Paul Wolfskehl and the Wolfskehl Prize

Klaus Barner

Paul Wolfskehl, ca. 1880.

To the question often posed to Andrew Wiles in interviews—namely, what fascinated him so greatly in the Fermat conjecture—he seldom refrained from answering by emphasizing the long history of this problem. When I asked him the same question in Boston in 1995, he answered, "Because of its romantic history." When I then went further and asked him to explain to me in more detail what he meant by romantic, he answered merely, "Because Fermat said he had a proof, but none was found." That Wiles avoided answering in detail what is so romantic about the history of Fermat's Last Theorem reflects the fact that *he* also has a particularly romantic part to play in this story. The first time that I became aware of this was on October 28, 1995, the day after the awarding of the Prix Fermat to Wiles in the Salle des Illustres in the town hall in Toulouse. It was the last true day of autumn, with striking blue skies and temperatures worthy of summer, when Andrew Wiles visited the house in which Fermat was born in Beaumont-de-Lomagne. There he found the people in the highest of spirits on account of his mastering of this ancient enigma, and he was truly the man of the hour in this small relaxed town in the south of France, whose character had scarcely changed since the time of Fermat himself: Andrew had met Pierre.

Wiles also met the romance in the history of Fermat's Last Theorem on June 27, 1997, in Göttingen, where he was presented with the Wolfskehl Prize by the Academy of Science. Gerhard Frey gave the closing lecture, "On the Fermat problem, the conjecture of Taniyama and the theorem of Wiles". Since so much nonsense has been written about this prize and also about its donor Paul Wolfskehl, even by respected authors, and taken up blindly by other authors, I now see, through the presenting of this prize and the public awareness that goes with it, the last opportunity to do Paul Wolfskehl and his donation the justice they deserve.

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"This article is an updated and revised translation of my paper 'Paul Wolfskehl und der Wolfskehlpreis', Mathematische Schriften Kassel, Vordruckreihe des Fachbereichs 17, Preprint Nr. 4/97, March 1997. I would like to thank Alex Reckless for his valuable help during the process of translating.

In my attempt to learn more about Wolfskehl and his family, I have been greatly assisted by Kurt-R. Biermann, Eckhart G. Franz, Erhard Heil, Paul Hoffmann, Charlotte Kühner-Wolfskehl, Sabine Rickmann, Heinz Georg Wagner, and Ingeborg Wolfskehl. I thank them all deeply. Special thanks go to Ingeborg Wolfskehl for letting me have a copy of the possibly last existing photo of Paul Wolfskehl."

—Klaus Barner

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Paul Friedrich Wolfskehl was born on June 30, 1856, in Darmstadt as the younger of two sons to the wealthy Jewish banker Joseph Carl Theodor Wolfskehl (1814–1863). Paul's mother, Johanna Wolfskehl, was the daughter of the Stuttgart *Hofbankier*[1] Nathan Wolf Kaulla. Paul's elder sister, Fanny Marie, died in 1855 at the age of only fifteen. His elder brother, the jurist Wilhelm Otto Wolfskehl (1841–1907), took over the bank in 1865 following the death of their father and ran it as an independent company until 1881.

Paul Wolfskehl, on the other hand, studied medicine in Leipzig, Tübingen, and Heidelberg from 1875 to 1880, where he gained his doctorate in medicine, probably in 1880. The theme of his dissertation is unknown, yet a paper by Dr. P. Wolfskehl [29] dealing with the characteristics of horizontal slit-shaped pupils in calves and the corresponding vertical pupils in cats, from the laboratory of the Heidelberg eye clinic, appeared in the *Journal of Comparative Ophthalmology* in 1882. This could be an excerpt of his thesis. The photo on page 1294 shows Paul Wolfskehl around 1880. It is probable that at this time the symptoms of multiple sclerosis first showed themselves in him. As a physician it soon became clear to him that he would not be able to practice as a doctor in the long term. He then decided, one may presume, due to this handicap, to study mathematics. Mathematics was certainly a subject in which he would be able to work, even if bound to a wheelchair.

Initially he studied in Bonn in 1880 and then switched in 1881 to Berlin. It was there until 1883 that he attended lectures given by, amongst others, the then seventy-one-year-old Ernst Eduard Kummer (1810–1893). Kurt-R. Biermann reports ([5], p. 26) that Kummer did not cease giving lectures until the winter term 1883–1884 at the age of seventy-three. Under the influence of Kummer, Paul Wolfskehl turned to number theory, in particular algebraic number theory. It is obvious that he learned about the Fermat conjecture in this time. It is also a fact that he studied in depth Kummer's relevant papers. That Kummer succeeded even at this age to arouse interest for number theory and the Fermat problem in his students can also be proven through the activities of another of his pupils from that time ([4]). The Jewish doctor Albert Fleck (1861–1943), who was from Berlin, studied mathematics and physics initially (1881–1885) and medicine later (1886–1891), all at the University of Berlin. Dr. Fleck, blessed with many children, later earned his living as a medical doctor. His free time, however, he devoted to mathematics, in particular to his love for number theory. I shall talk later of the important and highly original role he played in the context of others' attempts to prove the Fermat conjecture. It is somewhat improbable that fellow students Albert Fleck and Paul Wolfskehl did not know each other personally.

[1] *court banker*

Andrew Wiles talking to the people of Beaumont, France, in the marketplace, October 28, 1995.

The house where Fermat was born in Beaumont-de-Lomagne—preparations for signing the "golden book" of the town.

On whether Wolfskehl himself attempted to prove Fermat's Last Theorem we can only speculate, but it is natural to think that this was the case. In his book *Mathematical Cranks* Underwood Dudley writes ([10], p. 109): "Somehow the eye of Dr. Paul Wolfskehl was caught by the FLT (that Fermat's Works were published in Paris in 1891 may have had something to do with it), and when he died in 1908 his will provided a prize of 100,000 marks to be given to the first person to prove the theorem." Disregarding the fact that the year of Paul Wolfskehl's death is wrongly given, Dudley does not seem to know that Wolfskehl studied in Berlin under Kummer and gave lectures on number the-

ory at the *Technische Hochschule*[2] Darmstadt from 1887 to 1890. Erhard Heil reports [14] that Wolfskehl received his *habilitation*[3] in Darmstadt in 1887, possibly with the paper [30] from algebraic number theory that is also mentioned in Hilbert's celebrated "Zahlbericht" ([15], p. 227). This, however, seems to me improbable, since this paper is at the approximate level of a *Staatsexamensarbeit*[4] and therefore an extremely thin basis for a habilitation, keeping in mind the fact that his doctorate was not even in mathematics, but rather in the field of medicine. Paul Wolfskehl's great-nephew, the *Diplomphysiker*[5] Otto Wolfskehl, writes in an essay "Vorfahren und eigene Familie"[6] ([28], p. 146): "His papers caused the Faculty of Sciences at the Technische Hochschule Darmstadt to ask him to give special lectures on number theory." This does not sound like a habilitation, but rather like a lectureship. Admittedly, Paul's brother Otto had, in those years, done great service for the TH Darmstadt. It is perhaps the case that the act of conferring the habilitation was an act of gratitude to the Wolfskehl family.

Through his ever-worsening multiple sclerosis Paul Wolfskehl became increasingly and eventually completely paralyzed, so that by 1890 he had to give up his lectures. In the time that followed he did, however, publish a few brief mathematical papers ([31, 32, 33, 34]). Since he was in need of constant care, his family persuaded the bachelor to marry. An oldish spinster, the fifty-three year old daughter of the *Steuerrat*[7] August Frölich, was sought out for him, and he married Susanne Magarethe Marie Frölich on October 12, 1903, in Darmstadt. Fate, however, was not on the side of the long-suffering Paul. His wife, Marie, revealed herself as an evil Xanthippe, who made the last years of his life a living hell. In January 1905 he altered his last will and testament in favor of "whomsoever first succeeds in proving the Great Theorem of Fermat." For the correct solution of the prize task he laid down the sum of 100,000 marks and decided that the Royal Society of Science[8] in Göttingen should hold in trust this money and serve as judge for the awarding of the prize. Paul Wolfskehl died on September 13, 1906. His widow lived, rolling in money, together "with an evil maid and an equally evil Doberman"[9] in the Wolfskehl villa in Darmstadt until her demise on August 18, 1923.

In 1969 Philip J. Davis reported in ([7], pp. 1–6) a strange story about Paul Wolfskehl, which he had learned from the renowned mathematician Alexander Ostrowski. Professor Ostrowski himself, remarks Davis, had heard the story many years before and claimed that there is more to it than mere legend. Since Alexander Ostrowski died in 1986, unfortunately nothing more can be revealed about his source of information. The core of the story reads as follows:

> From Kummer to Wolfskehl is not long in time nor far in distance. As a young student of mathematics, Paul Wolfskehl was attracted to the theory of numbers. The theory is pretty and the methods are difficult. The combination appealed to him. Fermat's Last Theorem was in the air, for the sensation caused by Kummer's near miss had not yet settled down. Wolfskehl tried to prove it. He failed. After all, better mathematicians before him had failed. But it nagged him. He went back to it time and again. He read the works of the masters to see what tools they used and what they were able to accomplish. He made no progress with his own attempts.
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> In the course of this, he formed a romantic attachment to a young lady. He was disappointed there as well. Now that mathematics and romance were both out of the window, he began to feel that life could offer him very little else. He decided to commit suicide. Having made the decision, he went about carrying it out very methodically. He settled his affairs and arranged all important matters. He wrote his will. He fixed upon the method and the very hour of taking his own life. On the last day, he wrote final letters to his friends. Everything was now prepared. A few hours remained till the appointed time. He went into his library, wondering what to do. He took down some mathematical pamphlets from the shelf and fingered them idly.
>
> By pure chance, he opened one of them. It was Kummer's work on Fermat's Last Theorem. As he read the article, he thought he spotted an error in Kummer's work. As a matter of fact, the article begins with a remark that contains a gap in logic. Wolfskehl sat down to check this doubtful point. After all,

[2] *Institute of Technology*

[3] *became qualified as an independent university lecturer*

[4] *initial teacher examination thesis*

[5] *one holding a degree equivalent to a master's in physics*

[6] *"My ancestors and own family"*

[7] *title of a senior tax officer*

[8] *It was renamed Academy of Science in 1919.*

[9] *taken from a letter to the author, from Charlotte Kühner-Wolfskehl, August 1996.*

> Kummer was a man with great reputation, but in the past he had made a very subtle, but crucial, mistake. It was of vital importance to know whether the present argument was correct. One hour passed, two, three hours, while Wolfskehl checked the mathematics. Finally, he was forced to admit that Kummer's argument was completely sound!
>
> When Wolfskehl was through with this job, he reminded himself of his momentous decision to take his own life. But the appointed hour was past. Somehow, he no longer saw the necessity for suicide. From Fermat's Last Theorem had come not only postponement, but a renewed interest in mathematics and a decision to live. He tore up his last letters and his will.

I have since shown the story to members and friends of the Wolfskehl family and people acquainted with their history. Nobody could remember having ever heard of an aborted suicide plan. Several people were of the opinion, however, that such a plan could well have existed. Paul Wolfskehl is reported to have been incredibly depressed at times due to his serious illness and the foreseeable course thereof. Had he had a motive to commit suicide, then it was rather due to this illness than to lovesickness or lack of success in solving the riddle of the Fermat conjecture. It can be taken for granted that the occupation with number theory and specifically with Kummer's papers played an extremely important role in the last years of Paul Wolfskehl's life. The motive for the founding of the prize for proving the Fermat conjecture probably had less to do, as Davis believes, with Wolfskehl's gratitude to the problem that saved his life, than to the fact that number theory, the only true love in his life, had given his last years some meaning. Perhaps the desire not to leave his entire fortune to his loveless wife, Marie, also had a part to play?

On June 27, 1908, the day exactly eighty-nine years prior to the presentation of the prize to Wiles, the conditions for the Wolfskehl Prize endowment were laid down by the Göttingen Royal Society of Science. These were published in several journals, for instance in the *Jahresbericht der DMV* 17 (1908), 111–113 (with commentary by Felix Klein); the *Mathematische Annalen* 66 (1909), 143–144; and the *Acta Mathematica* 31 (1908), at the end of the volume. The prize was, according to the testament, to be valid until September 13, 2007. This date has occasionally led to the assumption that Paul Wolfskehl died on September 13, 1907. This is, however, wrong. The date of his death is, according to official documentation, unequivocally September 13, *1906*. The contents of the publication of June 27, 1908, are available in the abovementioned references and do not need to be repeated here. Only two things are to be emphasized: Wolfskehl explicitly refers to the two most important of Kummer's papers [19, 20] regarding the Fermat conjecture, and he also provides for the case that a counterexample to the Fermat conjecture is found. In the case of a counterexample, an acceptable solution must provide a necessary and sufficient criterion for those exponents λ for which the Fermat equation is insoluble in natural numbers. The opinion which can occasionally be read, that if a counterexample were found the prize would then become invalid, is therefore erroneous.

Wiles beside the Fermat Memorial in Beaumont-de-Lomagne, October 28, 1995.

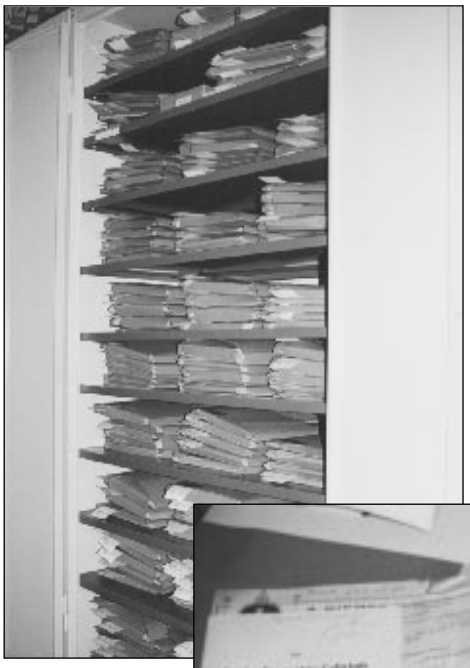
There is no shortage of accurate reports and anecdotes regarding the deluge of supposed proofs of Fermat's Last Theorem which have been handed in and are still being handed in to the Göttingen Academy since the publication of the prize conditions. In the first year alone, 621 supposed solutions were sent to the Academy. For many years now, however, the statistics have no longer been kept on file, although the *Sekretar*[10] of the Academy, the physicochemist Heinz Georg Wagner, estimates the total to be "over 5,000". If the paper received fulfills the formal criteria of the prize conditions, it is then archived in a filing cabinet at the Academy. First, however, it is handed over to the Institute of Mathematics at Göttingen University to be examined, where either one or two *Wissenschaftliche Assistenten*[11] read it, remark upon the mistakes, and reply to the author. Even today roughly four papers arrive per month. An impressive description of his related activity is given by F. Schlichting in a letter dated March 23, 1974, which Paulo Ribenboim quoted in ([26] pp. 15–16).

Only Schlichting's information that the prize was at that time "worth a little bit more than 10,000 DM" is without doubt false. It could have amounted

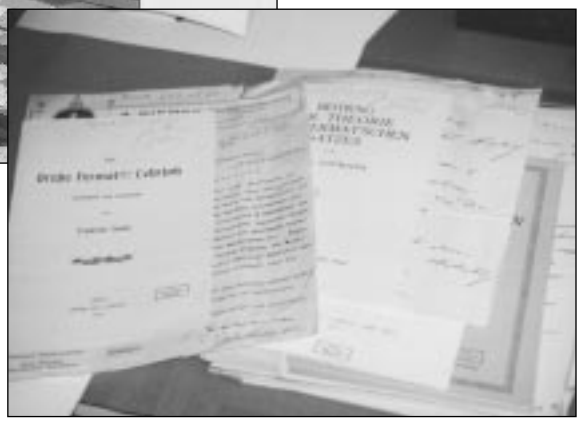
[10] *traditional title of the managing director*

[11] *graduate students/assistant professors*

The Fermat filing cabinet of the Göttingen Academy.



to some 27,000 DM. The reason behind Schlichting's incorrect estimation lies in the (understandable) secrecy of the Göttingen Academy, the consequence of which was that other authors also made incorrect claims regarding the sum. It starts with Eric Temple Bell, who is notorious for his books, which are brilliantly written yet at loggerheads with the facts. As early as 1937 in *Men of Mathematics* [2] he



Some typical pamphlets from the filing cabinet from 1912.

claims that the inflation after the First World War had caused the Wolfskehl Prize to melt away into a fraction of a pfennig. This sad tale was told again and again. Even Derrick Henry Lehmer wrote in 1961 in the "aftermath" of [3]: "The prize money was never awarded and disappeared in inflation." In the same vein, Davis reports in 1969 ([7], p. 6): "A disastrous inflation swept away all value to the prize." Therefore it is no surprise that Dudley assures us in 1978 ([9], p. 136): "Even though there is no longer a prize for the solution, mathematical amateurs still attempt proofs." Even in the revised version of his number theory textbook of 1988, David M. Burton informs his readers ([6], p. 254) that "… the German inflation of the 1920s wiped out the monetary value of the prize." Following the appearance of Ribenboim's book [26] in 1979, word spread slowly of Schlichting's estimation, and in 1990 Davis "knowingly" reports ([8], p. 199): "… the current prize being fixed at just over 10,000 deutschmarks." In 1993 Dudley had also noticed something, namely ([10], p. 109): "The prize is now worth only $10,000 or so, but word of that has not gotten around." The exchange rate of the U.S. dollar against the German mark was at that time rather weak. According to my observations the first realistic sum appeared in Uwe Jannsen's paper ([18], p. 12): The "Wolfskehl prize", donated by the "Göttinger Professor Wolfskehl" (ibid, p. 9) "will then, due to interest and compound interest, amount to DM 70,000". This, indeed would have been the correct sum in 1995. Since the terms of the prize stipulate that a period of two years must pass between the appearance of a proof in print and the awarding of the prize, to allow experts time to review the proof, the prize could have been awarded in 1995 at the earliest, if Wiles's proof, announced on the 23rd of June 1993, had been correct and had appeared in print in 1993. But, as is well known, the proof contained a gap, which was filled in September 1994 by Taylor and Wiles. The proof was published in May 1995. Finally, in September 1995, when it was as good as certain that the published proof was correct, the Göttingen Academy of Science announced in a press release ([1], p. 2), "that the sum of roughly DM 70,000 could, after all, be awarded." By the time the Wolfskehl Prize was conferred on Wiles on June 27, 1997, the prize money had increased to DM 75,000.

In 1906 the Wolfskehl Prize amounted to 100,000 (gold-)marks, which at that time could have been exchanged for 35.8423 kg of gold. This would today have a worth of approximately DM 600,000. The relative value of gold before the First World War, however, was, in comparison with other goods, some five times higher than today. That is to say, the prize would have had a purchasing power of about $1,700,000 today. In terms of the then average income, this was much more than a master craftsman could expect to earn in his entire life. The money was laid down in "safe" securities in accordance with Wolfskehl's will. After the hyperinflation in the Weimar Republic at the beginning of the 1920s, the Reichsmark (RM) was introduced to Germany in 1924 and the remaining value of the Wolfskehl shares set at RM 20,000. Through interest and compound interest the value of the prize rose to RM 75,000 in 1948. This represents an annual interest rate of approximately 5%. With the introduction of the Deutsche Mark (DM) in the currency reform of 1948, the Wolfskehl Prize was devalued by a ratio of 10:1 to DM 7,500. An approximate annual interest rate of 5% meant that the sum of the prize money had increased tenfold in the previous forty-nine years. This is little in comparison with $1,700,000, but a great deal when one considers the common notion that the prize money had vanished. Out of the numerous prizes which Andrew Wiles has received, only the Wolf Prize, sponsored by the Wolf Foundation and presented by Israel's president Ezer Weizman, has offered a higher reward. Compared with the National Academy of Sciences Award ($5,000) or the

AMS Cole Prize in algebra ($4,000), the sum of DM 75,000 is still a nice little earner!

Many derogatory remarks have been written concerning the significance of the Wolfskehl Prize for the development of the Fermat problem specifically and of mathematics generally. It is considered good form for a mathematician who conforms with the perceived image of his profession to emphasize that the prize has done more harm than good to mathematics. On this theme, Oystein Ore's comment of 1948 is typical ([24], p. 207): "The prize probably added little or nothing to the interest of the mathematicians in the problem, but an immediate consequence was a deluge of alleged proofs by laymen eager to gain money and glory. The interest of the dilettanti in the problem has since never quite ceased, and Fermat's problem has without question the distinction of being the mathematical problem for which the greatest number of incorrect proofs have been published." Burton (ibid) and Eves ([11], p. 120) use almost exactly the same formulations. Dudley even brought himself to make the following remark ([10], p. 109): "The main result of Dr. Wolfskehl's prize has been to add to the total of human unhappiness, which is not what he intended."

Admittedly, for the Göttingen Academy of Science the endless flow of incorrect proofs of the Fermat problem was something of a burden, and the Wissenschaftliche Assistenten of the Göttingen University Institute of Mathematics, who on average had one "solution" to analyze per week, had an unenviable task, since many submissions evolved into a brisk correspondence. According to an oral communication from the persons currently concerned with this matter, the record-holding "Fermatist" has to date submitted more than sixty letters to the Göttingen mathematicians. Since the Fermatists like to distribute their "solutions" widely, there is scarcely a single number theorist who, during his lifetime, has not set eyes on a dozen or more pamphlets of this kind. Even in the case of the young Kassel University approximately one "solution" per year is sent in, which then lands on my desk, normally with pretty stamps from China or Kazakhstan.

The Royal Society of Science in Berlin was also especially hard hit after 1908, since numerous Fermatists sent their papers there. The aforementioned Albert Fleck is to be praised highly here for taking on the Herculean labor of examining the articles. Kurt-Reinhard Biermann reports ([4], p. 26): "Not only Göttingen was overwhelmed with 'proofs'. Also in Berlin the mathematical institutions received hundreds of manuscripts on the Fermat problem. There it was Albert Fleck who took it upon himself to look after the works. To every sender he highlighted briefly yet concisely their mistake. He informed the experts about this in *Archiv für Mathematik* and the public about it pictorially under the title 'Die Jagd nach dem Wolfskehlschen Preise'[12] in the Sunday supplement of the *Vossische Zeitung* of the 1st of June 1913, in which he also, incidentally, disproved Eugen Dühring's claim of being in possession of the proof." It is also seldom mentioned that it was Dr. Fleck who discovered the fatal error in a well-known and highly regarded mathematician's supposed proof of the Great Fermat Theorem. Carl Louis Ferdinand von Lindemann (1852–1939), who became famous through his 1882 proof of the transcendence of π, which Carathéodory characterized as "a highlight amongst the mathematical achievements of modern times," had, as early as 1901, published a flawed proof of the Fermat con-

Andrew Wiles and Rudolph Smend (president of the Göttingen Academy) during the Wolfskehl Prize press conference, Göttingen, June 27, 1997.

Nada and Andrew Wiles in the "Ratskeller", Town Hall, Göttingen, June 27, 1997.

[12] '*The hunt for the Wolfskehl prize*'

Andrew Wiles during the press conference in the meeting room of the Academy, Göttingen, June 27,1997.

jecture [21], which he shortly afterwards withdrew [22]. In 1908 another sixty-six page treatise [23] by Lindemann appeared, in which he newly claimed to have proven the Great Fermat Theorem. Albert Fleck showed him a harsh error on pages 23–24 of his paper, which made everything that followed worthless, as well as a number of less significant inaccuracies [12]. "Here lies a grossly false conclusion which renders the otherwise extremely astute method inapplicable," writes Fleck. He adds at the close of his criticism, with apparent regret: "In this way, unfortunately, even this laborious work has, in none of its parts, led to an effective furthering of the problem."

Dr. Fleck was indeed an amateur,[13] but in no way a dilettante, and I can only agree with the much reviled Marilyn vos Savant when she writes ([27], p. 27): "… I feel that no 'amateur' who ever worked on F.L.T. should be called a crank for that reason alone." I trust myself to add: The ten-year-old boy who visited the Milton Road Lending Library in the north of Cambridge in 1963, and borrowed a book titled *The Last Problem* [3], the boy who "devoured" this book and decided to become a mathematician in order to solve the "Last Problem" described in the book was also an amateur. The fact that he also studied Kummer's papers during his school years is quite a different matter. Underwood Dudley is of the opinion that "The theorem might never have attracted the attention of amateurs." Had Dudley been right, the Wolfskehl Prize would probably never have been presented by September 13, 2007.

The three Academy members from Berlin and *Ordinarien*[14] of mathematics—Frobenius, Schottky, and Schwarz—proposed Albert Fleck for the "Silberne Leibniz-Medaille" on January 14, 1914, with which he was presented the following year on "Leibniz Day", July 1, 1915. The laudation, composed by Frobenius, reads [4]: "As an active member of the Berlin Mathematical Society he published an entire series of smaller papers on various number theory problems. In most detail, however, he studied the elementary theory of the Fermat equation and rendered outstanding services through the revelation of the mistakes in countless papers in which laymen had undertaken to prove the Great Fermat Theorem since the founding of the Wolfskehl prize. Through the mastery which this doctor had made his own by diagnosing these unfortunately incurably ill papers, his name became well known to all arithmeticians." Dr. Fleck's "one-man operation" was named the "Fermat Clinic" in mathematical circles in Berlin. "It consisted of Dr. Fleck and his desk; in the clinic, a kind of psychotherapeutic distant treatment was undertaken" [4].

In fact, none of the papers which are kept in the filing cabinet of the archives of the Göttingen Academy have contributed in the slightest to furthering the solution of the Fermat conjecture. For a psychiatrist interested in mathematics, however, they must represent a fascinating wealth of investigation material. Even for the history of elementary mathematics and its advancement in the schools of the world, these entries could be of interest, since they offer a glimpse into the mathematical knowledge of well-educated mathematical laymen from practically every country across the globe over a time span of ninety years. They also offer us an impression of the degree to which the Fermat conjecture is known. For instance, after the conclusion of the East-West conflict and the fall of the Iron Curtain, the number of papers sent in from the countries of the former Eastern Block, whose citizens previously had not been allowed any correspondence with the West, increased sharply. In total they demonstrate impressively how far the tidings of Fermat's Last Theorem penetrated even the most distant corners of the earth.

Without the huge degree of awareness of this open mathematical problem in countless educated mathematical laymen, the enormous world wide resonance of Andrew Wiles's success would be unthinkable. As emphatic a free advertisement for mathematics as this is hardly imaginable. We live in a world where public interest in basic research and the willingness of politicians to finance it is increasingly weak, a world in which the senior writer of *Scientific American*, John Horgan, proclaims not only "The End of Science" [17] but also "The Death of Proof" [16] and banishes the proof of the Fermat conjecture to outlandishness, calling it a "splendid anachronism". In such a world we mathematicians ought to be thankful for the public appreciation that has come about not insignificantly due to the Wolfskehl Prize.

In this context one should consider that the "mathematical cranks" in the midst of the Fermatists who have been made into a target by Dudley, amongst others, represent only the tip of the ice-

[13] *i.e., mathematics was not his profession*

[14] *full professors*

berg. The proportion of those attempting to find a proof for the Great Theorem of Fermat who recognized—without professional instruction—that they would not succeed in this is many times larger than the proportion of those who are unable or unwilling to recognize their failure. Everyone who has attempted it, however, carries the insight that there are ancient problems in mathematics that a child can understand but whose solution goes further than the ability of even the leading experts, and it is precisely therein that lies the Fermat problem's charm, which also overwhelmed ten-year-old Andrew. I accept that one does not need to share my opinion. One can look at the whole thing as Dudley did ([10], p. 109): "The reason FLT is so popular is the dratted Wolfskehl Prize." One can, however, also look at it as Alf van der Poorten did ([25], p. 193): "It's the romance, and size, of this prize that gave the FLT its popularity and notoriety."

In his essay [4] on Albert Fleck, Biermann reports: "*Sanitätsrat*[15] Dr. Albert Fleck died on the 11th of April 1943 in Berlin after he had had to suffer persecution and humiliation in the last ten years of his life." It was this sentence that caused me to look more closely into the history of the Wolfskehl family and their destiny in the Third Reich.

The Wolfskehl family is one of the oldest Jewish families of the Rhein-Main region and is of Levite origin. They originate from the Calonymus family, who can be traced back to the year 870 A.D. At that time Moses ben Calonymus the Old was living in Lucca in Italy. It was with him that the tradition of the Talmud and the Kabbala was planted in European soil. One of his descendents was Calonymus ben Mashulam. He, being a great scholar like his ancestor, was the personal physician to Kaiser Otto II. Then, in 980 A.D., while Otto II was residing in Ravenna, Calonymus became the witness of the celebrated dispute between the most important scholars of that time: namely, Othrich, the head master of the *Magdeburger Domschule*,[16] and Gerbert of Aurillac. The dispute was about the ranking of the sciences, namely, whether more reality and perfection should be ascribed to mathematics or to physics. Gerbert was the advocate of mathematics. In the battle against the Saracens, in Cap Colonne south of Cotrone near Tarent, on July 13, 982 A.D., during which Otto's troops were ambushed and crushingly defeated, Calonymus ben Mashulam saved the emperor's life by leading him along secret passages to the sea, where a Greek ship took him on board. In grateful recognition thereof, Otto II took Calonymus to Germany and settled him in Mainz, where his gravestone remains today. The name Calonymus was later Germanized into Callmann. It is from this Mainz family that the Wolfskehl family originates.

The first traceable Wolfskehl was the cattle dealer Jehuda Löb from the village Wolfskehlen in the *Hessische Ried*,[17] which today belongs to Riedstadt. After the Thirty Year War he immigrated to Darmstadt. His son, Moses Wolfskehl, like his grandson of the same name, was a butcher. Moses's son, Pinchas Wolfskehl (died 1783), was a tradesman in Darmstadt; Pinchas's son, Heyum Wolfskehl, was born in 1776. Heyum Wolfskehl did a salesman's apprenticeship in Paris and fled from there and from the French Revolution in 1792. Before the turn of the century he founded the *Bankhaus Heyum Wolfskehl und Söhne*,[18] which existed until 1881. Heyum Wolfskehl (died 1866) also became court banker to the Grand Dukes Ludwig I and Ludwig III from Hessen-Darmstadt and with this entered the circle of the *Hofjuden*,[19] those financial experts who above all, in the time of Absolutism and in particular in the German princely courts, contributed decisively to the development of the modern system of public finances. Several hoarded great fortunes through high provisions, taxes, fines for late payment, and securities. Heyum Wolfskehl was one of them.

In 1798 Heyum married Karoline Braunfels from Frankfurt, whose nephew was the solicitor Ludwig Braunfels, who also became well known as a poet and one of the founders of the *Frankfurter Zeitung*. Heyum's son, Joseph Carl Theodor Wolfskehl (1814–1863), likewise became a banker and played a significant role in the economic life of the town of Darmstadt. In 1839 he married, "as befitted his social status", Johanna, the daughter of the Stuttgart Hofjude and banker Nathan Wolf Kaulla. Their son, Wilhelm Otto Wolfskehl (1841–1907), the elder brother of Paul Friedrich Wolfskehl, studied law in Heidelberg and Paris. After the premature death of his father, however, Otto had to enter into the banking house of his grandfather. He wed in 1868 Paula Simon, the daughter of the former Hanover Hofjude Israel Simon, who in 1866, when Hanover had become Prussian, moved to Vienna and rebuilt his banking house there. When Paula died from tuberculosis in 1876, Otto Wolfskehl married Lilli Schulz, a pianist and chamber music virtuoso and the daughter of a Hessian colonel.

Otto Wolfskehl was a banker, politician, and friend of the arts. As a long-term member of the Hessian state parliament (1884–1897) and town councillor in Darmstadt (1875–1907) as well as financial advisor to the Grand Duke Ernst Ludwig, he was active in numerous honorary positions for his hometown and did a lot of good through charitable acts and donations. Perhaps his most sig-

[15] *honorary title for a medical doctor of outstanding merit*

[16] *Magdeburg Cathedral School*

[17] *reedy marsh region of Hesse*

[18] *Banking House Heyum Wolfskehl and Sons*

[19] *Jewish banker of the court*

nificant achievement for Darmstadt, however, was the rescuing in 1875–1876 of the Technical College in Darmstadt, which was threatened with closure (or relocation to Giessen) and its subsequent conversion into a Technische Hochschule in 1877. Its generous extension in the 1890s was also essentially his doing. In this context it is also worth considering the information that Paul Wolfskehl received his habilitation in Darmstadt in 1887. It seems to me, considering the fact that a habilitation thesis is not known to exist, more plausible to assume that it was a show of gratitude to the Wolfskehl family that the already seriously ill brother of the great patron of the university was given a chance to lecture for a few more years in his favorite field of number theory at the Technische Hochschule. An in-depth portrait of the great Jewish patriot Otto Wolfskehl is given by Eckhart G. Franz in [13], pp. 240–244.

Three children came from Otto Wolfskehl's marriage to Paula Simon: Karl Joseph (1869–1948), Margarethe Stephanie (1871–1904), and Eduard Wolfskehl (1874–1943). The most well-known (with an entry in every encyclopedia) Wolfskehl of all is Karl Wolfskehl. He was a journalist, lyricist, and Germanist and belonged to the circle of poets around Stephan George, to whom he was the most faithful adherent. Karl Wolfskehl lived and worked initially in Munich, fled in 1933 first to Switzerland and Italy and then, in 1938, to Bayswater near Auckland in New Zealand, where he died in poverty and homesickness. The most comprehensive documentation on Karl Wolfskehl is to be found in the anthology [28] which appeared on the occasion of his one-hundredth birthday. Manfred Schlösser's essay in *Juden als Darmstädter Bürger* ([13], pp. 252–258) offers a good overview.

Karl's brother Eduard was a civil engineer and from 1898 *Regierungsbauführer*[20] and from 1903 *Regierungsbaumeister*[21] of the Railway Administration in Mainz. Under his leadership the Darmstadt main train station was constructed and brought into service in 1914. After this he left the civil service. During the First World War he was a leading member of the Hessian Red Cross. Eduard Wolfskehl lost his life in the Frankfurt-Heddernheim concentration camp in 1943.

The documentary volume [13] includes the widely branching genealogical table of the Wolfskehl family of Darmstadt. All other Jewish members of this family who had not emigrated by 1939 were killed in concentration camps: five in Auschwitz, two in Piaski, and one each in Minsk, Riga, and Theresienstadt. In Darmstadt the only reminders of the great Jewish patriots and benefactors Wolfskehl are a street, Wolfskehlstrasse, and a public park laid out by the family itself, the Wolfskehlsche Garten.

The appalling crimes against the descendants of this family, in my mind's eye, puts the prize, endowed by the unfortunate Paul Wolfskehl, in a different light. As early as the end of the nineteenth century these future events had already announced themselves, even in Hessen-Darmstadt. Due to constant anti-Semitic attacks against his person, Paul's brother gave up not only his position as vice-president but even his seat in the state parliament. Persecution and humiliation of the extent that the Jewish doctor Albert Fleck had to endure were at least spared Paul Wolfskehl as a result of his untimely death. "If one day the Fermat problem is finally resolved," wrote Kurt-R. Biermann in 1987, "and one writes the history of its overcoming, the name Albert Fleck cannot be left out." One may well add: and neither the name Paul Wolfskehl.

[20] *title of a government-appointed clerk of building development*

[21] *title of government-appointed master builder*

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