Dr. Béla von Kerékjártó (1898 – 1946)

A Documentation of his Life and Work

compiled by Dr. Béla Kerékjártó (Jun.) in 1997

Contents

1. Origin of the family, name, parents

The **Kerékjártó** family can be traced back over a large number of generations. This family of landowners and Protestant ministers from the north-eastern extremity of the Great Hungarian Plain – not far from the Tisza river – received the patent of nobility from the Habsburgs in 1696, being granted the title of **Vetsei** after their name. Prior to this, their name had been written as **Kerékgyártó** (which means "wheelwright"), which is pronounced in precisely the same way as **Kerékjártó**.

When addressing the landed gentry in Hungary, the title was not added to their names in everyday usage. The correct rendering of the name in English would be **Kerékjártó de Vetse** (or, in German, **Kerékjártó von Vetse**). Presumably for the sake of simplification, either **de Kerékjártó** or **von Kerékjártó** was adopted for use in the western world outside of Hungary, following other examples.

Béla von Kerékjártó's father, Károly, was born on 13 February 1853 at the location of the family estate still. At the age of 41, when working as a civil servant in the capital of Budapest, he married 26-year-old Berta Holczer (on 22 October 1894), a commoner, thus forfeiting the right to the title of "Royal Chamberlain". A Puritan reformist, he had previously experienced the complete loss of the family estate and become an architect, taking up work as a civil servant in the Building Inspection Department of the Budapest city administration. The marriage produced two daughters (Gisela and Margit) and a son, Béla. In 1907, Károly died; his widow was to survive him by 52 years.

2. Curriculum vitae (summarised version)

On 1 October 1898, Béla István von Kerékjártó was born in Budapest as the second of three children. (On the original birth certificate, his name is written as Kerékgyártó and this was subsequently corrected to Kerékjártó in 1937). In the years that followed, the family moved into a detached house that they had bought in the northern suburb of Újpest ("New Pest", now part of Budapest). There he attended primary school and went on to grammar school. At the age of nine, he lost his father, who remained his role model – as a kind-hearted, fair person – for the rest of his life. The small family found itself confronted with economic hardship, which the young widow overcame with great aptitude. Son Béla, who constantly achieved good marks at school, testifying to his diligence (and exempting him from school fees) started giving private tuition early on, and later proceeded to give tennis lessons too. His gift for languages was also evident – he read the "Divina Commedia" in the original. The violin lessons that he was given to begin with were not really to his liking, and his musical talents only emerged when he switched to the piano. He developed his interest in mathematics about two years before taking his school-leaving examination, which he passed with top marks in 1916.

That same year, he registered at the Faculty of Philosophy of the University of Budapest, with the aim of studying mathematics. From May to November 1918, he worked (as an "observer") on the geophysical research initiated by Lorand v. Eötvös in Újvidék (now Novi Sad, Yugoslavia). Even before this, however, in mid-April, his first paper was accepted by Carathéodory for the "Mathematische Annalen" ("Über die Brouwerschen Fixpunktsätze" / "On the Brouwer Fixed Point Theorems"). In February 1920, he completed his studies, gaining his doctorate with first-class honours (*summa cum laude*).

He took up the post of an assistant at the University of Wales, which meant that, as of October 1920, he spent half a year with Grace and William Young in Lausanne. He completed the postdoctoral procedure for becoming a university

lecturer at the University of Szeged, with the oral examination being held on 12 December 1921 and his inaugural lecture on 15 December 1921.

In 1922, he was invited to Göttingen as a guest lecturer, where he held lectures during the summer semester and the following 1922-23 winter semester. In the summer semester of 1923, he was a guest lecturer in Barcelona. As of the winter semester, he spent nine months lecturing at Princeton University, returning to Europe in 1924. On 6 December 1924, he married Liselotte Kronbauer in Göttingen, whose parents ran a bookshop.

From February to May 1925 he was in Princeton again, holding lectures. Following this, in the summer semester, he was a guest lecturer at the University of Hamburg. In the autumn, he was appointed Associate Professor at the University of Szeged. And it was here, at the end of April 1926, that his daughter, Margit, was born.

In May 1929, Béla von Kerékjártó was invited to hold lectures at the Sorbonne. The six-week series of lectures was given in November and December of 1929. Shortly before this, in September 1929, his son Béla was born. This was also the year in which his Associate Professorship was turned into a Full Professorship. He was appointed Dean of the Faculty for the 1933/34 academic year. In 1934, he was elected a corresponding member of the Hungarian Academy of Sciences and, in spring 1935, he was offered an appointment at the University of Geneva. The Société Royale des Sciences de Liège elected him a corresponding member in 1937. And, at the end of that same year, he was offered a professorship at the University of Budapest. The factors in favour of his staying at Szeged were the better opportunities for work and the established prestige of the mathematical sector there. The factors against his remaining there were the particularly unhealthy climate, the limited choice of schools and the greater distance from the summer cottage that the family had just had built in the Mátra hills. His appointment as a professor in Budapest and the family's move took place in the summer of 1938.

In April 1940, the award of the Kornfeld Prize by the Hungarian Academy of Sciences constituted a friendly gesture amidst all the political disquiet, before, in the autumn of that year, the family suffered a decisive blow: their 14-year-old daughter contracted polio and very nearly died. The chances of her mobility being restored diminished from year to year, despite gargantuan efforts to provide everything conceivable for her rehabilitation, and this cast a shadow over Béla von Kerékjártó's final years. In 1944, he was granted full membership of the Academy.

In their summer cottage in the Mátra hills, the family was relatively safe from the bombing, but the front was getting nearer. Midway through November 1944, they left their cottage with just a few possessions and sought refuge in the months that followed in the nearby tuberculosis sanatorium. While their apartment in Budapest suffered severe damage from artillery fire and its contents were lost through looting, the family's summer cottage was rendered uninhabitable through plundering and wanton destruction. The family was able to return to Budapest by moving into an examination room in the main building of the Faculty of Philosophy. With just a few items of furniture from their previous apartment, they made a new life in makeshift accommodation.

Thanks to the initiative of biochemist Albert Szent-Györgyi, who founded an Academy of Natural Sciences (with the aim, in particular, of securing the survival of forty colleagues, including Béla von Kerékjártó, and von Békésy) the family were able to alleviate their direst need. During the immediate postwar period that was marked by a spirit of optimism, the politically untainted Béla von Kerékjártó was entrusted with a range of new functions. Lectures were held in lecture theatres with the windows missing, and the pressures of work and securing a livelihood became overwhelming. In November 1945, Béla von Kerékjártó was admitted to the sanatorium with a diagnosis of acute tuberculosis of the lung, where, six months later on 26 May 1946, he died of this same disease.

According to a list in the 1921 to 1970 Almanach of the University of Szeged (1971, pp. 173-174), Béla von Kerékjártó held memberships of the following: Matematikai és Fizikai Társaság (Hungarian Mathematical and Physical Society), Deutsche Mathematiker Vereinigung (German National Mathematical Society), the American Mathematical Society and the Société Mathématique de France (French Mathematical Society). In addition to the Academy memberships that have already been mentioned, from 1924 onwards, he belonged to the Geometry Committee of the National Academy of Sciences and also to the National Research Council in the USA.

In 1945, he took up the post of Chairman of the Franco-Hungarian Society.

3. Detailed chronology (1918 – 1944) of his scientific career

From entries made in his "Mathematical Notebook" (format 11x17cm), which he kept from 1919 onwards, it is possible, firstly, to see precisely where he spent different periods of time and, secondly, to gain insight into formulated problems, theorems, problem solutions, work schedules, publications and lectures. His notes are made in the language of his immediate environment at the time, with some of them even being multilingual.

His independent work starts at his home location of Újpest in 1918 [1,2]. The topic he covered for his doctoral thesis (which was entitled "On the periodic transformations and finite groups of the disk and the spherical surface" (in Hungarian) had already been published by the time he was awarded his doctorate [3]. Three further papers had been presented at meetings of the Academy [4,5,6].

Two weeks after the award ceremony for his doctorate, he travelled from Újpest to Vienna on 26 February 1920 before continuing to Berlin, on 2 March, where he stayed until 17 September. No detailed information has been handed down on his stay in Berlin, it can, however, be regarded as certain that he did not undertake

paid work there. The entries in his notebook are unusually numerous and versatile. He completed a publication [7] and a lecture for the natural scientists' meeting in Bad Nauheim – "On topological involutions and mapping" (in German: *Über topologische Involutionen und Abbildungen*) – which he delivered on 24 September 1920. On his way to Bad Nauheim, he spent a day in Göttingen (18 September). During the meeting, he made notes on the lectures given by Toeplitz, Koebe, Radon, E. Nöther and Pólya. Through Radon's lecture, he learned about Helly's theorem, which formed the subject of a short note [8].

He left Bad Nauheim on 30 September 1920 to start work with Professor Young in Lausanne on 1 October. During his stay there, which lasted until 20 March 1921, he was paid on the basis of an assistant's post at the University of Wales. In his notes, we find reference to his editing "Lectures on topology (Paras. 1-10) [Aberystwyth]" in January 1921 and "Lectures on algebraic functions" (Paras. 1-30) [Aberystwyth]" in February 1921. These lectures were evidently held by Young.

Leaving Lausanne, he returned to Újpest (21 March 1921), from where he worked on further publications [9. 10] and continued with his projects.

The qualification procedure for him to become a university lecturer took place from 8 to 12 December. His inaugural lecture was entitled "The topological fundaments of analysis and geometry" (in Hungarian). During that winter semester he lectured on "Elements of set theory and topology" and "Linear mapping" (in Hungarian). He held a lecture entitled "The continuous mapping of surfaces" (in Hungarian) on 9 March 1922 at the Hungarian Mathematical and Physical Society. He continued his work in Újpest [11, 12, 13], before leaving for Göttingen on 20 May 1922.

Arriving in Göttingen on 23 May, his first lecture as a guest lecturer was "On critical topology" (in German: *Über kritische Topologie*) and, for the winter semester, he announced he would be dealing with "Mathematical observations on cosmogony" (in German: *Mathematische Betrachtungen zur Kosmogonie*).

Alongside different notes [14, 16], he worked from the start of August (up until March 1923) on writing the book "*Vorlesungen über Topolgie I. Flächentopologie*" (Lectures on Topology I. Surface Topology) (Springer, Die Grundlehren der mathematischen Wissenschaften in Einzeldarstellungen, Band VIII. 1923). At the annual meeting of the Deutsche Mathematiker Vereinigung (German National Mathematical Society) from 17 to 24 September 1922 in Leipzig, he held a lecture entitled "*Hauptsatz der Flächentopologie bei unendlich hohem Zusammenhang*" (Fundamental theorem of surface topology with an infinitely high correlation).

His time in Göttingen came to an end on 28 March 1923, and he spent a number of weeks – from 31 March to 23 April) at home in Újpest [17], before embarking on his trip to Barcelona. First of all, however, he travelled to Göttingen from 25 April to 4 May 1923, where he became engaged to 17-year-old Liselotte Kronbauer on 28 April. After a brief stopover in Frankfurt am Main from 4 to 5 May, he arrived in Barcelona on 8 May, where he stayed until 5 September. In May and June, he held "10 Conférences sur la géometrie et sur la théorie des fonctions" at the Institud d'Estudis Catalans. He contributed "Funcion" to the Enciclopedia Espasa, Barcelona, and "Théorie des ensembles, Topologie, Théorie des fonctions" for Sciencias contemporanes. His next major destination was Princeton University in New Jersey. Since he took the ship from Hamburg on 10 October, he was able to spend from 8 September to 4 October in Göttingen, before embarking for Hamburg.

On 22 October 1923, he arrived in Princeton, remaining there as a lecturer until 2 July 1924. In his notes, he arranged his "Lectures on topology" into Topology II with the n-dimensional spaces and abstract sets. He also held a number of lectures in the Mathematical Club of Princeton: Surfaces in the space R_3 (November 1923), Continuous curves and open surfaces (February 1924) and, finally, the Intuitionistical theory of sets (April 1924). During this time, he also submitted three notes to the Academy [18, 19, 20]. On 2 July, he travelled to New York, where, three days later, he boarded a ship for France. From 14 to 20 July,

he was in Paris and then, up until 5 August, in Göttingen. After visiting relatives in Bensheim/Germany with his fiancée, he went home on 18 August, only to return to Göttingen again four weeks later, where the wedding was held on 6 December. After the honeymoon (in the Harz mountains of Germany), followed by Christmas and New Year celebrations in Göttingen, Béla von Kerékjártó travelled to the USA again, via Hamburg, on 8 January. His arrival in Princeton on 21.1.1925, marked the start of a stay that lasted until 18 May. As of February, he held "Lectures on continuous groups" at the university, and, in lectures held at the Mathematical Club of Princeton, he dealt with "Convex regions" (March), "Topology of spaces" (1 April) and "Abstract sets and continuous groups" (22 April). He prepared five notes during this time [21, 22, 22a, 23, 24]. Apart from Princeton, he was also frequently in New York (2 and 23 February, 6 April, and 19 to 20 May), and during one of his trips (6 to 16 April), he visited Buffalo and, at somewhat greater length, Chicago, Washington and Baltimore.

Upon his return to Europe, he first went to Copenhagen (30 May – 2 June) where he held a lecture at the Copenhagen Mathematical Society "On Families of Surfaces and Curves" (2 June). Following this, he was a guest lecturer at the University of Hamburg where, in the summer semester of 1925, he held lectures on continuous groups. To the series of treatises of the Department of Mathematics at the University of Hamburg, he contributed the German version [18a] of his paper "Über stetige Kurven" (On continuous curves) [18]. Apart from a short break for a trip to Budapest (3 to 6 July), he remained in Hamburg up until 1 October. Then, after a farewell week in Göttingen (1 to 8 October), the young couple embarked on a lengthy journey, which ended in Újpest on 20 November. Prior to this, they had spent a week in Strasbourg (8 to 15 October), a number of days in Lucerne and Milan (15 to 18 October) and then a whole month in Venice (19 October to 19 November).

Béla von Kerékjártó's appointment as an Associate Professor at the "Royal Hungarian Franz Joseph University" in Szeged took effect on 30 November 1925. At the start of the semester, at the beginning of February 1926, he had already set

up home with his wife in Szeged. The lectures he was required to hold, together with practical exercises, related primarily to analytical and descriptive geometry. This was followed, in the second year, by projective geometry and differential geometry. For advanced students, the following lectures were held on an alternating basis: geometric group theory, the concept of area and volume, algebraic geometry, the theory of linear mapping, geometric function theory, non-Euclidean geometry and higher projective geometry.

Since the university had only been located in Szeged for a few years, having moved there from Kolozsvár (Romanian: Cluj), which fell to Romania under the terms of the Trianon Peace Treaty, space was very limited and the staff situation difficult. Through ongoing financial support from the Minister of Education (Count Kuno von Klebelsberg) and also funds from abroad (particularly from the Rockefeller Foundation), however, the university's situation gradually stabilized. The relatively young teaching staff prompted an upswing in a large number of sectors and ensured that the university attracted attention internationally.

After the prevailing difficulties had been overcome, it is clear from the publications from 1927 onwards already [25, 26, 26a, 27, 28], that Béla von Kerékjártó was continuing to work on his earlier projects. Together with his wife and parents-in-law, he spent the summer of 1927 in the resort of Bruckmühl in Bavaria/Germany (6 July to 18 August), while the summer of 1928 was spent in Újpest (15 June to 10 August). In the autumn of 1928, he took part in the International Mathematicians' Congress in Bologna [32]. He also visited Florence (2 to 10 September). A further three notes [29, 30, 31] date from this year. In May 1929, he received an invitation to hold a series of lectures at the Sorbonne (University of Paris). These were held from 7 November to 19 December under the title "Leçons sur la Topologie et la Théorie des groupes continus". The contents included: "Quelques problèmes de la Topologie générale; Topologie des surfaces. Applications à la géometrie".

The statement printed in an obituary (Acta Sci. Math. 9 [1948]) maintaining that "A l'invitation de la Sorbonne, il revient des États-Unis à Paris. Par ses 'Leçons sur la topologie et ses applications', il s'acquiert le respect des géometres français les plus distingués." (*At the invitation of the Sorbonne, he returned from the USA to Paris. Through his 'Lessons on topology and its applications' he gained the respect of the most distinguished French geometrists)* is probably based on an inaccuracy, with his Paris stay of 1924 and the lectures of 1929 being taken together. There are no references in his notes to lectures during his one-week stay in Paris in July 1924.

Even before he gave his lectures in Paris, he had already paid visits to Göttingen and Hamburg in the summer of 1929 (15 to 23 July). There are no notes on the purpose of this visit. Although his next note [33] was published in Hamburg, the contents are essentially based on the lectures held in Hamburg in 1925.

In the agricultural country of Hungary, the years 1930/31 were marked by the devastating effects of the world economic crisis. The City of Szeged's coffers were also empty, and dissatisfaction and political extremism started to manifest themselves. There are not so many publications dating from this period [33-36], but Béla von Kerékjártó's participation in the congress in Zurich from 4 to 11 November 1932 seems to have provided him with considerable stimulus.

He was elected Dean of the Faculty of Mathematics and Natural Sciences for the 1933/34 academic year and, in this function, he was also called upon to have a restraining influence on demonstrating students. Despite the additional burdens it brought, 1934 was one of Béla von Kerékjártó's most fruitful years [37-46]. He held an imposing inaugural lecture before the Hungarian Academy on 8 October 1934 [44], after having presented a report to the Hungarian Mathematical and Physical Society on 25 January of that same year – "On topological problems of function theory" (in Hungarian) – as well as a six-part series of lectures in June and July at a continuing-education course for grammar school teachers "On the structure of geometry" (in Hungarian, Litogr., Jan. 1935). Finally, before Christmas, he also

completed the article on "Topology" for the Encyclopédie Française I (1937). At the ceremony at the end of the university academic year in the summer, it was the Dean of the Faculty of Natural Sciences who delivered the address this time round: "The law of nature and mathematics" (in Hungarian, University Almanach 1934, Szeged). The audience included the local dignitaries from the City of Szeged and the bourgeoisie who, rather abruptly, had to realise that mathematics now formed part of the development of civilisation too.

1935 was a year marked by decisions that brought signs of encouragement in respect of positive future developments.

After the family had spent the summers of 1932 to 1934 in the Bükk hills, they became acquainted with the small resort of Mátrafüred in the Mátra mountains – first of all in winter and then in the summer too. And it was here that they were to build a holiday cottage of their own. The academic year with all the duties of the Vice-Dean came to an end and, in addition to a number of notes [47-49], Béla von Kerékjártó prepared his lecture for the International Topology Congress in Geneva in October [50]. He spent the few days before and after the congress (18 to 20 October and 28 to 30 October) in Lausanne and Zurich. In the meantime, he was making plans for a multi-volume monograph on the fundamentals of geometry. The first part: "The elementary structure of Euclidean geometry" was compiled in 1936, and published by Béla von Kerékjártó himself midway through 1937, with support from the Academy (Original Hungarian title: *A geometria alapjairól I. Az euklidesi geometria elemi felépitése*, Szeged, 1937). In the preface, he specified the aim that grammar-school teachers should get to know the geometrical theorems used in tuition within the scientific system of geometry. This was reminiscent of the aim of the project that had previously been implemented by Felix Klein [F. Klein, Gesammelte mathematische Abhandlungen, (*Collected Mathematical Treatises*) Berlin 1923].

In Summer 1936 (11 to 21 July), the well-organised congress in Oslo was held, with Béla von Kerékjártó making two contributions of his own [52, 53]. Shortly

before, he had had the opportunity to foster contacts with members of the "Comité de Coopération Intellectuelle" (affiliated to the League of Nations), which was meeting in Budapest. On this occasion, P. Valéry asked him to hold a lecture at the Descartes congress in Paris the following year. The lecture, which was dedicated to Valéry [54], was held at the start of August (between 1 and 8 August) 1937. From April onwards, he undertook a lengthy round trip around Western Europe with his wife for the first time (18 April to 20 May 1937), travelling via Göttingen to Brussels (Carathéodory), including a trip to Liège (Soc. Royale des Sciences), before continuing to Paris (Cartan) and Strasbourg and finally visiting Lausanne and Geneva (R. Wavre and G. De Rham). He paid a second visit to Paris (on official business) from 4 to 12 July. In the autumn, he went to Warsaw (28 September to 4 October) and deepened his friendship with Sierpiński, in particular.

In 1938, he took the decision to accept the offer of the Chair of Higher Geometry at the University of Budapest. His summer break in the family's own holiday cottage was interrupted by an official trip to Geneva (10 to 22 July). From September onwards, he was with the family in Budapest, apart from a short stay in Zurich in late autumn (6 to 9 December). He experienced the restrictions of getting used to his new living and working conditions, which cost him time and energy. A lecture presented to the Eötvös Society [55] was published in 1939. As in the year before, he went on an official trip to Geneva in July (14 to 23 July). The outbreak of war, even though not unexpected, brought decisive changes. Some of the numerous publications [56-68] which he prepared in 1940 were dedicated to colleagues (Cartan, Brouwer), who were already feeling the effects of the war in their home countries. He received a great honour with the award of the Kornfeld Prize by the Hungarian Academy. Paul Valéry, who was made an honourable member of the Hungarian Academy, invited him to Nice to a conference at the Centre Universitaire Méditerranéen on the topic "La vérité sur les rapports profonds de la musique avec les mathématiques" (*The truth on the deep relationship between music and mathematics)*. The war prevented this from taking place. The family spent their last summer holiday together as an intact family unit

before their daughter's illness in the autumn of 1940 changed their outlook for the future. In spring (3 April) 1941, with the dramatic death of Count Teleki, Béla von Kerékjártó lost a friend with whom he had worked together and enjoyed a close and trusting relationship. The subsequent change of political course and the country's entry into the war cast gloomy shadows: countless individuals who feared they would suffer persecution (on the basis of race) left the country – at the last possible point in time.
Despite this, Béla von Kerékjártó continued to work highly intensively. In addition to a number of notes [69-73], which were completed by 1943, the main focus of his work was on the second part of the "Fundamentals of Geometry", entitled "Projective Geometry". The manuscript was drawn up in French and Hungarian simultaneously. In the winter of 1942 (24 January to 27 February) he was in the freezing and starving Eternal City to give lectures – holding them in Italian, by way of understandable consideration. His participation in an international mathematicians' congress in Rome that same year [72], brought him together with colleagues from Sweden, Spain and Switzerland.

During 1942 and 1943, while the Hungarian army and conscripted labourers were losing their lives on the eastern front, Budapest was still relatively peaceful and quite attractive for visitors from the Third Reich. Since Béla von Kerékjártó had received disconcerting news about Brouwer, he attempted to obtain a limited residence permit for Brouwer in Hungary, via the Hungarian Academy. The German officials in charge brusquely rejected this wish, pointing out that there were German scientists who had to be considered first. The Academy thus invited Max Planck, who then actually came, accompanied by Werner Heisenberg. The book on "Projective Geometry" which was completed in 1944 was destroyed in a bombing raid while it was still in the printing works, just before it was sent out. Only a few copies that had been sent out in advance survived the war, rendering the book virtually inexistent. The French version was similarly lost through acts of war, which meant that the subsequent French edition (Les fondements de la géométrie II. Géométrie projective, Budapest 1966) was a new translation, in the same way

as the first volume had been (Les fondements de la géométrie I. La construction élémentaire de la géométrie euclidienne, Budapest 1955).

Béla von Kerékjártó was granted membership of the Hungarian Academy on 30 May 1944, at the same time as Zoltán Kodály and Béla Bartók. No inaugural lecture was held on account of the war.

3a. Publications in periodicals, referenced in Chapter 3

No.	Work completed	Title, published in
		In the case of Academy Notes, the person communicating the note is included in brackets In the case of titles, the original language is included first, followed by German then English translations in brackets, as appropriate.
1	December 1918	Über die Brouwerschen Fixpunktsätze (*On the Brouwer fixed point theorems)* Mathem. Annalen 80 (1919) 29-32
2	December 1918	Über Transformationen des ebenen Kreisringes (*On transformations of the planar annulus*) Mathem. Annalen 80 (1919) 33-35
3	February 1919	Über die periodischen Transformationen der Kreisscheibe und der Kugelfläche (*On the periodic transformations of the circular disk and the spherical surface*) Mathem. Annalen 80 (1919) 36-38
4	October 1919	Jordan görbetételének bebizonyitása (Der Beweis des Jordanschen Kurvensatzes) (*The proof of Jordan's curve theorem*) M. Tud.Akad., 20 Oct. 1919 (Kürschák), Mat.Term. tud Ért. 38 (1921) 194-198
5	October 1919	Über die Transformationen ebener Bereiche. (*On the transformations of planar domains*) Amsterdam Academy, 25 October 1919 (Brouwer) Amst. Ber. 28 (1920) 379
6	October 1919	Über die endlichen topologischen Gruppen der Kugelfläche. (*On the finite topical groups of the spherical surface*) Amsterdam Academy, 29 November 1919. (Brouwer) Amst. Ber. 28 (1920) 555-556
7	April 1920	Zur Theorie der mehrdeutigen stetigen Abbildungen. (*On the theory of continuous many-valued mapping*) Math. Zeitschr. 8 (1920) 310-319

8	April 1921	A Helly-féle tételről (Über den Satz von Helly) (*On Helly's theorem*) M.Tud.Akad. 23 May 1921 (Rados), Mat.Ter.tud. Ért. 38 (1921) 415-416
9	October 1921	A tartomány-jelleg megmaradásáról (Über den Erhalt der Bereichseigenschaft) (*On the conservation of the domain property*) M.Tud.Akad. 24 October 1921 (Kürschák), Mat.Term.tud.Ért. 39 (1922) 220-221
10	November 1921	A torus periodikus transformatioiról (Über periodische Transformationen des Torus) (*On periodic transformations of the torus*) M. Tud. Akad. 21 November 1921 (Rados), Mat.Term.tud.Ért. 39 (1922) 213-219
11	March 1922	Az analysis és a geometria topologiai alapjairól. (Über die topologischen Grundlagen der Analysis und der Geometrie) (*On the topological foundations of analysis and geometry)* Acta litt.ac scient. Szeged 1 (1922) 46-52
12	April 1922	Folytonos leképezésekről (Über stetige Abbildungen) (*On continuous mapping*) Mat.Fiz.Lapok 29 (1922) 44-48
13	April 1922	Görbék és görbeseregek topologiájáról Über die Topologie von Kurven und Kurvenscharen (*On the topology of curves and families of curves*) M.Tud.Akad. 22 May 1922 (Kürschák), Mat.Term.tud.Ért. 39 (1922) 305-313
14	June 1922	Kurvenscharen auf Flächen. (*Families of curves on surfaces*) Göttinger Akademie, 14 July 1922 (Runge) Gött.Nachr. (1922) 71-79
15	October 1922	Hauptsatz der Flächentopologie bei unendlich hohem Zusammenhang. (*Fundamental theorem of surface topology with an infinitely high correlation)* Jahresbuch Deutsch.Math.Ver. 31 (1923) 98-99

16	November 1922	Note on continuous transformations. London Math. Soc. 9 November 1922. (Hardy) Proc. London Math.Soc.22 (1923) 270-274
17	April 1923	A gömb leképzéseinek véges csoportjairól. (Über die endlichen Gruppen der Abbildungen der Kugel) (*On the finite groups of sphere mapping*) M.Tud.Akad. 9 April 1923 (Kürschák) Mat.Term. tud.Ért 40 (1923) 179-182
18	February 1924	Folytonos görbékről *(*Über stetige Kurven*)* (*On continuous curves*) M.Tud.Akad. 19 May 1924 (Kürschák), Mat.Term.tud.Ért 41 (1924) 230-240
19	February 1924	On the variation of arcus on a simple closed curve. London Math.Soc. April 1924 (Watson) Proc. London Math. Soc. /2/ 23 (1924) 39-40
20	April 1924	On parametric representation of continuous surfaces. Nat.Acad. 23 April 1924 (Veblen) Proc.Nat.Acad.Sci.Washington 10 (1924) 267-271
21	March 1925	Remarques sur des propriétés topologiques. (*Comments on topological properties*) Acta lit.ac scient. 2 (1925) 157-161
22	March 1925	Folytonos csoportok geometriai elméletéről. I. A sík egytagú csoportjaina pályavonalairól. [See 22a.] M.Tud.Akad. 8 June 1925 (Kürschák) Mat.Term.tud.Ért. 42 (1925) 240-253.
23	March 1925	Sur les familles de surfaces et de courbes. Acad. Paris 11 May 1925 (Hadamard) C.R. Acad.Sci.Paris 180 (1925) 1565-1567
24	March 1925	Sur les familles de surfaces et de courbes. I. Conditions de régularité pour les familles de surfaces. Acta lit. ac. sci. 2 (1925) 162-166
22a	May 1925	On a geometrical theory of continuous groups. Families of path-curves of continuous one-parameter groups of the plane. Annals of Math. 22 (1925), 105-117

18a	June 1925	Über stetige Kurven. (*On continuous curves*) Abhandlung (*Treatise)* Math. Sem. Hamburg, 4 (1925) 164-171
25	December 1926	Involutions et surfaces continues I. Acta lit. ac sci. 3 (1927) 49-67
26	June 1927	Groups II. Euclidean and hyperbolic groups of the three-dimensional space. Annals of Math. 29 (1928) 169-179.
26a	October 1927	Folytonos csoportok II: A háromdimenziós tér euklidesi és hyperbolikus csoportjairól (*Groups II. Euclidean and hyperbolic groups of the three-dimensional space*) [see 26] M. Tud. Akad. 7 November 1927 (Kürschák) Mat.Term.tud.Ert.45 (1928) 290-305
27	October 1927	Involutions et surfaces continues II. Acta lit. ac. sci. 3 (1927) 242-249
28	November 1927	Folytonos csoportok III. A háromdinenziós geometriák megalapozása a Helmholtz-féle monodromia-axiomával (Geometrische Theorie der stetigen Gruppen III. Das Monodromie-Axion von Helmholtz als Grundlage für dreidimensionale Geometrie) (*Groups III: The mondrom axiom of Helmholtz as a basis for three-dimensional geometry)* Mat.Term.tud.Ért. 45 (1928) 306-315
29	April 1928	Démonstration élémentaire du théorème de translation du à M. Brouwer. Acad.Paris, 14 May 1928 (Hadamard), C.R.Acad.Sci.Paris 186, 1699
30	April 1928	Démonstration élémentaire du dernier théorème de Poincaré, Acad.Paris, 21 May 1928 (Hadamard). C.R. Acad.Sci.Paris 187 20-22
31	June 1928	The plane translation theorem of Brouwer and the last geometric theorem of Poincaré. Acta lit. ac sci. 4 (1928) 86-102
32	November 1928	Note on the general translation theorem of Brouwer. Atti del Congr.Int.Mat.Bologna 4 (1928) 235-238

33	April 1930	Geometrische Theorie der zweigliedrigen kontinuierlichen Gruppen. (*Geometric theory of the two-parameter continuous groups*) Abhandlung (*Treatise*) Math.Sem.Hamburg 8 (1930) 107-114
34	May 1930	Démonstration élémentaire du théorème de Jordan sur les courbes planes. Acta lit. ac sci. 5, (1930) 56-59
35	May 1931	Sur l'existence de racines carrées dans les groupes continues. Acad.Paris 1931 (Cartan) C.R. Acad.Sci. Paris, 193 (1931) 1384-85
36	November 1931	A nyilt felületek topologiájáról. (Über die Topologie offener Flächen) (*On the topology of open surfaces)* Mat.Fiz.Lapok Festheft Rados, 38 (1931) 146-155
37	December 1933	Über die fixpunktfreien Abbildungen der Ebene (*On the fixed-point-free mapping of the plane)* Acta lit. ac sci. 6 (1934) 226-234
38	January 1934	Sur le caractère topologique des representations conformes. Acad. Paris 15 January 1934 (Cartan) C.R.Acad.Sci. Paris 198 (1934) 317-320
39	January 1934	Topologische Charakterisierung der linearen Abbildungen. (*Topological characterisation of linear mapping)* Acta lit.ac sci. 6 (1934) 235-262 Ergänzung (*Addendum*): ibid 7 (1934) 58-59
40	February 1934	Sur les similitudes de l'espace. Acad.Paris, 9 April 1934 (Cartan) C.R.Acad.Sci.Paris 198 (1934) 1345-47
41	March 1934	Sur la régularité des transformations d'un groupe continu simplement transitif. Acad.Paris, 19 March 1934 (Cartan) C.R.Acad.Sci. Paris 198 (1934) 1114-1116
42	April 1934	Sur le groupe des transformations topologiques du plan. Annali d.R.Scuola Norm.Sup.Pisa (2) 3 (1934) 393-400

43	June 1934	Über reguläre Abbildungen von Flächen auf sich. (*On regular mapping of surfaces on themselves*) Acta lit. ac sci. 7 (1934) 65-75
44	September 1934	Über die regulären Abbildungen des Torus. (*On regular mapping of the torus*) Acta lit.ac sci. 7 (1934) 76-84
45	October 1934	Die Theorie der regulären Abbildungen von Flächen. (*The theory of the regular mapping of surfaces)* M.Tud.Akad. 8 October 1934. Inaugural lecture, Mat.Term.tud.Ért. 53 (1935) 371-406
46	October 1934	Démonstration nouvelle d'un théorème de Klein et Poincaré. Acta lit.ac 7 (1935) 160-162
47	February 1935	Sur l'indice des transformations analytiques. Acta lit. ac sci. 7 (1935) 163-172
47a	February 1935	Analytikus leképezések indexéről, [see 47] (*On the index of analytical transformations*) M.Tud.Akad. 18 February 1935, Mat.Term.tud.Ért. 53 (1935) 407-419
48	June 1935	Stabilité permanente et l'hypothèse ergodique. Acad.Paris 9 June 1935 (Cartan), C.R.Acad.Sci. Paris 201 (1935) 123-124
49	June 1935	Bemerkung über reguläre Flächenbildungen (*Comment on regular surface transformations)* Acta lit.ac sci. 7 (1935) 206
50	October 1935	Sur la structure des transformations topologiques des surfaces en elles-mêmes. Einseignement Math. 35 (1936) 297-316
51	May 1936	A hyperbolikus sikgeometria felépitése I. (Der Aufbau der hyperbolischen Geometrie der Ebene) (*The structure of the hyperbolic geometry of the plane)* M.Tud.Akad. 11 May 1936. Mat.Term.tud.Ért. 59 (1940) 19-37
52	July 1936	Topologie des transformations. Congrès Internat.Mathém. Oslo 1936

53	July 1936	Sur la géométrie hyperbolique. Congrès Internat.Mathém. Oslo 1936
54	August 1937	La méthode de Descartes et la géometrie moderne. Traveaux du IX^{e} congrès international de philosophie (Congrès Descartes) 6 (1937) 166-173
55	June 1939	Topologikus leképezések és folytonos csoportok. (Transformations topologiques et groups continues) (*Topological mapping and continuous groups*) Mat.Fiz. Lapok 46 (1939) 1-12
56	February 1940	A hyperbolikus sikgeometria felépitése II. (Sur la géométrie hyperbolique plane) (*On flat hyperbolic geometry*) M.Tud.Akad. 19 February 1940. Mat.Term.tud.Ért. 59 (1940) 38-61.
57	February 1940	A körgeometria megalapozása (Grundlagen der Kreisgeometrie) (*The fundaments of the geometry of the circle*) Mat.Fiz.Lapok 47 (1940) (Cartan) C.R.Acad.Sci.Paris 210 288-289
58	February 1940	Sur les inversions dans un groupe commutatif. Acad.Paris 19 February 1940 (Cartan) C.R. Acad.Sci.Paris 210 288-289
59	April 1940	Sur le caractère topologique du groupe homographique de la sphere. Acta Math. 74 (1941) 311-341. See also: J.Math.Pures Appl. 21 (1942) 67-100
60	May 1940	A gömb lineáris csoportjának topologiai jellemzése (Sur le caractère topologique du groupe homographique de la sphere) M.Tud.Akad. 20 May 1940. Mat.Term.tud.Ért. 59 (1940) 420-440
61	May 1940	A complex projektiv geometria topologiai alapjairól. (Sur les fondements topologiques de la géometrie projective complexe) M.Tud.Akad. 20 May 1940. Mat.Term.tud.Ért. 59 (1940) 442-453

62	June 1940	Nouvelle méthode d'édifier la géométrie plane de Bolyai et Lobatchefski. Comment.Math.Helv. 13 (1940) 11-48
63	June 1940	Sur les groupes transitifs de la droite. (*On the transitive groups of the straight line*) Acta Sci.Math. Szeged 10 (1941) 21-35
64	June 1940	Az egyenes transitive csoportjairól, [see 63] (*On the transitive groups of the straight line*) M.Tud.Akad. 24 June 1940. Mat.Term.tud.Ért. 59 (1940) 455-474
65	June 1940	Sur le groupe des homographies et des antihomographies d'une variable complexe. Comment.Math.Helv.13 (1940) 68-82
66	August 1940	A projektiv sik periodikus leképezéseiről. (Über periodische Abbildungen der projektiven Ebene) (*On periodic transformations of the projective plane*) M.Tud.Akad. 21 October 1940, Mat.Term.tud.Ért. 59 (1940) 798-803
67	October 1940	A gömbfelület topologikus leképezéseinek kompakt csoportjairól (Über kompakte Gruppen der topologischen Abbildungen von Kugelflächen) (*On compact groups of the topological mapping of spherical surfaces)* M.Tud.Akad. 21 October 1940. Mat.Term.tud.Ért. 59 (1940) 805-827
68	December 1940	Felületek kompakt csoportjainak meghatározása (Bestimmung der kompakten Gruppen von Flächen) (*Determination of the compact groups of surfaces)* M.Tud.Akad. 9 December 1940. Mat.Term.tud.Ért. 60 (1941) 9-32
69	March 1941	Sur les groupes compacts de transformations topologiques des surfaces. Acta Math. 74 (1941) 129-173
70	May 1941	A harmadrendü integrálháto csoportokról *(On three-parameter integrable groups*) [see 71] M.Tud.Akad. 19 May 1941. Mat.Term.tud.Ért. 60 (1942) 683-692

71	June 1941	Über die dreigliedrigen integrierbaren Gruppen *(On three-parameter integrable groups*) Math.Annalen 118 (1942) 365-378
72	March 1943	Topologia dei gruppi di transformazioni delle superficie. (*Topology of the transformation groups of surfaces*) Atti convegno mat. Roma 1942 (1945) 35-47
73	March 1943	Vizsgálatok a felületek topologiai leképzéseinek szerkezetéről I-II (Untersuchungen über die Struktur der topologischen Abbildungen von Flächen I-II) (*Investigations into the structure of the topological mapping of surfaces I-II)* M.Tud.Akad. 22 March 1943. Mat.Term.tud.Ért. 63 (1943)

4. Additional biographical details

University of Szeged: His receptiveness to neighbouring subject areas was evident from the lectures he held on classical mechanics and celestial mechanics over entire semesters, standing in for other lecturers. He also willingly gave a course on ballistic geometry in the form of a colloquium when young artillery officers requested him to do so, in order to provide them with further training.

Editorial work: After Alfred Haar, one of the editors of the Acta Litterarum ac Scientiarum died at an early age in 1933, Béla von Kerékjártó took over his work and, together with F. Riesz, he edited the journal up until his death.

Book reviews: Between 1926 and 1939, he reviewed 34 foreign mathematical monographs (in German, French and English) in the Acta Litterarum ac Scientiarum.

Franco-Hungarian Society: He was president of this society, which was founded in 1945, up until his death. In a well-documented article, he wrote in the "Budapest" journal (No. 2 of November 1945) about Paul Valéry's visit to Budapest in 1936. At the same time, this also marks a tribute to a very special friendship.

Deputising for Teleki on the Comité de Coopération Intellectuelle: By virtue of Béla von Kerékjártó's pre-existing contact with P. Valéry (dating from 1929), his perfect command of the French language, his skill in discussions and also because of Teleki's personal trust in him, Béla von Kerékjártó took over his function in the Comité during Teleki's period in office as Minister of Education and Prime Minister. In this circle, he made the acquaintance of a number of the big names on the European intellectual scene (Duhamel, Huizinga, Madariaga and Piaget, etc.). The prime aim pursued was to improve the cultural and educational situation of the Hungarian sections of the population in the Little Entente countries (Czechoslovakia, Romania and Yugoslavia).

Languages and music: His talent for foreign languages benefited from his rapid learning and his great capacity for memorising vocabulary and grammar. He had a perfect mastery of French and also learned other Romance languages rapidly when he needed them – such as Catalan in 1923. After briefly brushing up his Italian, he was able to hold his lectures in Italian with ease during his stay in Rome in 1942. And he was able to help his children with all their Latin homework texts without need of a dictionary. He had a good command of German and English, and he was reading and translating Dutch texts (Brouwer) for himself at an early stage. He similarly showed an interest in Norwegian when the occasion arose.

His musical talent meant he was able to attain an advanced level in piano playing. On the occasion of his trip to the USA, he played for composer and concert pianist, Dohnányi, who advised him to take up a professional career in piano playing. Dohnányi remained his role model when it came to Beethoven interpretations, while, for romantic piano literature, and particularly for Chopin and Schumann, he preferred the way in which A. Cortot and A. Brailowsky played, as well as W. Backhaus. From time to time, he played Chopin etudes on the grand piano in the family's apartment.

Colleagues, friends, students: In around 1935, in information that he provided about himself in English, he specifies scientific relations with Cartan, Hadamard (Paris), Nielsen (Copenhagen), v.d.Waerden (Leipzig), Hopf (Zurich) and Myrberg (Helsinki) for Europe and Birkhoff (Harvard), Veblen, Alexander and Lefschetz (Princeton) for America. He enjoyed friendship with, and admiration for a number of older colleagues, including Brouwer, Carathéodory and Kürschák. Friedrich Riesz (denoted and addressed as "Master" by his younger colleagues) and L. Fejér remained lifelong friends with Béla von Kerékjártó and his family. Béla von Kerékjártó received visits in Szeged from R. Wavre. G. de Rham from Switzerland and Sierpiński from Warsaw. Guests in Budapest included J. Piaget and Count Bompiani and later, Dolapchiev.

He maintained friendly contacts with married couples who were colleagues in Szeged: Miskolczy (psychiatry), Szent-Györgyi (biochemistry), Fröhlich (exp. physics), Förster (classical philology), Horváth (legal philosophy), Surányi-Unger (law) plus many more. Fellow students from earlier on, J. Szücs and M. Pintér, then working at the grammar school, were also frequent guests. At the same time, warm contacts were maintained with a number of officers' families (Baló[1], Szarka). He did not go on to develop a new social circle in Budapest on account of the events taking place. The war then brought people who needed help: first of all, in 1939/40, ones from Poland who conveyed news and left messages, ringing at the front door late in the evening, sometimes still in uniform, and then, later, a number of Hungarians who sought advice and protection. As of 1942/43, the number of French forced labourers fleeing to Hungary from the territory of the Reich increased. These included a number of mathematicians who did not wish to lose contact with mathematics entirely (Paul Lemaire). After the German armed forces marched into Budapest on 19 March 1944, they were forced to go underground.

The years 1945/46 showed what these friendships were really worth. From Geneva (R. Wavre and G. De Rham) came a call to a Chair then, later, when news spread about Béla von Kerékjártó's illness, he was assured of a place in a sanatorium in Leysin. American friends helped by sending parcels too. The lion's share of the help, however, came from Szent-Györgyi who contributed the most effective efforts to alleviate the family's dire hardship.

There are only a few colleagues or assistants who can call themselves his "pupils". He always regarded it as a major drawback that the Hungarian universities scarcely had any paid positions for up-and-coming scientists. Mathematical talents, who earned their living as grammar-school teachers, were scarcely able to develop their potential and keep abreast of the scientific sector abroad. He encouraged all those who came to him with a genuine scientific interest, but frequently saw this put to an end through existential hardship.

[1] Colonel Baló held responsibility in Section 21 of the Ministry of Defence from 1939 onwards (up until October 1943, when he was succeeded by Colonel Utassy) for the humane and liberal treatment of foreign refugees, and particularly those from Poland