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Then & Now

Felix Klein and David Hilbert Prevented a Göttingen Appointment of Johannes Stark

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ABSTRACT

Over the course of an extended process, a generational transition took place in Göttingen physics in the years 1914–1920, as the result of which the two chairs of physics held by Woldemar Voigt and Eduard Riecke were eventually replaced by Max Born and James Franck. As part of this process, the Göttingen mathematicians, led by Felix Klein and David Hilbert, prevented Johannes Stark, a Göttingen-trained experimental physicist, from succeeding Riecke. Stark applied for the position himself with the Prussian Ministry of Culture. A particularly revealing letter dated July 1, 1915—presented here in full and contextualized—reveals his egocentric character, his dismissive attitude toward physicists who conducted mathematics-based research, and his anti-Semitic views even at that early stage.

Johannes Stark (1874–1957) was a skillful experimental physicist, who made a name for himself in 1905 by the discovery of the Doppler effect in canal rays [1]. Today he is perhaps best known in experimental physics for the effect named after him: the splitting of spectral lines in an electric field, discovered in 1913, a crucial experiment in the history of the early quantum theory [2, 3]. In 1919, he was awarded the Nobel Prize in Physics for the discovery of these two effects. Equally important, Stark later became also known as an ardent Nazi and one of the most prominent advocates of a so-called German Physics [4].

Stark earned his doctorate in 1897 at the University of Munich under the experimental physicist Eugen von Lommel (1837–1899), a brother-in-law of the mathematician Felix Klein (1849–1925). He then spent a few years in Göttingen, where he completed his habilitation in 1903 under Eduard Riecke (1845–1915), who held the Chair of Experimental Physics at the University of Göttingen. Riecke had also earned his habilitation in physics and mathematics in Göttingen in 1871, under the supervision of the mathematician Alfred Clebsch (1833–1872). As a young *Privatdozent*, Riecke had maintained a discussion group with Clebsch and the fellow *Privatdozent* Felix Klein [5]. In 1881, he became the successor to Wilhelm Weber (1804–1891). As a full professor of physics, Riecke had successfully advocated for Klein's return to Göttingen as a full professor of mathematics effective April 1, 1886, where the two once again collaborated closely. They maintained a collegial relationship for many years, and Riecke delivered a eulogy for Klein as late as May 25, 1913 [6]. He resigned from his post in October 1914, and died on June 11, 1915.

Riecke's resignation from his post in October 1914 prompted a search for a successor. An analysis of the following appointment procedures [7, 8] based on Göttingen archives [9] showed that a first list submitted to the ministry already on December 24, 1914, listed Wilhelm Wien (1864–1928), winner of the 1911 Nobel Prize in Physics, *primo loco*. Friedrich Paschen (1865–1947) was listed *secundo loco*. He was a full professor at the University of Tübingen since 1901, who had achieved significant results,

Abbreviations: [UBG], Niedersächsische Staats- und Universitätsbibliothek Göttingen, Handschriften-abteilung, Cod. Ms. F. Klein.; [ZStA], Records of Zentrales Staatsarchiv Merseburg, integrated into the Staatsarchiv Preußischer Kulturbesitz, Berlin, Dahlem..

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including the recent discovery of the so-called Paschen–Back effect, the splitting of spectral lines in very strong magnetic fields [10]. On the third place, the list had both Pieter Zeemann (1865–1943) and Johannes Stark. In the justifications, the faculty noted that despite their strong scientific accomplishments both Zeeman and Stark were only included to complete the list with the understanding that neither of them were to be appointed if the first two candidates could not be secured. In the case of the Dutch national Zeemann the reasons were presumably reservations against the appointment of a foreigner. In Stark's case, he was explicitly credited with "brilliant experimental talent" ("geniale experimentelle Begabung") and "tireless diligence," ("unermüdliche Arbeitskraft") but because of his "very individual character" ("eigenwilligen Persönlichkeit") the faculty expressed doubts that he would "harmonize" ("harmonisch einordnen") with the faculty who insisted that "an important part of the strength of our university [. . .] lies in the united cooperation of all of its members." [11]

Wien soon declined, but neither was Paschen appointed to a position in Göttingen because he had made excessive demands, as Peter Debye (1884–1966)—then director of the Mathematical-Physical Seminar at the University of Göttingen, which was the relevant Seminar in the Philosophical Faculty for this appointment—informed the ministry [12]. The Dutchman Debye had been in Göttingen since 1913; after declining an appointment in 1914 (Zurich), he held a professorship, financed from various sources, among them from the aging Woldemar Voigt, whom he already replaced to some extent. Debye also succeeded Riecke as an editor of the *Physikalische Zeitschrift*, beginning with issue 15 (1915). He would win the Nobel Prize in Chemistry in 1936.

When the question of Riecke's succession arose, Stark (since 1909) held a professorship in physics at the Technical University of Aachen. He had already achieved outstanding results and awards in the field of experimental physics, which he himself lists in the letter dated July 1, 1915, to the Ministry, reproduced below. Given his ties to Göttingen, he may have been seen as a natural candidate to succeed his teacher Riecke. At least Stark himself may have felt entitled to the position.

Indeed, on June 18, 1915, Stark sent an initial letter to Otto Naumann (1852–1925), the responsible ministry official in Berlin. Naumann had been with the ministry since 1884, had become Director General of the newly formed Higher Education Department in 1907 and was appointed "Privy Councilor with the title of Excellence" in 1913. He held this position until 1920 [13].

In response to Stark's letter, Naumann invited him to Berlin for a meeting which took place some day in the second half of June 1915. There, Stark presumably learned that he was third on the Göttingen appointment list, behind Wien and Paschen. Stark apparently heard nothing in Berlin about Peter Zeeman, who was also ranked third. But Naumann must also have informed Stark that Wilhelm Wien had already declined the position, but that Stark himself would not be offered the chair if Paschen as well chose not to come to Göttingen [14]. Following the conversation in Berlin, Stark sent another letter to Naumann on July 1, 1915, which is reproduced in full and in the original language in the appendix [15].

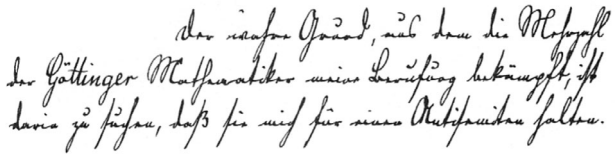


FIGURE 1 | The beginning of the second paragraph of Stark's letter to Otto Naumann, July 1, 1915. [ZStA] Rep. 76 Va Sekt 6 Tit. 4 Nr. 1, Bd. XXIV, Bl. 330.

After thanking Naumann for the kind reception, Stark immediately went in medias res and addressed the issue of his antisemitism; see also Figure 1. He wrote:

> "The true reason why the majority of Göttingen's mathematicians are opposing my appointment is that they consider me an anti-Semite. Now, I know myself to be free of anti-Semitic sentiments and hold every colleague in high regard, both personally and academically, regardless of religious affiliation or ancestry; admittedly, I do oppose one-sided pro-Semitic tendencies in scholarly circles. And the fact that I have stubbornly and successfully opposed lists of candidates consisting exclusively of Semites in two local appointments may have earned me a reputation as an anti-Semite."

Stark's opposition to appointment lists included, among others, the succession of the mathematician Wilhelm Kutta (1867–1944) at the Technical University of Aachen, who had moved to Stuttgart in 1912. Kutta, well known for the Runge–Kutta method in numerical analysis, was a scientific descendant of Felix Klein. The list of candidates to succeed Kutta included Theodore von Kármán (1881–1963), Emil Hilb (1882–1929), and Heinrich Liebmann (1874–1939)—mathematicians from Jewish families. All had maintained close contact with Felix Klein, who had supported Kármán's research on fluid dynamics ("Kármán vortex street"), inspired Hilb to achieve results in the field of automorphic functions, and selected Liebmann as an assistant [16]. As a consequence of Stark's insistence, Georg Hamel (1877–1954) became Kutta's successor in Aachen, while Kármán was appointed to the chair of mechanics there in 1913.—Stark later realized that his behavior regarding appointments had harmed him [17].

Stark went on to refer to another conflict, which he saw as background for the opposition to his application for the Göttingen chair. He continued:

> "The fact that repugnant appointment gossip is indeed the root of the Göttingen mathematicians' hostility toward me is proven to me by the message that Mr. Riecke sent me as early as the summer of 1914; in response to his question to Mr. Klein as to why the mathematicians were so vehemently opposing my candidacy, the latter reportedly explained that it was because I had thwarted Blumenthal's appointment to Giessen."

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The background here is the following. Otto Blumenthal (1876–1944), born into a Jewish family, had earned his doctorate under Hilbert, spent time in Paris (1899–1900), completed his habilitation in Göttingen in 1901, served as acting chair in Marburg, and became a professor at the Technical University of Aachen in October 1905. In December 1912, Blumenthal informed Klein and Hilbert that Stark, with the help of the physicist Walter König (1859–1936) in Giessen, had prevented him from obtaining the prospective mathematics chair as the successor to Eugen Netto (1846–1919). In a letter to Hilbert, he wrote:

> "König, the physicist from Giessen, approached our dear Mr. Stark here, and in his statement, Mr. Stark portrayed the events surrounding Hamel-Kármán's appointment as if I had deliberately included only Jews on the list at the time and, once the questionable nature of my list had been brought to my attention, had behaved in an uncollegial manner. Given the anti-Semitism that was already rampant in Giessen, that was, of course, the end of the road for me." [18]

In reaction to his student Blumenthal's letter, Hilbert obtained a transcript of Stark's letter to König and retained a copy of it. It was indeed an example of outright anti-Semitic smear. Asking to treat his letter confidentially, Stark began his opinion on his colleague Blumenthal like this:

> "Blumenthal was appointed here at Sommerfeld's instigation, against the wishes of Department V (he was third on the list). He is of Jewish descent, and this is likely the reason why, despite his efforts, he has been unable to establish a warm relationship with the majority of his colleagues here. The relationship—while remaining polite—has grown even cooler since it became apparent that he is the focal point of exclusively Jewish aspirations at the local university." [19]

Stark claimed that Blumenthal in Aachen had deliberately supported candidates solely because they came from Jewish families; Blumenthal, in his defenses directed to Klein and Hilbert, denied this [20].

Here, as in the letter to Naumann, Stark vented a clear aversion to Arnold Sommerfeld. The letter to Naumann goes on:

> "Compounding this situation is the fact that I do not belong to the Jewish and pro-Semitic circle of physicists, whose energetic leader is Mr. [Arnold] Sommerfeld. For several years now, a deep despondency has taken hold among young German physicists; they whisper to one another: "To be taken seriously and to get ahead in physics these days, one must be a Jew or a Jew's ally." They view the filling of the important Göttingen chair with anxiety; were a candidate from the Sommerfeld faction or among the Göttingen mathematicians to be appointed to it, a predominantly Jewish school of physics would gain dominance in German physics for decades and, through its influence in the faculties, would distribute the professorships among its members."



FIGURE 2 | The Göttingen Mathematische Gesellschaft in 1902. The society was founded in 1892 by Felix Klein (seated at the table) and Heinrich Weber. David Hilbert is sitting to Klein's right, Otto Blumenthal is standing left in the last row. [UBG] Cod. Ms. K. Schwarzschild 23:1.

It is clear that at that time, Stark's aversion was directed primarily at the circle around Arnold Sommerfeld, another physicist with close ties to Felix Klein. Sommerfeld had earned his doctorate in mathematics under Ferdinand Lindemann (1852–1939)—another student of Klein's—in Königsberg, completed his habilitation under Klein in Göttingen in 1894, and had transitioned from mathematician to physicist through his collaboration on Klein's projects: [21] Professor of Mathematics (Clausthal University, 1897), of Mechanics (Aachen University of Technology, 1900), and of Theoretical Physics (University of Munich, 1906). Sommerfeld mentored more than 50 students, including Nobel laureates such as Hans Bethe, Peter Debye, Werner Heisenberg, Wolfgang Pauli, and others.

After slandering the Göttingen mathematicians (see also Figure 2), Stark in his letter pointed out his own achievements, honors and awards. He mentioned invitations for lectures in the Netherlands and "numerous letters of leading physicists abroad." As an example he quoted from a letter by Henri-Alexandre Deslandres (1853–1948), director of the observatories in Meudon and in Paris, who expressed the expectation that he would be awarded the next Nobel in physics and announced that he would nominate him for the next prize.

Stark also mentioned that his discovery of the Doppler effect in canal rays had been honored by the Vienna Academy of Sciences in 1910 with the Baumgartner Prize. That prize, established by the Academy of Sciences in Vienna for outstanding achievements in physics, was named after Andreas von Baumgartner (1793–1865), who contributed greatly to the popularization of physics as a professor of physics and applied mathematics at the University

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of Vienna (1923–1933), and subsequently in various government offices, factories, the telegraph service, railroad construction, and ministries.

Finally, Stark emphasized that the Faculty of Philosophy at Göttingen awarded him the Vahlbruch Prize for his discovery of the splitting of spectral lines in an electric field. Otto Vahlbruch (died March 28, 1896, in Hamburg) had established a foundation in his will for a prize to be awarded every two years for a work published in German that, during the relevant period, "has brought about the greatest progress in the natural sciences," with the Faculty of Philosophy at the University of Göttingen assuming the honorary role of serving as the jury for awarding the prize [22].

He concluded the list by mentioning that the Göttingen Society of Sciences had unanimously elected him as a corresponding member in 1913.

So far, Stark's intervention on his own behalf to the Prussian ministry. How did the Göttingen mathematicians deal with the matter?

In his letter, Stark mentioned only Felix Klein by name among the Göttingen mathematicians of that time which may seem natural given the longstanding friendship between his teacher Riecke and Klein. Nevertheless, this requires further explanation. Sommerfeld once coined the term "Centralgestirn" for Felix Klein [23]. Indeed, after Klein had declined offers of a professorship from the University of Munich (1892) and Yale University, USA (1896), he had become the leading advisor to the Prussian Ministry of Education on matters concerning appointments in mathematics and physics at Prussian universities and technical colleges [24]. In Göttingen alone, the number of full professorships in mathematics and physics grew from five to ten between 1898 and 1908. This growth was also aided by financial contributions from the Göttingen Association for the Promotion of Applied Physics and Mathematics, founded by Klein in 1898, whose members included the full professors of mathematics, astronomy, physics, and chemistry at Göttingen, as well as approximately 50 financially well-off individuals [25].

Klein had taken emeritus status as of April 1, 1913, for health reasons, and his successor was the Greek mathematician Constantin Carathéodory (1873–1950). Nevertheless, Klein continued to teach and conduct research, retained his seat and vote on the faculty, and still played a dominant role in appointment matters. Also Johannes Stark wrote about Klein's dominance in Göttingen in his autobiographical memoirs [26].

Faculty matters in Göttingen were often discussed and decided on informal hikes which were dominated by the mathematicians. Debye reported the following about the weekly walks established by Klein:

> "Klein was the first to leave the house, and the others joined him in unison: Hilbert (with his dog Pussy), Carl Runge, himself [Debye] with Carathéodory and Prandtl (waiting at the corner), and finally Edmund Landau, who lived on Herzberger Straße. They walked together to the Rohns Inn on the Hainberg, 'and at the Rohns all the faculty business was decided, independent of all the other people in the faculty!' " [27]

Based on Stark's allegations, it should be noted that among the professors who participated in these walks, only one came from a Jewish family: the number theorist Edmund Landau (1877–1938). Carl Runge (1856–1927) and Ludwig Prandtl (1875–1953) had come to Göttingen in October 1904 at Klein's instigation to work in applied mathematics and applied mechanics, respectively. The participants in the Göttingen walks decided on faculty matters, including the succession to Eduard Riecke.

Only a week after Riecke's death, Stark had contacted the Ministry of Culture and had been in Berlin. When he did not immediately receive a response from the ministry to his letter of July 1, 1915, addressed to Otto Naumann, he impatiently sent two more letters there. As early as July 5, he pressed for a response regarding the Göttingen appointment, arguing that his wife's health would otherwise suffer [28]. Stark had been married to Luise Katharina Uebler (1884–1972) since 1905; by 1913, they had two sons and a daughter; twin daughters were born in 1916 [29, 30]. In yet another letter dated July 19, 1915, Stark once again applied for the chair, reiterated Klein's statement regarding his conduct toward Blumenthal, and wrote that he could not accept this as the reason for his non-appointment [31].

In his *memoirs*, Stark mentioned his ambitions for this professorship only briefly when he wrote about a lecture he had given on the discovery of the effect named after him (splitting of electrical lines in an electric field) in 1913 in Göttingen:

> "Professor Runge, who was experienced in spectral analysis, was there, and of course Voigt as well. There was great astonishment. Runge inquired in detail about my experimental conditions and examined my spectrograms at length; finally, he said, "Yes, that's right, everything is in order." Voigt did not say a word, but from then on he was an admirer of mine and even wanted to bring me to Göttingen as Riecke's successor when Riecke died." [32]

Stark here refers to the theoretical physicist Woldemar Voigt (1850–1919). His statements cannot be verified or refuted based on the files reviewed.

Riecke's chair in experimental physics remained vacant for the time being; a request was submitted to the ministry in a letter dated August 23, 1915, and signed by the acting director of the Mathematics and Physics Seminar, Peter Debye [33]. The request was to "appoint Baron Dr. Rausch von Traubenberg, a *Privatdozent* and assistant in the Experimental Department of the Physics Institute, to teach the lectures and seminars in experimental physics for the upcoming winter semester of 1915–16." In support of the request, the directors of the seminar (Voigt, Klein, Hilbert, Runge, Wiechert, Prandtl, Simon, Landau, Hartmann, Carathéodory, Debye) argued that they would have more time for a thorough examination and discussion of the relevant issues associated with the finalizing of a second list of candidates. They argued that the timeframe would allow them to

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invite eligible candidates to deliver public lectures in Göttingen, using funds provided by the Board of Trustees of the Wolfskehl foundation, administered by Privy Council Hilbert.

Heinrich Rausch von Traubenberg (1880–1944), who was to fill the position temporarily, earned his doctorate under Wilhelm Wien in 1905; from 1910, he served as an assistant to the geophysicist Emil Wiechert in Göttingen, and from 1912, as an assistant to Riecke, under whom he completed his habilitation. Traubenberg would become an associate professor in Göttingen in 1918 and was later appointed to additional professorships. His research focused on canal rays, the Stark effect, and nuclear reactions; he was a committed pacifist and opponent of the Nazis [34, 35].

Paul Friedrich Wolfskehl (1856–1906), a physician and mathematician from a Jewish family, donated 100,000 gold marks to the Göttingen Society of Sciences in 1906 for the proof of Fermat's Last Theorem. Hilbert oversaw the review of the proposed proofs; the interest on the funds could be used in advance. Indeed, Hilbert stated in the "Report of the Wolfskehl Foundation Commission 1915/16":

> "At the invitation of the Wolfskehl Foundation Commission, the following gentlemen delivered mathematical and physical lectures over the course of the year: Einstein—Berlin, Sommerfeld—Munich, Born—Berlin, Pohl—Berlin, Edgar Meyer—Tübingen, Clemens Schaefer—Breslau, Koch—Munich, Fran[c]k (Berlin), [Egon] v. Schweidler (Innsbruck), and Conrad Müller (Hanover) delivered lectures on mathematics and physics throughout the year." [36]

Thus, in 1915–16, nine physicists and one mathematician—Conrad H. Müller (1878–1953)—were invited to Göttingen to give lectures; Sommerfeld and Albert Einstein (1879–1955) had already delivered their lectures in June 1915, prior to the submission of the request for extension to the ministry on August 23, 1915.

Before the Göttingen faculty sent a new list of candidates for the Riecke Chair to the ministry, statements from other full professors were received in Berlin. On December 4, 1915, Wilhelm Wien stated that he was "opposed to younger scholars such as [James] Franck, [Robert] Pohl, and Edgar Meyer" and that "Stark was the most suitable, but impossible for personal reasons". Philipp Lenard (1862–1947), winner of the 1905 Nobel Prize in Physics, spoke in favor of Stark on December 10, 1915 [37]. Hilbert, who was himself being considered at the time for an appointment in Berlin [38], weighed in with the remark:

> "My objections to Stark-Aachen pertain solely to the Göttingen position; however, I still strongly prefer the appointment of any other physicist other than Stark—even one who is not on our list." [39]

Gustav Tammann (1861–1938), who had been a full professor of inorganic and physical chemistry in Göttingen since 1908, continued to advocate for Stark from the perspective of an experimental researcher in a letter dated January 20, 1916 [40].

At that time, the Mathematical-Physical Seminar had already sent the new proposals to Berlin on December 18, 1915 [41]. The letter stated that they did not intend to appoint Hermann Theodor Simon (1870–1918), Wilhelm Wien, nor Jonathan Zenneck (1871–1959). Simon, a professor of applied electricity in Göttingen, had originally harboured his own ambitions for the Riecke Chair and had therefore been particularly opposed to Zeeman [42]; when Simon died in 1918, Max Reich (1874–1941) succeeded him.

In contrast, younger physicists were on the list:

1. Edgar Meyer (1879–1960), who had been an associate professor at the University of Tübingen since 1912 but declined the offer and accepted a position as full professor of experimental physics at the University of Zurich in 1916;
2. Robert Pohl (1884–1976), who was at that time still a *Privatdozent* at the University of Berlin [43]; and
3. Peter Paul Koch (1879–1945), a student of Wilhelm Röntgen (1845–1923), who had been an associate professor in Munich since 1913. In 1919, Koch was appointed full professor of experimental physics at the newly founded University of Hamburg. Koch, like Lenard and Stark, became an active Nazi; he would commit suicide on October 1, 1945.

From a letter dated January 29, 1916, which Klein and Hilbert (in Felix Klein's handwriting) sent confidentially to Otto Naumann, the subsequent course of events as well as the dominant influence of Klein (along with Hilbert) can be discerned:

> "Prof. Debye has informed us by telephone that Edgar Meyer has declined the appointment at the University of Göttingen; we assume that you now wish to move toward the other option, namely, to entrust Debye with the directorship of the entire institute and to appoint Dr. Pohl as an associate professor alongside him, whereby it would be left to personal negotiations to determine how the line of demarcation between Debye and Pohl regarding the representation of experimental physics is to be drawn. Debye would then, in any case, likely take over Riecke's tenured professorship, a point to which we attach the greatest importance, since we would like to see Debye—whose continued presence here, given the highly provisional nature of his position to date, we do not yet consider entirely secure—firmly integrated into our university in every way.
>
> Motivated by the same desire, we also take the liberty of providing some information here regarding Debye's current financial situation. [...]
>
> Please regard this confidential presentation merely as an expression of the extraordinary interest we have in reaching a favorable resolution of this matter.
>
> With the highest regards

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Yours most sincerely,

Klein. Hilbert" [44]

Klein wrote that in 1914 Debye had turned down an offer to move to Zurich, where he had been promised 25 000 Fr. = 20 000 M. Since the ministry official Ludwig Elster (1856–1935) had been able to secure only 12 000 M for Debye from the state budget, a special arrangement had been made in Göttingen to retain Debye: The theoretical physicist Woldemar Voigt waived a portion of his salary (= 2000 M); in addition, Debye was paid 2000 M annually from the interest on the Wolfskehl Fund. Klein and Hilbert expressed the expectation that the state budget would now cover these 4000 M.

Naumann followed the recommendations set forth in the letter and the matter was quickly resolved at the ministry. Under Debye (in Riecke's chair), the Berlin private lecturer Robert Pohl was appointed associate professor; he enthusiastically accepted the position and laid the foundations for solid-state physics in Göttingen [45].

On February 23, 1916, Robert Pohl and Otto Naumann signed an agreement appointing Pohl, effective April 1, 1916, as an associate professor of experimental physics and director of the Department of Experimental Physics at the Physics Institute, with an annual salary of 2600 M plus a housing allowance of 720 M [46]. Pohl was not able to begin his actual work until late 1918, as he still had to perform military service in a technical unit. Pohl became a recognized researcher. After declining a position at the Technical University of Stuttgart, he was appointed to a full professorship in Göttingen in 1920 and became director of the First Institute of Physics. Pohl did not belong to any political party and held views that opposed Nazi policies and the impending war [47, 48].

Naumann was named an honorary member of the Göttingen Association for the Promotion of Applied Physics and Mathematics on the occasion of its 20th anniversary in 1918 [49]. Klein had a good relationship with Naumann; with his help, and the support of Einstein and Hilbert, he was able to initiate Emmy Noether's (1882–1935) habilitation in 1919 [50, 51].

When the theoretical physicist Woldemar Voigt died in 1919 and Debye moved to ETH Zurich in 1920, two full professorships were filled: Max Born (1882–1970) for Theoretical Physics and James Franck (1882–1964) for Experimental Physics (Director of the Second Institute of Physics). Klein was still involved in these developments [52–54]. A new golden age of physics and mathematics followed in Göttingen, which came to a drastic halt in 1933.

Author Contributions

R.T.: writing – review and editing, writing – original draft. T.S.: writing – review and editing.

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Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are openly available in the Archives mentioned in the text.

References

1. J. Stark, "Der Doppler-Effekt bei den Kanalstrahlen und die Spektren der Positiven Atomionen," *Nachrichten von der Gesellschaft der Wissenschaften zu Göttingen, Mathematisch-Physikalische Klasse* n.V. (1905): 459–471.

2. J. Stark, "Beobachtungen über den Effekt des elektrischen Feldes auf Spektrallinien. I. Quereffekt," *Annalen der Physik* 43 (1914): 965–982, https://doi.org/10.1002/andp.19143480702.

3. A. J. Kox, "The Discovery of the Stark Effect and Its Early Theoretical Explanations," *Annalen der Physik (Berlin)* 525, no. 05 (2013): A63–A66, https://doi.org/10.1002/andp.201300725.

4. D. Hoffmann, "Stark, Johannes Nicolaus," *Neue Deutsche Biographie* 25 (2013): 71–72, https://www.deutsche-biographie.de/gnd118798499.html#ndbcontent.

5. R. Tobies, (2021), *Felix Klein: Visions for Mathematics, Applications, and Education*. Revised by the Author and translated by Valentine A. Pakis from the German first ed. 2019 (Vita Mathematica, Vol. 20). Cham: Birkhäuser/Springer Nature Switzerland: 110–113; and Tobies, Renate (2025). *Felix Klein (1849–1925). Visionen für Mathematik, Anwendungen und Unterricht* (2nd redesigned, expanded German edition). Berlin: Springer Spektrum: 110–113, https://link.springer.com/book/10.1007/978-3-662-71214-6.

6. Ref. 5 (Tobies 2021): 611–612; (Tobies 2025): 4–5.

7. R. Tobies, "Zur Berufungspolitik Felix Kleins.—Grundsätzliche Ansichten″ [On Felix Klein's Appointment Policy: Fundamental Views]," *NTM-Schriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin* 24, no. 2 (1987): 43–52.

8. A. Schirrmacher, *Establishing Quantum Physics in Göttingen. David Hilbert, Max Born, and Peter Debye in Context, 1900–1926* (Springer Nature, 2019), https://link.springer.com/book/10.1007/978-3-030-22727-2.

9. H.-J. Dahms, "Appointment Politics and the Rise of Modern Theoretical Physics at Göttingen," in *Göttingen and the Development of the Natural Sciences*, ed. N. Rupke (Wallstein, 1999), 143–157.

10. F. Paschen and E. Back, "Normale und Anomale Zeemaneffekte," Annalen der Physik 39 (1912), pp. 897–932, https://doi.org/10.1002/andp.19123441502; 40 (1913), pp. 960–970.

11. Ref. 9, p. 146.

12. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 315–316. Paschen became president of the Physikalisch-Technische Reichsanstalt (PTR) from 1924 to 1933; when he ended the celebration marking the Nazis' seizure of power on March 8, 1933, at the PTR by taking down the swastika flag, he was replaced by Stark who assumed this office on May 1, 1933.

13. R. Lüdicke, *The Prussian Ministers of Culture and Their Officials in the First Century of the Ministry, 1817–1917* (Stuttgart & Berlin: Cotta, 1918), 31–32.

14. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 325–326.

15. ZStA, Rep. 76 Va, Sect. 6, Tit. 4, No. 1, Vol. XXIV, pp. 330–331 (Stark's letter dated July 1, 1915).

16. Ref. 5 (Tobies 2021): pp. 468, 346, 463; (Tobies 2025): pp. 447; 458; 408.

17. A. Kleinert, ed., *Johannes Stark. Memoirs of a German Natural Scientist* (Mannheim: Bionomica (New edition in preparation), 1987), 41.

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18. D. E. Rowe, *Otto Blumenthal. Selected Letters and Writings*, I (Springer Spektrum, 2018): 148, 1897–1918.

19. Ref. 18, p. 150.

20. Ref. 17, pp. 148–150.

21. See also M. Eckert, *Arnold Sommerfeld: Atomic Physicist and Cultural Ambassador, 1868–1951. A Biography*. (Wallstein, 2013), https://doi.org/10.1007/978-1-4614-7461-6.

22. https://www.zobodat.at/pdf/ZoologischerAnzeiger_54_0304.pdf.

23. Ref. 5 (Tobies 2025): 443.

24. R. Tobies, "Alliance Between Science, the State, and Industry—Friedrich Althoff and Felix Klein," in *Siegener Beiträge zur Geschichte und Philosophie der Mathematik*, ed. R. Krömer and G. Nickel, Vol. 17 (2023): 53–81.

25. Ref.5 (Tobies 2025): 425, 579–581.

26. Ref. 17: 25.

27. Quoted in Ref. 5 (Tobies 2021): 326; (Tobies 2025): 314.

28. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, p. 337 (letter from Stark dated July 5, 1915).

29. Based on Stark's family tree and family grave, as provided by Mr. Kleinert.

30. Ref. 4, pp. 71–72.

31. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 339–340 (Letter from Stark dated July 19, 1915).

32. Ref. 17: 22.

33. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 268–269 (letter dated Aug. 23, 1915).

34. D. Busse, *Engagement oder Rückzug? Göttinger Naturwissenschaften im Ersten Weltkrieg*, (Göttinger Universitätsverlag, 2008): 243–260.

35. M. Born, "Prof. Heinrich Rausch v. Traubenberg," *Nature* 157 (1946): 328, https://doi.org/10.1038/157328a0.

36. Published in *Nachrichten der Königlichen Gesellschaft der Wissenschaften in Göttingen. Geschäftliche Mitteilungen für das Jahr* (Weidmannsche Buchhandlung, 1916), 13.

37. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 341–342 (W. Wien); Bl. 346 (Lenard).

38. T. Sauer, "Hilberts Ruf nach Bern," *Gesnerus* 57 (2000): 182–205, https://doi.org/10.1163/22977953-0570304004.

39. David Hilbert to Otto Naumann, 24 December 1915, quoted in Ref. 8, p. 102.

40. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIVfol. 370–371r (Tammann to Ministerial Director Otto Naumann, Jan. 20, 1916).

41. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 348–355 (letter dated Dec. 18, 1915).

42. Ref. 9: 146.

43. R. W. Pohl, (2013), *Biographical Notes. Memories of the Early Days of Solid-State Physics, Curriculum Vitae, and Political Views*. Compiled and edited by Robert Otto Pohl. Göttingen: GOEDOC, Document and Publication Server of Georg-August University (https://d-nb.info/1035655896/34).

44. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV, pp. 372–373r (letter from Klein and Hilbert, Jan. 29, 1916).

45. Ref. 44.

46. ZStA, Rep. 76 Va Sect. 6 Tit. 4 No. 1, Vol. XXIV,.

47. *Notizen von Robert Wiechert Pohl*. Göttingen: GOEDOC, Dokumenten- und Publikationsserver der Georg-August-Universität, 2013; http://resolver.sub.uni-goettingen.de/purl/?webdoc-3896.

48. F. Ebner, (2013), *James Franck–Robert Wiechert Pohl. Briefwechsel 1906–1964*. München: Deutsches Museum, Preprint 8, pp. 90ff.

49. See Ref. 5 (Tobies 2025): 517.

50. Ref. 5 (Tobies 2025): 530.

51. C. Tollmien, *Wir Bitten Nur um Dispens für den Vorliegenden Einzigartig Vorliegenden Fall"–die Habilitation Emmy Noethers* (Die Lebens- und Familiengeschichte der Mathematikerin Emmy Noether in Einzelaspkten 2). (Hamburg: tredition, 2021).

52. M. Born, "Hilbert und die Physik," *Die Naturwissenschaften* 10 (1922): 88–93, https://doi.org/10.1007/BF01591619.

53. Ref. 7.

54. Ref. 5 (Tobies 2021): 562; (Tobies 2025): 547–548.

55. ZStA, Rep. 76 Va Sekt 6 Tit. 4 Nr. 1, Bd. XXIV, Bl. 330–331 (Brief Starks v. 1.7.1915).

APPENDIX

[1 July 1915]

"Eurer Exzellenz [Otto Naumann]

> Danke ich herzlich für die gütige Entgegennahme meines Besuches und die mir gewährte Auskunft. Bei deren Überdenken sind mir manche Zusammenhänge klar geworden und ich bitte Eure Exzellenz, mir die nachstehenden Hinweise zur Verteidigung gegen die Umtriebe wider meine Berufung gestatten und, falls Herr Paschen ablehnt, sie berücksichtigen und meine Berufung dem Herrn Minister empfehlen zu wollen.

> Der wahre Grund, aus dem die Mehrzahl der Göttinger Mathematiker meine Berufung bekämpft, ist darin zu sehen, daß sie mich für einen Antisemiten halten. Nun weiß ich mich von antisemitischer Gesinnung frei und schätze einen jeden Kollegen persönlich und wissenschaftlich ganz ohne Rücksicht auf Konfession und Abstammung ein; freilich bekämpfe ich einseitig philosemitische Bestrebungen in Gelehrtenkreisen. Und daß ich mich bei zwei hiesigen Berufungen hartnäckig und mit Erfolg gegen ausschließliche semitische Vorschlagslisten gewehrt habe, mag mich in den Ruf eines Antisemiten gebracht haben. Daß in der That widerwärtiger Berufungsklatsch die Wurzel der Feindschaft der Göttinger Mathematiker gegen mich ist, beweist mir die Mitteilung, die mir Herr Riecke bereits im Sommer 1914 zugehen ließ; auf seine an Herrn Klein gerichtete Frage, warum die Mathematiker meine Kandidatur so scharf bekämpften, hätte dieser erklärt, deswegen, weil ich Blumenthals Berufung nach Giessen hintertrieben hätte. Hierzu kommt noch erschwerend, daß ich nicht dem jüdischen und philosemitischen Kreis von Physikern angehöre, dessen rühriger Führer Herr [Arnold] Sommerfeld ist. Seit mehreren Jahren greift unter den jungen deutschen Physikern eine tiefe Niedergeschlagenheit Platz; sie raunen sich das Wort zu: Um heutzutage in der Physik etwas zu gelten und vorwärts zu kom-

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men, muß man Jude oder Judengenosse sein. Mit Angst sehen sie der Besetzung des wichtigen Göttinger Lehrstuhls entgegen; käme auf diesen ein Kandidat der Sommerfeld-Partei oder der Göttinger Mathematiker, so gewönne eine überwiegend jüdische Physik die Herrschaft in der deutschen Physik für Jahrzehnte und würde durch ihren Einfluß in den Fakultäten die Professuren unter ihren Mitgliedern verteilen.

Es ist gewiß kühn von mir, daß ich Eurer Exzellenz derartige Dinge vortrage. Aber ich glaube, es sowohl Eurer Exzellenz wie der deutschen Physik und dem Staatswohl schuldig zu sein, und vielleicht darf ich es auch deswegen wagen, weil ich mir in meiner Wissenschaft eine geachtete Stellung errungen habe. Aus diesem Grunde und gegenüber der unlauteren Agitation gegen mich wollen mir Eure Exzellenz verzeihen, daß ich selbst die Anerkennungen aufzähle, welche meinen Arbeiten zu teil geworden sind, insbesondere im Ausland.

Im Jahre 1907 war ich offizieller Gast auf der holländischen Naturforscherversammlung, um über Arbeiten von mir vorzutragen. Im vorigen Jahre hielt ich auf Einladung vor den philosophischen Fakultäten der Studierenden an den Universitäten Leiden und Utrecht Vorträge. Von führenden Physikern des Auslandes gingen mir zahlreiche Anerkennungsschreiben zu. So schrieb mir der erste französische Physiker und Astronom der Gegenwart Deslandres (Paris) am 23. April 1914: „Votre découverte est l'une des plus importantes des 20 dernières années, et je forme le souhait que, le prochain prix Nobel soit pour vous. En ma qualité de correspondent de la Société royale d'Upsala je suis consulté sur la désignation des prix Nobel, et, si vous ne l'avez pas cette année, je vous proposerai pour l'année prochaine." Meine Entdeckung des Doppler-Effektes an Kanalstrahlen wurde von der Wiener Akad. d. Wiss. im Jahre 1910 durch den Baumgartner-Preis ausgezeichnet. Die philosophische Fakultät Göttingen sprach meiner Entdeckung der elektrischen Zerlegung der Spektrallinien den Vahlbruch-Preis zu, der alle 2 Jahre die bedeutendste naturwissenschaftliche Arbeit krönen soll. Die Göttinger Gesellschaft d. Wiss. wählte mich im Jahre 1913 einstimmig zum korr. Mitglied.

Auf Grund dieser Mitteilungen lege ich die Entscheidung über meine Zukunft vertrauensvoll in die Hände Eurer Exzellenz. In größter Hochachtung

Eurer Exzellenz ergebenster

J. Stark" [55]

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