The Complex Life of Alfred Pringsheim

K. C. Hannabuss

I t is curious that the life of Alfred Pringsheim (1850–1941) has attracted less attention from mathematicians than from literary and musical scholars. As a mathematician, Pringsheim made numerous contributions to analysis. He also fought and survived a duel, used his considerable inheritance to build up internationally admired collections of maiolica (tin-glazed pottery) and of gold and silver, and published some of the earliest transcriptions of Wagner's music. His fortune was ravaged by the Great War and the ensuing hyperinflation, and the Nazis, whose threat he had seriously underestimated, plundered his collections, leaving him, as a Jew with a son-in-law who was one of the most vociferous critics of the regime, in a very precarious position.

Pringsheim is remembered within mathematics for contributions to analysis and its applications to function theory and number theory. To him, as his friend and colleague Oskar Perron wrote, "we owe a series of foundational theorems, often very simple, and yet beautiful and fundamental theorems" [16].[1] His contributions helped provide classical analysis with firm foundations, which are sometimes undervalued compared with later developments built upon them.

Literary scholars are interested in Pringsheim because his daughter married the great novelist Thomas Mann, and over the last few years, Mann scholars have managed to unearth all kinds of otherwise lost documents relating to all his family and in-laws. The bicentennial of Wagner's birth in 2013 stimulated musical scholars to join this search, since Pringsheim had been one of the first supporters of Wagner's plans for Bayreuth. Many of the fruits of this work by musical and literary scholars are now readily available in popular books (mostly in German) [6, 9–12, 25, 30].

Pringsheim the Mathematician

Alfred Pringsheim, born on September 2, 1850, in Ohlau, near Breslau, in the kingdom of Prussia (now Oława, near Wrocław, in Poland), was the only son of Rudolf and Paula Pringsheim. His father had bought the failing East Prussian Railway Company and, by an astute long-term strategy, turned it around, contributing to the industrialization of East Prussia and becoming very wealthy in the process. In due course, Alfred inherited 13 million marks, bringing in a yearly income of 800 000 marks. (The modern value depends on which index of inflation one takes, but an order-of-magnitude estimate might be up to five times those figures in euros.) Despite this prospect of wealth, Alfred chose an academic career [11, Chapter 3]. A photograph of Alfred at about age 40 is shown in Figure 1.

Alfred had attended the Magdalenen-Gymnasium in Breslau, then studied mathematics and physics for a semester at the Humboldt University in Berlin in 1868

Figure 1. Alfred Pringsheim around 1890. (Courtesy of the Thomas Mann Archives.)

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before continuing in Heidelberg the following year, where in 1872, he was awarded the degree of doctor of philosophy. There was no requirement for a thesis, but he had been supervised mainly by Leo Königsberger, a student of Weierstrass, and also by Gustav Robert Kirchhoff. In the spring of 1877, his academic plans were almost derailed by a failed attempt at habilitation at the University of Bonn, but he was able, just a couple of months after that fiasco, on June 30, to gain habilitation at Munich. Gerhard Kowalewski recounted the episode thus [13, p. 187]:

> While Lipschitz was still alive, the later renowned function theorist Pringsheim wanted to habilitate in Bonn .... [Hermann] Kortum wanted to know how one solves a quadratic equation. On that the habilitand, immersed in the higher spheres of function theory, could not offer the least information. Other matters were discussed, which he knew well. But that was to no avail. His inexperience with quadratic equations could not be forgiven. He was rejected, and habilitated in Munich, a great loss to Bonn.

Habilitation in Munich gave Pringsheim the right to lecture there as a privatdozent, receiving no salary, but taking fees paid by those attending his lectures. (Given his private wealth, this was less problematic than for most young academics.) In 1886, Pringsheim became an extraordinarius (associate professor), and in 1901, ordinarius (full professor), both salaried posts. He held the latter position until 1922, when he became an emeritus and was succeeded by his former student Oskar Perron.

Pringsheim described his work in a 1915 *Lebenslauf* (curriculum vitae) [21] as follows:

> Although I was never a student of Weierstrass, I count as one of the most notable and ... most successful representatives of the specifically Weierstrassian "elementary" function theory. The majority of my works (which have appeared primarily in the Mathematische Annalen and Reports of the Munich Academy) are concerned partly with the arithmetic foundations of function theory, in particular the general theory of convergence of infinite series, products, and continued fractions, partly on the shaping of elementary function-theoretic methods and the extension of their applications. ... Of my other works, that on the Taylor series of real functions deserves a mention, for it brings the previously unsolved question of necessary and sufficient conditions to a successful conclusion.

Most mathematicians encounter some Pringsheim theorems and proofs when learning analysis. (The author's complex variable course included not only Pringsheim's proof that a power series $\sum a_n z^n$ with radius of convergence 1 and all $a_n \geq 0$ has $z = 1$ as a singular point [29, §7.21], but also two other quite different theorems.) Almost all will have seen Pringsheim's elegant, but usually unattributed, approach to proving Cauchy's theorem on integrating holomorphic functions around contours by first proving it for triangles; the article [4] describes some of the history of this theorem,

showing clearly how Pringsheim worried away at a problem, uncovering and plugging the gaps in purported proofs. The deficiencies that he spotted often arose from failures to appreciate when convergence and continuity needed to be uniform, a confusion not uncommon at the time. The result on Taylor series mentioned by Pringsheim in his Lebenslauf is probably his theorem that a smooth function f on the unit interval I ($f \in C^\infty(I)$) is real analytic ($f \in C^\omega(I)$) if and only if there exists a constant k such that

$$\left| f^{(n)}(x) \right| \leq k^n n!, \quad x \in I, \ n = 0, 1, 2, \ldots.$$

After describing him as one of the most zealous and successful German propagandists for the Weierstrass program, Oskar Perron continued a 1944 obituary of Pringsheim [16] as follows:

> We must say a word about Pringsheim's lectures, which encompassed all parts of analysis and also included number theory. They were carefully prepared down to the last small detail and were enlivened by many humorous and entertaining remarks, through which he kept his audience's rapt attention from beginning to end. One learned much in his lectures, and learning was made easy .... In 1916, he embarked on the publication of his lectures in printed form. In 1932, the monumental work was completed ... but this showed the reader who had earlier attended the lectures the difference between the written and spoken word. His lectures required his whole presence. One had to see the lively little man pacing up and down before the blackboard with chalk and sponge.

Apart from Perron, Pringsheim's most distinguished student was Fritz Hartogs (1874–1943), who provided foundational results in the theory of several complex variables.

The University of Heidelberg has in its archives a printed list of Pringsheim's mathematical works 1875–1933 donated by Pringsheim himself [23]. The first two papers, on the theory of hyperelliptic functions, appear to be the work which earned his doctorate, along with his habilitation thesis. Number 51 [19] was the last of a series on Cauchy's theorem. Pringsheim was also interested in the history of mathematics, on which he published a number of papers, and in 1896, he published a translation from Latin into German of Daniel Bernoulli's essay on a new theory of determining the value of chance events, together with a commentary [18]. (In 1939, Alfred gave his friend Constantin Carathéodory (1802–1879) a very rare copy of a communication of the solution to the isoperimetric problem sent by Jacob Bernoulli to his brother Johann.) Overall, there are 106 items in this bibliography, of which the last two comprise the five parts of his two-volume *Vorlesungen über Zahlen- und Funktionenlehre* [22], mentioned by Perron.

In 1933, Pringsheim sold his mathematical library of around 2671 items, and the catalog of sale has recently been unearthed, giving an insight into just how wide his interests were and the wealth of historic literature he had

available [3, 7]. In summary, the catalog is divided into three major parts: 135 items on the history of mathematics, and of the remainder, 605 items published before 1800, and 1931 published after 1800. The earlier works included 40 editions of Euclid, first editions of Tartaglia, Napier, Briggs, Newton, Wallis (*Opera Mathematica*), 15 works by Lagrange, and 35 by Euler. The breadth and scope of his collection after 1800 will be clear from this small sample: Grassmann *Ausdehnungslehre*, H. J. S. Smith *Collected Mathematical Papers*, Russell and Whitehead *Principia Mathematica*, P. A. MacMahon *Combinatory Analysis*, Born and Jordan *Quantenmechanik*, as well as works by Gauss, Jacobi, Hilbert, Klein, Lie, and Lebesgue.

Pringsheim's colleagues in the Mathematics Department at Munich included Ferdinand von Lindemann (1852–1939), who proved the transcendence of π, Aurel Voss (1845–1931), and later Oskar Perron (1880–1975), Constantin Carathéodory, and Heinrich Tietze (1880–1964), as well as Arnold Sommerfeld (1868–1951) and Walter Gerlach (1869–1979) in the Physics Department [2].

Mathematics or Music?

Given how prolific a mathematician Pringsheim was, it is perhaps surprising that he had initially been unsure whether to pursue a career in mathematics or in music. He was an accomplished pianist and a great Wagner enthusiast. His book *Richard Wagner und sein neuester Freund* (Richard Wagner and his newest friend) [17] received an enthusiastic review by Wilhelm Langhans (1832–1892) [30, pp. 89–121, 129–130]:

> Richard Wagner could scarcely wish for a better defense advocate than he has found in Pringsheim. The gift of acute observation, an elegant style, but at the same time aiming directly at his targets, warm enthusiasm for his subject without wounding attacks on those who disagree, those are the characteristics which spring into view on every one of the fifty-five pages of this pamphlet, equally for the musical and the unmusical.

In 1871, Pringsheim was among the first subscribers, possibly the first, to Wagner's Bayreuth Opera House. He attended the council meeting in Bayreuth the following year, the laying of the foundation stone in 1874, and then the first complete cycle of the *Ring of the Nibelungen* in 1876 [11, p. 58]. His diary for that visit to Bayreuth, July 5–21, 1876, is a valuable source of information about that event [30, pp. 146–159].

While in Bayreuth, Pringsheim not only attended the performances and rehearsals but also studied the score of the *Ring* carefully and began to make transcriptions, one for two pianos and another for piano quintet. A dozen of his forty-four transcriptions were published, but he often played the others with friends or family. In the course of the bicentennial celebrations of Wagner's birth, most of these transcriptions were traced [30, pp. 197–199], and recordings of "Siegfried's Funeral Music" and "Brünnhilde's Immolation" from *Götterdämmerung* are now available on CD [28]. Throughout his life, Alfred continued with an hour or so of piano practice each day, and by his eighties was often partnered in works for two pianos by Ruth Gerlach, the wife of his physics colleague.

But shortly after his visit to Bayreuth, Alfred Pringsheim reached a decision: in his words, "To the advantage of music, I decided on mathematics" [11, p. 58]. This was not a reaction to hearing the Ring cycle, for he remained all his life a passionate Wagnerian whose letters from the composer were a prized possession, but probably to some other events that occurred during his two-month stay in Bayreuth.

One of these was the so-called Schoppenhauer incident at Angermann's Bierlokal in the evening of August 16 [8, pp. 62–29]. Besides playing on the name of the philosopher Schopenhauer, Schoppenhauer means roughly "beer-mug basher," and a cartoon published in the satirical magazine *Kladderadatsch* on September 3, 1876, illustrates a beer-mug striking a face [8, p. 62]. The hand was Alfred Pringsheim's, for Bayreuth had attracted not only Wagner enthusiasts, but detractors as well. One of these had made derogatory comments about a single Strauss waltz being better than the whole *Ring*, and when the quick-tempered Pringsheim responded, further provoked him by suggesting that he had clearly drunk more beer than he could handle. Alfred thrust his beer mug into the face of the insolent heretic. His victim was not seriously hurt, but Pringsheim ended up having to fight a duel with one of his friends, probably Dr. Isidor Kastan (an art critic for a Berlin newspaper). They agreed to postpone the encounter till after the end of the *Ring*, and the duel eventually took place on October 9, in Berlin-Grunewald. Unlike another famous mathematical duel, this one ended well: the combatants had agreed to fire three shots each, and each of them missed the other thrice, so that honor was satisfied without any injuries. Pringsheim kept the pistols and showed them years later to Thomas Mann; they may have inspired the description of the pistols in the duel between Naphta and Settembrini in Mann's novel *Der Zauberberg* (*The Magic Mountain*). Pringsheim's wife, observing this display, told him, "I would never have married you if you had shot him." "You wouldn't have married him either," retorted Alfred [8, p. 77].

Marriage

Shortly before visiting Bayreuth, Alfred had seen a Meiningen Theatre performance of *Romeo and Juliet* with a beautiful young actress, Hedwig Dohm, playing Juliet [11, p. 42] (Figure 2). (The duke of Saxe-Meiningen had made Meiningen a center for the arts; it was there, a year or two later, that Brahms's fourth symphony received its premiere and there that the composer met the clarinetist Richard Mühlfeld, who inspired his late works for that instrument.) Hedwig's father, Ernst Dohm, was a founding editor of *Kladderadatsch* (which may help explain why that magazine reported on the Schoppenhauer incident), and her mother, Hedwig, was a writer and novelist whose writings on women's rights have now made her an icon for the German feminist movement. Although not wealthy, they

were well known in Berlin society, and their soirees helped introduce their daughter to many of the leading figures of the era. The young Hedwig heard Liszt play in Bayreuth, and once shared a room in Weimar with Liszt's then mistress [11, p. 19]. She even posed as a stand-in for a portrait of the Prussian crown princess Victoria, and through that engagement came to know most of the Kaiser's family [11, pp. 25–26].

Alfred Pringsheim, who had a soft spot for actresses, opera singers, and dancers, soon began courting her. As soon as he had completed his habilitation and become a privatdozent in Munich, he applied to the university for permission to marry. No doubt aided by his prospect of wealth, the university saw no objection and granted its permission. The couple were married on October 23, 1878.

In 1890, Alfred had a splendid new Italian Renaissance house built in the Arcisstrasse at one corner of the

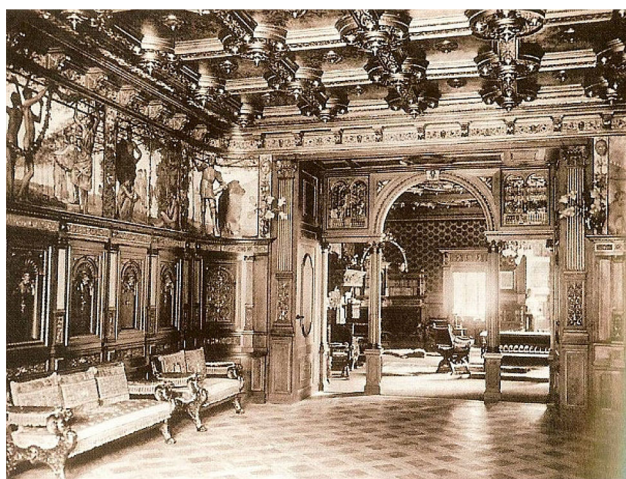**Figure 2.** Hedwig Pringsheim c. 1876. (Courtesy of the Thomas Mann Archives.)

Figure 3. The Palais Pringsheim music room. (Courtesy of WikiCommons.)

Königsplatz in Munich [6, p. 10]. Although built in an antique style, this Palais Pringsheim was one of the first in Munich to have electric lighting, a telephone, and central heating, and Alfred turned it into a temple of the arts. Their guests often included Gustav Mahler, Richard Strauss, and Bruno Walter. The music room (Figure 3), with two grand pianos, was large enough to accommodate an audience of 150, and Alfred commissioned for it an art nouveau frieze by Hans Thoma. Portraits of his wife, mother-in-law, and children were executed by the well-known society portrait painter Franz von Lenbach, whose studio lay just across the Königsplatz. In addition, he displayed his collection of gold and silver work by fifteenth- and sixteenth-century German smiths and his collection of Italian maiolica. The latter was regarded as the finest such private collection in the world [26, 32].

Alfred and Hedwig Pringsheim had five children: Erik (1880–1909), Peter (1881–1963), Heinz (1882–1974), and the twins Klaus (1883–1972) and Katia (1883–1980). Erik and Katia will appear in the next two sections, and of the other three, Peter became a physicist; Heinz first trained as an archeologist, but then switched to musicology; and Klaus became a conductor and composer.

Their grandson Klaus Mann recalled visits to the Pringsheims [15, p. 18]:

> Professor Pringsheim—small in stature, exceptionally nimble and lively—shocked and entertained the guests with sarcastic comments and puns, often of a somewhat risqué nature. His hoarse croak [he was a chain smoker] would be joined by the high melodious protest of his cheerfully indignant spouse: "Oh, Alfred, how frightful you are again."

The Pringsheims were keen cyclists (Figure 4), and they often made cycling tours, including a wide-ranging tour in England, one following the Rhine, and two in Norway. Describing their 1907 visit to Norway, Hedwig wrote years later [24]:

> My husband is a mathematician and, as such, ended up in the gutter more often than his cycling prowess

Figure 4. Erik, Heinz, and Peter Pringsheim on their tandem bicycle. (Courtesy of the Thomas Mann Archives.)

would have led one to expect. But solving mathematical problems and reliable control of the handlebars cannot always be combined. However, when the gutter is a steep drop into an abyss with a mountain torrent in its depths, the situation is somewhat more precarious. And at just such a place I saw the cyclist in front of me wobble and fall with his bicycle. I could only scream and close my eyes, as I did not wish to witness the horror. But mathematicians and children seem to have their own guardian angels, for when I opened my eyes again, my mathematician did not lie broken in the ravine, but lay, somewhat shaken, wedged between two curbstones that had saved him from certain death.

A Family Tragedy

The eldest son, Erik (Figure 5), was his mother's special favorite, but as he reached his late teens, it became clear that although he was very intelligent, he had a weakness for women and gambling, and there seemed to be some psychological problem underlying the latter. In 1897, he matriculated at Oxford to read law at Balliol College, but left after two of the three-year program. (German students often completed only part of a course before moving to another institution, and the Balliol dean's records do not suggest any misconduct.)

Erik then enrolled at a succession of German universities, but he kept incurring large gambling debts. Things came to a head in 1905, when it transpired that he had accumulated debts of 50 000 marks and was about to be arrested for writing bad checks.

Initially, Hedwig tried to keep this from her husband, but when he eventually heard about it, Alfred, in an unexpected fit of generosity, paid the debts. It was, however, clear that things could not be allowed to continue like

this, and from consultation with others, the parents determined that the usual remedy for wayward sons was to dispatch them to South America to start a new life, and if they managed to reinstate themselves, they could then return [12].

Erik chose to be exiled to Argentina, and his father stood ready to set him up with a farm there. However, when his mother visited him in 1907, she discovered him to be living in dire poverty and deep debt. She sorted things out as best she could and took him on a transcontinental excursion to Chile before returning with him to Buenos Aires. (Her detailed descriptions of her travels and scenery in her journal of that visit were later exploited by Thomas Mann in his 1954 novel *Die Bekenntnisse des Hochstaplers Felix Krull* (*The Confessions of Felix Krull, Confidence Trickster*) [12, p. 9].)

It came as a complete surprise to her when Erik informed her a couple of months later that he had married. Negotiations went on that enabled him to buy a farm with the help of 165 000 marks from his father. Then a few months after that came the news that he was dead. His widow claimed that he had committed suicide, having incurred further gambling debts, but Hedwig, devastated by the loss of her eldest son, suspected foul play: the surprise marriage had been to a gold-digger, who had then aimed to get her hands on his money (or share of his inheritance) either by killing him herself or perhaps getting a lover to do so. This idea was bolstered by the widow's repeated requests for money, emerging doubts about her true identity, and that she might have contracted a bigamous marriage. Hedwig had the body returned to Germany for an autopsy, which, however, found nothing conclusive, and Erik's death hung like a dark cloud over the whole family thereafter [12].

Thomas Mann

Thomas Mann (Figure 6) was the second son of a patrician family in Lübeck whose decline he portrayed in his bestselling 1901 novel *Buddenbrooks*. By the time of his success, Mann was living in Munich, and in due course he was invited to visit the Pringsheims. He described his reaction to his first visit in a letter dated February 27, 1904, to his brother Heinrich (also a novelist): "The Pringsheims are an overwhelming experience. A zoo with genuine culture."
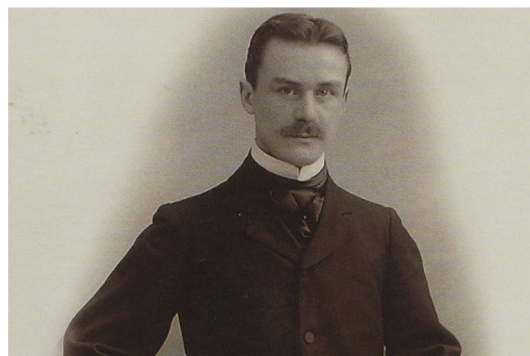

Figure 5. Erik Pringsheim in Argentina. (Courtesy of the Thomas Mann Archives.)

Figure 6. Thomas Mann around 1900. (Courtesy of the Thomas Mann Archives.)

Figure 7. Katia Pringsheim at around the time of her engagement. (Courtesy of the Thomas Mann Archives.)

Mann felt it was about time to settle down, and he found Katia Pringsheim (Figure 7) beguiling: "Katja is a miracle, something indescribably rare" [1]. She had been the first woman in Munich to pass the Abitur—the examination that permitted one to enroll in a university—and, encouraged by her father, was at this time studying mathematics and physics at the University of Munich [10].

Although Mann knew her by sight, they first met at a soiree hosted by Max and Elsa Bernstein. Elsa was a friend of Hedwig Pringsheim and also an acclaimed writer, who adapted her 1895 play *Königskinder* to create the libretto for Engelbert Humperdinck's 1897 melodrama and 1910 opera of the same name.

The Pringsheims were divided over Mann's suit. Alfred had little interest in literature, and in particular not in Mann's novels. He had always imagined that his only daughter, to whom he was close, would marry a professor. (Katia had several suitors, and there were rumors that she was really interested in Oskar Perron. But he was only a couple of years older than Katia and too insecure in his career to consider marriage yet.) Hedwig, on the other hand, was less musical but deeply interested in literature. She did not try to force Katia's choice, but she did assist Thomas Mann in gaining access to her. Katia's twin, Klaus, favored the match too, while the other brothers avoided taking sides. (Alfred's parents were Jewish, but he described himself as "Mosaic, nonpracticing." Hedwig's parents were also Jewish but had been baptized, and their daughter and all her children were baptized Lutherans, as was Mann, so there were no religious obstacles to the match.)

When Thomas Mann proposed to her, Katia asked for six months to think things through. At the end of that period she accepted him, and they were married on February 11, 1905. Katia continued with her mathematics course for a few more months, until she was expecting their first child.

Despite sharing a love of Wagner, the relations between Alfred and his son-in-law were always strained, and he never used the familiar "Du." In a special address to the Royal Bavarian Academy of Science in 1904, "The Value and Alleged Worthlessness of Mathematics" [20], Pringsheim considered attitudes to mathematics, and in particular, the contempt for the subject displayed by Schopenhauer, one of Mann's favorite philosophers. With his wide knowledge of the history of mathematics, Pringsheim was able to show that Schopenhauer had quoted other authors out of context or willfully misquoted them. Schopenhauer had also objected to Euclid's proof of the Pythagorean theorem and suggested a much simpler, more obvious one, which, as Pringsheim observed, covered only the case of right-angled isosceles triangles.

Mann was not always sensitive to the danger that readers who recognized the finely observed location of a story might think that it depicted what happened as accurately as where. In his novella *Wälsungenblut* (*The Blood of the Walsungs*), written in 1906, the Walsungs of the title are Siegmund and Sieglinde from the second opera of Wagner's *Ring*, who, unaware that they are twins, commit incest. Mann's story takes place in a wealthy Jewish household one evening, when, after a trip to the opera (the aforementioned Wagner, of course), the twin brother and sister get carried away and commit incest on a bearskin rug. The description, including the bearskin rug [6, p. 15(2a)], matched the Palais Pringsheim so well that even before publication, rumors began circulating about the relationship between the Pringsheim twins Klaus and Katia. Hedwig Pringsheim and Klaus had read the draft as it was written and just found it amusing, but when Alfred was informed, he hit the roof. He requested an interview with his son-in-law, which ended with Mann phoning his publisher to withdraw permission to publish (with Alfred presumably paying the compensation). There was a rumor, denied years later by Klaus Mann in his memoir *Der Wendepunkt*, that during their interview, Alfred had threatened Thomas with a revolver.

This development was somewhat frustrated by the fact that the publisher, instead of pulping the old proof sheets, used them as wrapping paper, and soon pirate copies were circulating. Eventually, the novella was published, in 1921, with a series of illustrations by Thomas Theodor Heine that make the similarity to the Pringsheims even more explicit. Writing years later, Katia observed that if her husband had suspected any such relationship between her and her brother, he would either have left her or kept quiet, but would certainly not have publicized it [10].

Mann's novels include numerous references to mathematics and, even before he knew the Pringsheims, the novella *Der kleine Herr Friedemann* (1898) contained an accurate reference to parallels in non-Euclidean geometry [27]. The 1909 novel *Königliche Hoheit* (*Royal Highness*) is a sort of fairy story about his marriage: a crown prince is seeking a bride when a wealthy American, Samuel Spoelman, arrives with his clever daughter, Imma, who is studying mathematics. Mann describes the prince's reaction to her exercise book:

A fantastic hocus pocus, a witches' sabbath of entangled runes ... Cabbalistic signs, completely incomprehensible to the uninitiated, embraced in their arms letters and numbers, while fractions stood before them, and numbers and letters floated about their heads and feet ....

Undeterred, the prince eventually marries her.

A better-known comment appears in *Der Zauberberg* (1924), set in a tuberculosis sanatorium in Davos, in the Swiss Alps. To the head of the sanatorium, Hofrat Behrens, is attributed this wisdom: "I preach Mathematics .... The occupation with mathematics is, I say, the best antidote to the lusts of the flesh." The novel was actually based on Katia's stay in the Waldsanatorium Davos from March to September 1912, due to a misdiagnosis. (Hedwig Pringsheim commented in a letter [25, 2.8.1912] that "between ourselves, my friend, I regard Davos as a swindle.") Thomas Mann visited her there for several weeks, and apparently, the actual director of the sanatorium, Dr. Friedrich Jessen, made a similar comment on the power of mathematics to curb carnal lust, albeit limiting its efficacy to men [27]. It is therefore quite possible that Katia or Thomas had heard him expounding his views on the subject while they were there.

Hedwig's Correspondence with Maximilian Harden

An edition of the diary that Hedwig Pringsheim kept for almost six decades has recently been published [9], but perhaps an even more intimate insight into the life of the Pringsheims is found in Hedwig's long correspondence with the political journalist Maximilian Harden [25], who was said at the beginning of the twentieth century to be the best-known German after the Kaiser. They exchanged letters from 1900 till 1922, when another piece of Thomas Mann's insensitivity so annoyed Harden that he stopped writing [25, pp. 370–372].

Hedwig seems to have been relaxed about Alfred's infidelities:

- 26.3.1908: "Alfred is seeing the charming Indian dancer Ruth St Denis for the second time this week (for short men such immeasurably long limbs possess an irresistible enchantment)."
- 27.7.1908: "He [Alfred] is otherwise engaged, as enraptured as a young schoolboy with a little singer .... A nice lass, the little Ella Tordek, nothing of Milka's majestic splendor."

(Milka was Milkatz Ternina, a singer at the opera in Munich with whom Alfred had an affair for some years from about 1892. Hedwig liked her, and corresponded with her until her death, long after Alfred had lost interest.)

The letters also contain some epistolary flirtation by Hedwig, and invitations to Harden to visit her ("Alfred wouldn't mind"), though she makes it clear that she doesn't seriously expect that he will come. Earlier, rumors of an affair between Hedwig and Astaf, Baron von Transche, were sparked by her mother's play *Sibilla Dalmar* (1896/7),

whose eponymous heroine bore a strong resemblance to Hedwig [11, pp. 99–102]. Hedwig's letters to Maximilian Harden contain just a few references to the baron, whose "heavenly Baltic accent stole my heart" [25, 21.9.1918].

Hedwig usually accompanied her husband to meetings of the Deutsche Mathematiker-Vereinigung (DMV), such as that in Stuttgart (1906), and to International Congresses in Europe, such as the 1908 Cambridge Congress. Among the many mathematicians she got to know at those events was David Hilbert, with whom she corresponded over many years [25, p. 320]. He is first mentioned in a letter to Harden in 1906:

- 27.9.1906: "By the way, in Stuttgart I have definitely betrothed myself to David Hilbert from Göttingen. One never grows out of these childhood diseases."
- 8.10.1906: "even the betrothal to Hilbert ... was just a fleeting pleasure."
- 4.3.1916: "I received a charming letter from the colossally clever Professor Hilbert from Göttingen, of whom I told you ...."
- 7.4.1917: "Yesterday I received a letter from the Göttingen mathematician whom I've occasionally mentioned, and with whom, apart from you, I can most easily make myself understood. This bon vivant, despite war and the noise of war, enjoys his life in an astonishing way, and uses all the holidays for glorious trips to Switzerland. Now he has written me a complete love letter from Lugano, in which he suddenly addresses me as 'Dearest Hedwig,' as if he has always done so, and uses the familiar *Du*. I fell off my chair with pleasure, and my husband killed himself laughing."

An Inheritance Lost and Plundered

The war years from 1914 to 1919 brought shortages of everything as the Royal Navy cut the supply routes to Germany. In April and May 1919, in the aftermath of the war, an attempt to set up a Soviet-style republic (a so-called *Räterepublik*) in Munich was soon crushed by the army. Hedwig was a pacifist, but Alfred was a patriot and had moved much of his wealth into war bonds. With the political collapse at the end of the war, those bonds lost all their value.

From 1921 to 1923 there followed a period of hyperinflation—even a postage stamp could cost several billion marks. Eventually, on November 15, 1923, a new currency was introduced at the exchange rate of one rentenmark to one trillion of the old marks. This wiped out most of the little that was left of Alfred's inheritance. Had he not changed his shares in the East Prussian Railways into war bonds, those might have retained some value, but now there was almost nothing except an expensive house and his emeritus pension.

Fortunately, some works of art in his house were still valuable, and so the Pringsheims decided to sell a painting from time to time to pay living expenses. It was at this period that Alfred first quipped that "wir leben von der Wand in den Mund" (we live from wall to mouth), a word

play on "wir leben von der Hand in den Mund" (we live from hand to mouth).

In 1929, Thomas Mann was awarded the Nobel Prize in Literature. He was in demand as a speaker and did not hesitate to make known his dislike of the National Socialists. When Hitler became chancellor in 1933, Thomas and Katia were on holiday in Switzerland following some overseas lectures, and their children advised them not to return. They therefore went into exile, first near Zurich, then Princeton, and finally Pacific Palisades, a neighborhood in the Westside region of Los Angeles, California, before returning to Zurich after the war.

An early act of the Nazi government was the compulsory purchase of all the houses along the Arcisstrasse side of the Königsplatz [11, pp. 193–194], [15, p. 415], one of the few seizures of property that was not racially motivated, since all residents were moved to make way for two massive buildings, the Führerbau and the Verwaltungsbau (administrative building). Apparently, the 1938 Munich Agreement was signed in a room on the site of what had been the Pringsheims' music room. An immediate consequence for Alfred was that he decided to sell his mathematical library, which would not fit in their smaller apartment.

In 1934, all civil servants, including emeriti, were required to take an oath of allegiance to the new government. Alfred Pringsheim declined to do so and so lost his emeritus status and a third of his pension [11, pp. 203–204]. Katia urged her parents to join them in Switzerland, but although Alfred began to sense the dangers lying ahead, both he and Hedwig felt that the younger generation had ridiculously overestimated the threat [15, p. 415]. Hedwig was also reluctant to lose all her friends and thought that they could manage with their new smaller apartment and reduced income.

Moreover, there were some happier moments, as when members of the mathematics and physics departments came to celebrate Alfred's 85th Birthday in 1935, and an anonymous appreciation of his work (apparently written by Constantin Carathéodory) appeared in the *Kölnische Zeitung*, though Alfred was disappointed that there was only one. Celebrations of the Pringsheims' diamond wedding in 1938 were attended by members of the mathematics and physics departments (including the Perrons, Sommerfelds, Gerlachs, Carathéodorys, Tietze, and Hartogs) [11, p. 217]. Such loyalty demonstrated by his colleagues should not be taken lightly: they were breaking the law that forbade any contact between civil servants, including academics, and Jews.

On Kristallnacht, the night from to November 9 to 10, 1938, the Pringsheims had a visit from the SS,[2] who, surprisingly, merely confiscated their radio, but shortly thereafter, Alfred's collection of silver and gold was seized. (A looted portrait of Hedwig was found marked to go to Hitler's planned museum in Linz, presumably in ignorance of the fact that the sitter was not Aryan [6, pp. 28–31]. An oil and pastel version appears in Figure 8.)

Figure 8. Lenbach's oil and pastel portrait of Hedwig, whose companion oil painting was seized for Hitler's planned gallery in Linz. (Courtesy of the Thomas Mann Archives.)

The fact that the Pringsheims were treated relatively gently was probably due to help from rather unlikely sources. Winifred Wagner was English born but brought up by distant relatives in Germany and had married Siegfried Wagner, the composer's son. She lived in Bayreuth and got to know Hitler in the 1920s, and soon they became close friends. Even after becoming chancellor in 1933, Hitler liked to visit Bayreuth to relax with Winifred and her family.

In the preface to her recent biography of Winifred Wagner [5], Brigitte Hamann explains that she went into the project thinking of Winifred as an unrepentant friend and apologist for Hitler (which she was), but researching the book had revealed another quite different side. By 1933, Winifred was a widow and had taken over running the Bayreuth Opera House. Many of their best artists were Jewish, and much of their financial support also came from Jews. Nazi antisemitism made life difficult, and Winifred herself was not antisemitic. She managed for a year or two to keep Jewish performers in Bayreuth, and as this gradually became known, she began to receive many requests for help, including from the Pringsheims, whom she knew. When she thought that she could help in such a case, she tried to do so [11, pp. 206–207]. Her strategy was to find a Nazi official with the power to do something and then make her request. The officials, aware that Winifred had the Führer's ear, and looking to their own backs, would usually help out of fear that otherwise, she might denounce them to Hitler. In this way, Hedwig's now frail and blind friend Elsa Bernstein was diverted to the showcase camp Theresienstadt, where she survived the war, rather than

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[2]The *Schutzstaffel*, the Nazi regime's feared paramilitary organization for security, surveillance, and repression.

being sent to one of the other eastern concentration camps, such as Auschwitz. At her trial after the war, fifty-two letters of support for Winifred were submitted by those such as Elsa whom she had assisted.

The Final Act

The pressure on Jews mounted inexorably. In 1939, their strict curfew was extended; that same year, Alfred got his new identity card, which, not content with a "J" stamp, also added the extra name Israel, which beginning in 1939 was given to all Jewish men with non-Jewish names, with the requirement that he henceforth sign himself Alfred Israel Pringsheim [11, Figure 40]. Hedwig should have acquired the additional name of Sara, but she somehow avoided it by wearing the officials down sufficiently that she obtained an Aryan pass. The steadily increasing restrictions, and in particular, the fact that the regime now made it impossible to visit Katia and Thomas, forced Hedwig to realize at last that they must leave [15, p. 534].

Had they left when first urged to do so, the Pringsheims would still have had enough money for a comfortable life in Zurich [15, p. 827], but no longer. Their passports had already been canceled early in 1937, making it even harder to leave Germany. Although he had lost his gold and silver collections, Alfred had been able to arrange to have Sotheby's in London auction his maiolica collection, comprising 394 pieces and recognized as the most complete and valuable in the world.

Unfortunately, due to what Mann described as a *Gangstervertrag*, he was forced to sell at the bottom of the market, and the sale raised only £20 000, far less than he had hoped and less than he had paid for the pieces. Moreover, he had to pay both the auctioneer's commission and an 80% tax. (A modern valuation estimated that the 49 pieces in the United States alone would be worth €14.4 million today [33].) Nonetheless, it did bring him £2997, or 3500 marks, which was enough to pay the exit tax required of those departing from Germany, but unfortunately, Alfred and Hedwig lacked the papers to leave and had only a few more days to do so, when SS Obersturmführer Otto Rudolf Hess arrived with orders to empty the house where they now lived to make room for yet another government building (the third time this had happened).

Finding that he wanted the apartment cleared, and the occupants wanted to leave but were unable to obtain the necessary exit papers, Hess flew to Berlin and went straight to the ministry, returning two days later with the relevant documents, just in time for Alfred and Hedwig to cross into Switzerland on the very last day possible. As Hedwig put it in a letter to Katia, "God bless the Obersturmführer." (The family believed that Winifred Wagner had also helped again, and their former neighbor, Karl Haushofer, may also have interceded for them.) When Hess later tried to assist another Jewish couple, he was noticed, stripped of his rank, and sent to fight in Greece, where, although badly injured, he survived the war.

On October 31, 1939, seen off by the Perrons and accompanied as far as the border by their son Heinz (their only child still in Germany), the Pringsheims crossed into Switzerland in the nick of time, just hours before the border closed. Despite their valid exit documents, the German border guards strip-searched Alfred and subjected him to "sadistically brutal treatment" before letting them proceed. More setbacks followed on the Swiss side when Alfred had a bad fall as he left their railway carriage in Zurich. Moreover, their letters to the family and hotel had gone astray, so nobody was there to meet them, and the accommodation they thought they had booked was already taken. Fortunately, the Swiss proved as helpful as the Germans had been obstructive, and found them good alternative hotel rooms and suitable transport for Alfred. They later settled in the Rotes Schloss, an old-people's home in Zurich [11, pp. 230–231].

The German attack on France in May 1940 sent Alfred into a profound depression, but there were happier occasions such as the birth of a great-grandson, Frido Mann, on July 31, 1940, though Alfred and Hedwig never saw him. (In 1966, Frido married Christine Heisenberg, daughter of the physicist Werner Heisenberg.) At Alfred's 90th birthday celebration on September 2, 1940, musicians from the Tonhalle Orchestra played his piano quintet transcription of Wagner's *Siegfried Idyll*.

Alfred died in his sleep on June 25, 1941. Hedwig Pringsheim followed a year later on July 27, 1942. Efforts by their heirs for restitution or compensation for the Nazi plunder of Alfred's collections continue, with only very limited success [33].

K. C. Hannabuss
Balliol College
Oxford OX1 3BJ
UK
e-mail: kch@balliol.ox.ac.uk

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