸ From 1946 until 1950, he lectured mathematics at the University in Regensburg (Faculty of Philosophy and Theology) and at the Technical University in Munich.⁶⁹ This was a very difficult time for him because he was seriously ill.

In 1950, Kowalewski's last book *Zur Analysis des Endlichen und Unendlichen. Vorlesungen aus Kurzsemestern von Dr. Gerhard Kowalewski vormals Professor der Mathematik an der Deutschen Universität und an der Deutschen Hochschule Prague*⁷⁰ was published. He finished his manuscript in Gräfelfing bei München in the year 1949. In his introduction, he wrote that he lectured the basic course on calculus in Regensburg at the so-called *Regensburger philosophische-teologische Hochschule*. It is improbable that he could use this entire text in his lectures because the book consists of three parts divided into 21 paragraphs, resp. 29, resp. 6 paragraphs. The first part is devoted to the so-called *Analysis des Endlichen* (that is, theory of determinants and matrices, systems of linear equations, vector analysis, volumes and applications of linear algebra). The second and third parts deal with the *Analysis des Unendlichen* (that is “classical” analysis or calculus).

Gerhard Hermann Waldemar Kowalewski died on February 21, 1950

⁶⁸For more information, see [4] and materials from Kowalewski's personal folders deposited in the National Archive of the Czech Republic (for example Kowalewski's personal folder nr. K4829/21, box nr. 5765, *Osobní složka, fond PŘ 1941–1951, Policejní ředitelství Praha II – všeobecná spisovna 1941–1950*, and the Prague police records – “register card Kowalewski G.”, *Osobní evidenční karty, fond PŘ – EO, Policejní ředitelství Praha II – evidence obyvatelstva*).

⁶⁹For more information, see [21] and http://de.wikipedia.org/wiki/Gerhard_Kowalewski [22.1.2018].

⁷⁰Verlag R. Oldenbourg, München, 1950, 274 pages.

in Gräfelfing bei München.

A. Endnotes

A.1. Pomerania is a region on the southern shore of the Baltic Sea; it was split between Germany and Poland. The region was greatly affected during the postwar period after the World War I and during the World War II. Alt Järshagen (now Stary Jarosław) is a small village in the West Pomeranian Voivodeship in north-western Poland.

A.2. Graudenz (now Grudziądz) is a city in the Kuyavian-Pomeranian Voivodeship in northern Poland. Loebau (or Löbau, now Lubawa) is a small city in the Warmian-Masurian Voivodeship in northern Poland.

A.3. Kaliningrad (Königsberg, Královec) is a seaport city and the administrative center of Kaliningrad Special Region, which is a Russian enclave between Poland and Lithuania on the Baltic Sea.

A.4. For more information about Kowalewski's arrival to Prague, see [4] and especially materials from Kowalewski's personal folder *Osobní složky profesorů techniky, fond MKV/R, 7 Prag – Profesoren*, box nr. 257, which is deposited in the National Archive of the Czech Republic.

A.5. For more information about Kowalewski's stay in Prague, see [4], where many materials from Kowalewski's personal folders deposited in the National Archive of the Czech Republic are quoted (for example Kowalewski's personal folder nr. K4829/21, box nr. 5765, *Osobní složka, fond PŘ 1941–1951, Policejní ředitelství Praha II – všeobecná spisovna 1941–1950*, Kowalewski's personal folder, box nr. 257, *Osobní složky profesorů univerzity, fond MKV/R, 5 Prag – Profesoren*, Kowalewski's personal folder, box nr. 114, *Osobní složky profesorů univerzity, fond MKV/R, 5 Prag – Philosophie – Profesoren*, and the Prague police records – „register card Kowalewski G.”, *Osobní evidenční karty, fond PŘ – EO, Policejní ředitelství Praha II – evidence obyvatelstva*).

Let us note that from 1882 till 1919 the university used the name *Německá Karlo-Ferdinandova univerzita v Praze*, from 1920 *Německá univerzita v Praze*, from 1939 *Německá Karlova univerzita v Praze*. In what follows, we will use the abbreviated form the German University.

A.6. The passport is deposited in Kowalewski's personal folder nr. K4829/21, box nr. 5765, *Osobní složka, fond PŘ 1941–1951, Policejní ředitelství Praha II – všeobecná spisovna 1941–1950*, Národní archiv České

republiky (National Archive of the Czech Republic).

A.7. Kowalewski's lectures and seminars at the German University in Prague from 1912 until 1920 are summarized in [4], where many information from *Ordnung der Vorlesungen an der k. k. Deutschen Karl-Ferdinands-Universität zu Prag im Winter-Semester 1912–13*, Prag, 1912, . . . , *Ordnung der Vorlesungen an der k. k. Deutschen Karl-Ferdinands-Universität zu Prag im Winter-Semester 1918/19*, Prag, 1918, and *Ordnung der Vorlesungen an der Deutschen Karl-Ferdinands-Universität zu Prag im Sommersemester 1919*, Prag, 1919, . . . , *Ordnung der Vorlesungen an der Deutschen Karl-Ferdinands-Universität zu Prag im Sommersemester 1919/20*, Prag, 1920, are quoted.

A.8. The copy of Kowalewski's nomination from July 25, 1912 is deposited in Kowalewski's personal folder, box nr. 114, *Osobní složky profesoru univerzity, fond MKV/R, 5 Prag – Philosophie – Professoren*, Národní archiv České republiky (National Archive of the Czech Republic).

A.9. For more information on the doctor degree procedures in mathematics at the German University in Prague, see [4], where materials from Protokoll über die Akte Erlangung der Doctorswürde an der philosophischen Facultät der Universität zu Prag, 24.3.1877 – 18.12.1913, and from Protokoll über die Akte Erlangung der Doctorswürde an der philosophischen Facultät der Universität zu Prag, 30.11.1912 – 5.12.1929, Archiv Univerzity Karlovy (Archive of Charles University), are quoted.

A.10. For more information, see [26] and the Mathematics Genealogy Project (<http://www.genealogy.ams.org> [27.4.2018]).

A.11. For more information, see [18] and [19]. For more information about the history of the Mathematische Kränzchen in Prag, see [3] and [4].

A.12. For more information, see for example [Be2] and especially the materials deposited in the folder *Sitzungsprotokoll in den Studienjahren 1882/ 1883, . . . , 1906/1907*, box nr. 13, the “funds” Filozofická fakulta Německé univerzity v Praze (Faculty of Arts of the German University in Prague), *Sitzungsprotokoll in den Studienjahren 1920/1921, . . . , 1937/1938*, boxes 1920–1932, 1932–1938, the “funds” Přírodovědecká fakulta Německé univerzity v Praze (Faculty of Science of the German University in Prague), the folder *Habilitationen 1939–1945*, box nr. 12, the “funds” Přírodovědecká fakulta Německé univerzity v Praze (Faculty of Science of the German University in Prague), Archiv Univerzity Karlovy (Archive of Charles University), where are

documents on the habilitation procedures.

A.13. See *Sitzungsprotokoll in den Studienjahren 1920/1921 and 1921/1922 of the Faculty of Science of the German University and diploma of Czechoslovak Ministry of Education (professors' meeting on January 19, 1922)*, box 1920–1932, the “funds” Přírodovědecká fakulta Německé univerzity v Praze (Faculty of Science of the German University in Prague), Archiv Univerzity Karlovy (Archive of Charles University), where there are deposited the protocols from professors' meetings (see especially professors' meetings on February 17 and July 7, 1921), which contains a brief report on Kowalewski's departure to Dresden. See also the copy of the letter of thanks written by the Dean.

A.14. See also G. Kowalewski: *Lobatschewskijs Herz, eine Rollkurve der nichteuklidischen Geometrie, Vorgelegt in der Sitzung am 8. März 1939*, zvláštní otisk z Věstníku Královské české společnosti nauk, Třída matematicko-přírodovědecká, Královská česká společnost nauk, Praha, 1939, 6 pages. Let us note that Kowalewski was not awarded the so called Lobachevskii Prize as it is sometimes wrongly written. In 1927, the prize was awarded to Hermann Weyl. For more information, see V.M. Bukhshtaber, S.P. Novikov: *History of the Lobachevskii Prize (on the centenary of the first awarding in 1897)*, Uspekhi matematicheskikh nauk 53 (1) (1998), pp. 235–238 (in Russian).

A.15. See for example M. Jašek: *Aus dem handschriftlichen Nachlass B. Bolzano's*, Věstník Královské české společnosti nauk, 1920–1921, nr. 1, pp. 1–32, M. Jašek: *Funkce Bolzanova*, Časopis pro pěstování matematiky a fysiky 51 (1922), pp. 69–76, M. Jašek: *Über den wissenschaftlichen Nachlass Bernard Bolzanos*, Jahresbericht der Deutschen Mathematiker-Vereinigung 31 (1922), 2nd part, pp. 109–110, M. Jašek: *O funkcích s nekonečným počtem oscilací v rukopisech Bernarda Bolzana*, Časopis pro pěstování matematiky a fysiky 53 (1923), pp. 102–109, K. Rychlík: *Über eine Funktion aus Bolzanos handschriftlichem Nachlasse*, Věstník Královské české společnosti nauk, 1921–1922, nr. 4, 6 pages, V. Jarník: *O funkci Bolzanově*, Časopis pro pěstování matematiky a fysiky 51 (1922), pp. 248–264. For relevant mathematical and historical commentaries, see [4], [5] and [16].

A.16. For more information, see [26] and the Mathematics Genealogy Project (<http://www.genealogy.ams.org> [27.2.2018]). However, there are wrong and incomplete as regards Kowalewski's doctoral students in Prague between 1912 and 1920. The information on Kowalewski's

doctoral students in Prague between 1939 and 1945 is totally missing.

A.17. For more information, see [16] and the www page http://tu-dresden.de/die.tu-dresden/verwaltung/dezernat_5/sachgebiet_5.7/Sonderausgaben/mathematiker.pdf [31.3.2018].

A.18. For more information, see Gerhard Kowalewski's *Ahnenpass* and personal questionnaires which are deposited in Kowalewski's personal folder nr. R31/582, the "funds" (or collection) *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen*, R31, Bundesarchiv, Berlin-Lichterfelde, Germany.

A.19. See also the same information published in [7] and the material available on the page http://tu-dresden.de/die.tu-dresden/verwaltung/dezenat_5/sachgebiet_5.7/Sonderausgaben/mathematiker.pdf.

A.20. See her requests, complaints and giving deposited in Kowalewski's personal folder nr. R31/582, the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen*, R31, Bundesarchiv, Berlin-Lichterfelde, Germany.

A.21. For more information on the complications of the civil processes, see the documents which are deposited in Kowalewski's personal folder nr. R31/582, the "funds" *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen*, R31, Bundesarchiv, Berlin-Lichterfelde, Germany.

A.22. First edition, Veit & Co., Leipzig, 1909, V + 550 pages, second edition, W. de Gruyter, Berlin, 1925, VI + 304 pages, third edition, W. de Gruyter, Berlin, 1942, VII + 324 pages, fourth edition, W. de Gruyter, Berlin, 1954, VI + 348 pages. Let us note that in 1945 a special copyright was given to USA; Kowalewski's book was published under the title *Einführung in die Determinantentheorie, einschließlich der Fredholmschen Determinanten*, Chelsea Publishing Company, New York, 1948, 320 pages. It was a reprint of the third German edition from 1942.

A.23. W. de Gruyter, Berlin, 1933, Band 1, *Vektorrechnung und analytische Geometrie*, 210 pages; Band 2, *Hauptpunkte der analytischen Geometrie des Raumes. Grundbegriffe der Differential- und Integralrechnung*, 240 pages; Band 3, *Fortsetzung der Differential- und In-*

tegralrechnung. Differentialgleichungen. Differentialgeometrie. Funktionen einer komplexen Veränderlichen. Probleme der Variationsrechnung, 252 pages.

A.24. According to https://de.wikipedia.org/wiki/Gerhard_Kowalewski, in 1941, Kowalewski was drafted by the High Command of the Navy (*Oberkommando der Marine*). He officially (but in reality only formally) worked as a mathematician for the Marine Weather Service in Greifswald (*Marinewetterdienst*). Then he worked as a mathematician for the Naval Observatory in Greifswald. But during that time, Kowalewski was ill and permanently lived in Prague. (For more information, see [4], the Prague police records – “register card Kowalewski G.”, *Osobní evidenční karty, fond PŘ – EO, Policejní ředitelství Praha II – evidence obyvatelstva* (National Archive of the Czech Republic) and the materials from Kowalewski’s personal folder nr. R31/582 deposited in the “funds” *Der Kurator der deutschen wissenschaftlichen Hochschulen in Prag und Kommissar der geschlossenen tschechischen Hochschulen, R31*, Bundesarchiv, Berlin-Lichterfelde, Germany.) In 1943, Kowalewski was declared unable to do military service by the Office of the German Armed Forces, although in this time, he was not ill and he lectured in Prague.

A.25. For example, we can read in the letter of October 23, 1973 written by Vladimír Kořínek (1899–1981), a professor of mathematics at Charles University, to Václav Havel, an associate professor of mathematics at Faculty of Science in Brno: ... *Naturally, after the war, in spite of being German, he [Jindřich Löwig] was not deported, stayed in Prague, but Prof. Bydžovský was definitely against any Germans getting positions at higher schools or universities, even if they were antifascist and democrats. I did not agree with Prof. Bydžovský about this. Rather it was my point of view that they ought to get some positions with us. (Lowig was not the only case.) Of course, there was nothing I could do about Bydžovský. That is why Lowig was forced long before February [communist coup in 1948] to leave Czechoslovakia and to look for a job abroad.* (Kořínek’s draft letter, the “funds” Vladimír Kořínek, box nr. 1, the folder of Václav Havel, Archiv Akademie věd České republiky (Archive of the Academy of Sciences of the Czech Republic).) For relevant information on the case of Jindřich Löwig, see M. Bečvářová et al.: *Forgotten Mathematician Henry Lowig* (1904–1995), edition History of Mathematics, volume 52, Matfyzpress, Praha, 2012.

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- [2] J. Bečvář: *Z historie lineární algebry [From the History of Linear Algebra]*, Edition *Dějiny matematiky*, volume 35, Matfyzpress, Praha, 2007 (Czech). Cited on p. [140](#).
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- [8] M. Hykšová: *Karel Rychlík (1885–1968)*, Edition *Dějiny matematiky*, volume 22, Prometheus, Praha, 2003 (Czech). Cited on p. [125](#).
- [9] G. Kirschmer: *Kowalewski, Gerhard*, in *Neue Deutsche Biographie*, Band 12, Duncker & Humblot, Berlin, 1980 (information on Kowalewski are available on the page 628). Cited on p. [130](#).
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Dwa praskie okresy w życiu Gerharda Hermanna Waldemara Kowalewskiego

Martina Bečvářová

Streszczenie. W oparciu o pogłębione i obszerne analizy różnych materiałów znajdujących się w archiwach Pragi: Uniwersytetu Karola, Politechniki, Narodowym, Akademii Nauk, Miejskim i Państwowym Archiwum Republiki Niemiec, prezentujemy ocenę działalności zawodowej i życia osobistego Gerharda Hermanna Waldemara Kowalewskiego (1876–1950), słynnego matematyka niemieckiego. Szczególną uwagę poświęcamy dwóm okresom 1909–1920 i 1939–1945, które nie zostały dostatecznie przedstawione i omówione w literaturze.

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Słowa kluczowe: Kształcenie matematyczne, kobiety w matematyce, przewody doktorskie z matematyki, Uniwersytet Karola w Pradze, Uniwersytet Niemiecki w Pradze, I połowa XX wieku.

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