

2014

**PREPRINT 456**

David E. Rowe and Robert Schulmann

**General Relativity in the Context  
of Weimar Culture**



# General Relativity in the Context of Weimar Culture

David E. Rowe and Robert Schulmann

## Early Networks

Albert Einstein had many personal friends and allies. Together they constituted a fairly large network centered in essentially three places: Berlin, Zürich, and Leiden.<sup>1</sup> His supporters in Berlin included Max Planck and Max von Laue; in Zürich, Heinrich Zangger<sup>2</sup> and Hermann Weyl; and in Leiden, H. A. Lorentz, Paul Ehrenfest, and Willem de Sitter. Important as these three centers were, however, they only offer a partial view of how relativity was received and elaborated during the crucial period from 1914 to 1924.

Particularly within Germany, this picture must be supplemented by developments somewhat outside Einstein's own personal networks. It is also important to notice that Einstein's scientific contacts expanded greatly during this decade of his rising fame. Many pieces of this puzzle can now be found scattered throughout the volumes of the ongoing Einstein edition.<sup>3</sup> So the time is surely ripe for synthetic studies that can exploit this scholarly work and other documentary evidence.

---

<sup>1</sup> Einstein's early academic career began in Zürich, and he was 35 when he came to Berlin in 1914. After the war he made several trips to Leiden, which became an active hub of research activity in general relativity.

<sup>2</sup> As the only member of this group who made no contribution to relativity, the less-familiar Heinrich Zangger nevertheless played a central role in Einstein's scientific career, about which plentiful evidence can be found in (Schulmann 2012). It was Zangger, a prominent Swiss forensic physician, who almost singlehandedly engineered Einstein's appointment to the ETH in 1912 and, but for Einstein's reluctance to leave Berlin, was prepared to win a *Doppelprofessur* for him at the ETH and at the University of Zurich after the First World War.

<sup>3</sup> Cited hereinafter as *CPAE*; the most relevant volumes for the present essay are those beginning with volume 6.

As has long been appreciated, the Göttingen mathematical community, led by David Hilbert and Felix Klein, played a central role in promoting as well as criticizing Einstein's theory of relativity. A full picture would require taking into account earlier work of several key figures, including Hermann Minkowski, Max Born, Emil Wiechert, Karl Schwarzschild, and Arnold Sommerfeld. Historians of physics have largely ignored the reception and development of general relativity, perhaps because it had remarkably little impact on physics as a whole.<sup>4</sup> Hermann Weyl made a similar point in 1949 when he wrote that: "There is hardly any doubt that for physics special relativity theory is of much greater consequence than the general theory. The reverse situation prevails with respect to mathematics: there special relativity theory had comparatively little, general relativity theory very considerable, influence, above all upon the development of a general scheme for differential geometry" (Weyl 1949, 395-396). This much granted, there is still far more to be said about the larger implications of Einstein's revolutionary theory of gravitation.

Lewis Pyenson's studies (Pyenson 1979, 1985) attempted to set off the young Einstein's approach to theoretical physics against the highly mathematical methods employed by leading Göttingen figures, most notably Minkowski and Hilbert. In doing so, Pyenson was largely motivated by a disciplinary approach to modern physics. Such an approach may make good sense for the preceding period, but certainly not for the decade beginning with the Great War. Clearly the Göttingen mathematicians, led by Hilbert, ignored and even scorned the

---

<sup>4</sup> An important exception is (Hentschel 1990), though this focuses mainly on the reception of relativity within the various philosophical schools. More recently, the essays in the massive four-volume study (Renn 2007) deal extensively with the complex genesis of general relativity. See, in particular, (Janssen and Renn 2007).

traditional disciplinary lines that separated mathematics from theoretical physics (Rowe 2003a, 2004b). Weyl was one of those who expressed skepticism when it came to Hilbert's invasion of this foreign terrain. Still, he himself long pursued a similar strategy, even if he was not apt to repeat Hilbert's haughty quip that "physics had become too difficult for the physicists."<sup>5</sup>

Given the centrality of mathematical methods for research bearing on this new approach to gravitation, historians would do well to focus on this cross-fertilization rather than merely wondering when and why Einstein himself came to recognize that the new field physics required higher mathematics. Our goal, however, is not to study this complex interplay of ideas but rather we take this as a historical given. For us, this breakdown of disciplinary boundaries had a larger significance for academic politics in Germany. In particular, this mathematical invasion heightened tensions that had long been brewing within the German physics community. By the same token, Einstein, an outspoken Swiss Jew who only arrived in Berlin a few months before the outbreak of the Great War, was clearly a polarizing figure, politically as well as scientifically.<sup>6</sup>

### **Hilbert's Göttingen**

As for Hilbert's Göttingen, this small world fit into a much larger one: the Göttingen mathematical community was a true Weimar-culture phenomenon in a sense we will describe

---

<sup>5</sup> Weyl's later views are summed up in his obituary for Hilbert (Weyl 1944). For a detailed overview of Hilbert's interest in the foundations of physics, see (Corry 2004). For a critical assessment, see (Sauer 2002).

<sup>6</sup> His political views are set forth in (Rowe and Schulmann 2007).

in the course of this essay. Its community was unusually open, affording young people from a variety of backgrounds opportunities that would have been unthinkable elsewhere. But it was also fiercely competitive with a distinctly Prussian style that suited its leading personalities, Klein, Hilbert, and their colleague Edmund Landau. Weyl once called Hilbert the Pied Piper of Göttingen because of his ability to attract throngs of talented youth, a large share of them outsiders in one way or another (Weyl 1944, 132).<sup>7</sup> Quite a few were of Jewish background, including several from Eastern Europe. A particularly important group of talented Jews came from Breslau in Silesia, most notably Max Born, Otto Toeplitz, Ernst Hellinger, and Richard Courant.

Born was the first of these four Breslau Jews to enter the more intimate private sphere that made the Göttingen of Hilbert and Minkowski so special. But Courant was soon to follow, even though he got off to a rough start in their seminar (Reid 1976, 16). Born later suffered a similar fiasco when he gave his first talk in the *Mathematische Gesellschaft* (Born 1978, 134-135). In fact, this type of harrowing experience was so commonplace that it must have seemed like a kind of initiation rite for the young mathematicians who survived it. Even Emil Artin, who came to Göttingen in 1922 when Courant was director of the Mathematisches Institut, complained bitterly about the abuse he suffered from Hilbert, who of course set the tone.<sup>8</sup> The mathematical atmosphere in Göttingen was, from the time of

---

<sup>7</sup> Weyl's own view of Hilbert was highly ambivalent, for which see (Rowe 2003b).

<sup>8</sup> Artin wrote to his former mentor in Leipzig, Gustav Herglotz, as follows: „I have now given my lecture, but as far as Hilbert is concerned, I was not lucky. Landau and the number theorists liked it very much, as they also expressed, while Hilbert was interrupting me frequently. . . . I could not finish my talk and present the last results of my dissertation . . . Hilbert has spoiled my joy for work completely . . .” quoted in (Frei 2004, 270).

Klein and Hilbert, fiercely competitive. You had to be a survivor. Born later gave this vivid account of a typical scene as a prelude to describing his own disastrous first lecture before this group:

The whole atmosphere of that learned Society was neither pleasant nor encouraging. At a long table parallel to the blackboard were seated the most formidable mathematicians, mathematical physicists and astronomers of Germany: Klein, Hilbert, Landau (Minkowski's successor), Runge Voigt, Wiechert, Prandtl, Schwarzschild, often strengthened by guests, German or European celebrities. The younger members and less important guests were seated at two long tables at right angles to the 'high table'. This younger crowd, if not as famous as the 'Mandarins', was yet no less critical and perhaps more conceited: [Ernst] Zermelo, [Max] Abraham, the Müllers [Hans and Conrad], [Otto] Toeplitz, [Ernst] Hellinger, . . . , and many newcomers: Gustav Herglotz, Alfred Haar, Hermann Weyl, Paul Kőbe, and others. Books were piled on the green cloth of the tables; at the beginning of the meeting Klein gave a short account of his impressions of some of these new publications and then circulated them. So everybody soon had a book in his hand and paid very little attention to the speaker, and what attention he gave was mostly in the way of objection and criticism. There was no friendly listening, nor a vote of thanks at the end. It was extremely difficult to catch the attention of the audience, to create a spell of interest, and scarcely possible to arouse enthusiasm (Born 1978, 134-135).

Hilbert's own personal network was rooted in his native Königsberg, where he developed special friendships with Minkowski and Adolf Hurwitz during his student days there (Reid 1970). Both came from Jewish families and some assumed that David Hilbert was also a Jew, if only because of his name. Later, when so many young Jews began to gravitate to Göttingen, the local atmosphere began to change. What Richard Courant experienced there was something new and exciting. As the historian Peter Gay long ago pointed out, Weimar

culture already took root during the Wilhelmian period (Gay 1968).<sup>9</sup> During his later career at New York University, he thought of himself as a kind of cultural ambassador whose aim was to transplant this Göttingen spirit over to the New World. His home in New Rochelle became the center of an émigré culture outside the city, and this, too, was very much a Weimar-culture phenomenon. Richard Courant was hardly the type of figure Gay had in mind, and yet the subtitle of his book fits him perfectly: “the outsider as insider”.

During the war years, Hilbert’s own work on general relativity helped draw attention to Einstein’s theory. Indeed, his considerable authority and inimitable enthusiasm helped stir up interest years before Einstein became a public figure—his sudden fame came about only after the war when in November 1919 thanks to the confirmation of his theory in the wake of the British eclipse expeditions. Shortly after Einstein visited Göttingen in the summer of 1915, Hilbert wrote to Karl Schwarzschild, who was then stationed on the eastern front. Soon afterward, Arnold Sommerfeld began corresponding regularly with Schwarzschild, whose letters contain the first exact solutions to two special cases of Einstein’s gravitational field equations.<sup>10</sup> These results on static, centrally symmetric gravitational fields were refined and generalized over the next few years by Johannes Droste, Hilbert, Tullio Levi-Civita, and others, culminating in G. D. Birkhoff’s theorem from 1923.<sup>11</sup>

---

<sup>9</sup> It should be noted that Gay and other historians of Weimar culture place it in opposition to the dominant mandarin mentality of the German professoriate. Thus, Walter Laqueur entitles the sixth chapter of his study (Laqueur 1974) “Universities in opposition.”

<sup>10</sup> Published as (Schwarzschild 1916a, 1916b).

<sup>11</sup> These developments are briefly discussed in (Rowe 2004b).

Beyond the more visible Göttingen actors were a number of others who played secondary roles. Three less familiar figures from Hilbert's immediate circle—Emmy Noether, Vsevolod Frederiks, and Jakob Grommer—literally entered this story through the back doors. Presumably all three were present when Einstein lectured in Göttingen in the summer of 1915, and all went on to make important contributions to general relativity in the years immediately afterward. Emmy Noether, who later became famous in Göttingen as the mother of modern algebra, was the daughter of the Erlangen mathematician Max Noether, a close friend of Klein's.<sup>12</sup> She had earlier studied in Göttingen, and returned again just three months prior to Einstein's visit, hoping to become the first woman to habilitate at a Prussian university. Hilbert caused a local scandal in the philosophical faculty when the humanists tried to block her nomination.<sup>13</sup>

Einstein later reacted in a letter to Hilbert as follows: "Gestern erhielt ich von Fr. Nöther eine sehr interessante Arbeit über Invariantenbildung. Es imponiert mir, dass man diese Dinge von so allgemeinem Standpunkt übersehen kann. Es hätte den Göttinger Feldgrauen nichts geschadet, wenn sie zu Frl Nöther in die Schule geschickt worden wären. Sie scheint ihr Handwerk gut zu verstehen!"<sup>14</sup> Although written three years after the events in Göttingen had surrounded Noether's failed attempt to habilitate there, Einstein's *Anspielung* regarding her ability to teach young men who had served in the army makes clear that he was well aware of the nature of that earlier controversy. Hilbert's colleagues had argued that to

---

<sup>12</sup> On Noether's early education and her connections with Erlangen and Göttingen, see (Rowe 1999).

<sup>13</sup> A detailed account of the events surrounding Noether's efforts to habilitate can be found in (Tollmien 1990).

<sup>14</sup> Einstein to Hilbert, 24 May 1918, *CPAE* Vol. 8B, Document 548.

allow a woman to teach former soldiers would be nothing less than a grave insult. After the collapse of the *Kaiserreich*, Einstein offered to intercede on Noether's behalf, though this proved unnecessary.<sup>15</sup> With the new Weimar Ministry of Culture paving the way, she joined the faculty in 1919; still, she never did obtain a professorship in Germany. During the war years, Noether assisted both Hilbert and Klein, who relied heavily on her expertise in differential invariants. She also taught advanced courses that were offered under Hilbert's name. Noether helped to resolve one of the most puzzling and contentious problems in general relativity, namely how to treat energy-momentum conservation.<sup>16</sup>

At this time she was working closely with Klein, then nearly 70 and ailing. His youthful vigor returned, however, after reading papers by Einstein and the Leiden astronomer de Sitter on relativistic cosmology.<sup>17</sup> Klein began corresponding with both authors, and then with Hermann Weyl, leading to a fascinating four-cornered debate.<sup>18</sup> Spurred on by Einstein, Klein struggled with several of general relativity's most demanding problems (Klein 1918b, 1918c). One of these involved Einstein's controversial handling of gravitational energy; another problem, related to this, was how to understand the various forms of energy conservation introduced by Einstein, Hilbert, and Lorentz.<sup>19</sup> Einstein's treatment of gravitational energy caused widespread consternation, whereas Hilbert's approach via an invariant energy vector was so complicated that no ordinary mortal could understand it, as

---

<sup>15</sup> Einstein to Klein, 27 December 1918, *CPAE* Vol. 8B, Document 677.

<sup>16</sup> On the pre-history of the Noether theorems, see (Rowe 1999); their delayed reception and influence are discussed in (Kosmann-Schwarzbach 2004). See further (Kastrup 1987).

<sup>17</sup> On de Sitter's longstanding interest in general relativity, see (Röhle 2007).

<sup>18</sup> This debate is discussed in the editorial note "The Einstein-DeSitter-Weyl-Klein Debate," *CPAE* 8A, 351-357.

<sup>19</sup> See the discussion in (Jannsen and Renn 2007, 909-911).

Klein indicated to Wolfgang Pauli.<sup>20</sup> Klein hoped to find a way to distinguish formally between the conservation laws of classical mechanics and special relativity, on the one hand, and the types of laws that arise in general relativity, on the other.<sup>21</sup> The latter laws pop out as consequences of the field equations for gravitation. Emmy Noether solved this problem in stunning generality in a paper that contains two deep theorems in the calculus of variations which today bear her name (Noether 1918). Only afterward did it become clear that energy-momentum conservation in general relativity could be derived directly from the Bianchi identities, that is without any appeal to variational principles (Rowe 2002).

Vsevolod Frederiks was a Russian who studied physics and mathematics in Göttingen.<sup>22</sup> After the war broke out, he was dismissed from the university and interned as a civilian prisoner of war. But then Hilbert interceded and gave him work connected with his bold attempt to unify gravity, electromagnetism, and matter (Vizgin and Frenkel 2002, 170). Working alongside Emmy Noether in an effort to promote Hilbert's research program, Frederiks became highly versed in differential invariants, variational principles, and the mathematical methods of general relativity. He also assisted Klein in his work on open problems in relativity and cosmology. Shortly before the war ended, Frederiks returned to Russia, where he spearheaded the transmission of general relativity to the Soviet Union. He lectured on Einstein's theory at Petrograd and wrote the first Russian survey of general

---

<sup>20</sup> Klein to Pauli, 8 May 1921, (Hermann/ v. Meyenn/ Weisskopf 1979, 31). In these letters Klein offered Pauli various tips for his report on relativity, published soon thereafter as (Pauli 1921).

<sup>21</sup> Klein entered this arena with (Klein 1918a), in which he noted a simplification in Hilbert's original argument in (Hilbert 1915). For detailed discussion of the latter, see (Sauer 1999).

<sup>22</sup> He had an assistant's position in physics until the war broke out, as documented in UAG.Kur.Alt.4.V.h.35; Bd.1: Besetzung und Verwaltung der Assistentenstellen der Abteilung für Mathematische (bzw. Theoretische) Physik am Physikalischen Institut, Universitätsarchiv Göttingen.

relativity in 1921. Frederiks' lectures also sparked the interest of Alexander Friedmann, and together they taught Einstein's general theory of relativity to the younger generation of Russian physicists, including Vladimir Foch.

Friedmann later visited Germany and corresponded with Einstein regarding the young Russian's pioneering work on dynamic relativistic cosmology. Einstein had published a short rebuttal of this, in which he claimed that non-stationary solutions of the gravitational field equations for isotropic, homogeneous matter distributions cannot exist. In a long letter, Friedmann tried to explain why Einstein's argument was mistaken. Then, in May 1923, Yuri Krutkov spent 11 days together with Einstein and Ehrenfest in Leiden. From Krutkov's private notebook we gain a glimpse of what happened: "On Monday, 7 May 1923, Einstein and I read Friedmann's article. . ." and on May 18: "I won over Einstein in an argument about Friedmann. The honor of Petrograd is saved" (Frenkel 2002, 7). Shortly afterward Einstein published a retraction stating that ". . . the field equations admit, besides the static solution, dynamic (that is, varying with the time coordinate) spherically symmetric solutions for the spatial structure" (Einstein 1923). Unfortunately, Friedmann died of typhoid fever long before the Friedmann models became standard mathematical underpinnings for the cosmology of an expanding universe (about which, see (North 1965) or (Kragh 1999)). As for Vsevelod Frederiks, the man who initiated Russian research on general relativity, he was arrested in 1936 and died seven years later of pneumonia while being transferred from prison.

Then there was Jakob Grommer, an eastern orthodox Jew who had once hoped to become a rabbi in Brest-Litovsk (Pais 1982, 487-488). That dream was shattered by a

horrible illness: Grommer suffered from acromegaly, a disease that leads to enlargement of the bones, face, and jaw. When he arrived in Göttingen in 1912 his hands were massive and his head nearly twice normal size. There his mathematical talents were discovered by Toeplitz who was then Hilbert's post-doctoral assistant. The sight of Grommer caused many people discomfort, but Hilbert was mainly interested in what a head could produce in the way of mathematics. As should now be clear, he had a penchant for attracting exotic talent—and one could not get much more exotic than Grommer, who apart from his physical ailment faced triple jeopardy as a foreigner, orthodox Jew, and as someone without the equivalent of the *Abitur*, since he graduated from a Talmudic school rather than a traditional Gymnasium. Hilbert's efforts to help him obtain his doctorate met with formidable resistance, even from his colleague, the number-theorist Landau, who initially argued against admitting Grommer to stand for his final doctoral exam.<sup>23</sup> But then Landau read Grommer's dissertation, which he thereafter praised lavishly. That proved decisive, so that Grommer could take his degree in 1914. Hilbert presumably introduced him to Einstein some time during the latter's stay in Göttingen.

Grommer was soon providing Einstein with much-needed mathematical assistance for his highly speculative work on relativistic cosmology. In his famous 1917 paper, Einstein mentions Grommer's efforts to find centrally symmetric, static solutions of the original gravitational field equations that degenerated in a prescribed way at spatial infinity (Einstein 1917, 545). The futility of that effort led to Einstein's realization that an infinite universe was

---

<sup>23</sup> This information comes from the file on Grommer, Phil. Fak., Prom. G, vol. II, 1908-1914, Universitätsarchiv Göttingen.

impossible within the context of relativistic cosmology (presuming, of course, as everyone before Friedmann did, that the universe is stationary). Following this line of reasoning, Einstein was led to make a slight modification in the field equations, adding the so-called cosmological constant associated with a tiny repulsive force. Thus, Grommer was in on the ground-floor activity that enabled Einstein to launch relativistic cosmology. Thereafter, he continued to work as Einstein's personal mathematical assistant for twelve years until 1928, when he took a position in Minsk.<sup>24</sup> He died there four years later.

The reception and development of general relativity were also shaped by the larger forces of Weimar culture, including the breakdown of disciplinary boundaries that exacerbated tensions already building within academic communities. Weyl's influential *Raum-Zeit-Materie* (Weyl 1918), based on wartime lectures but which went through five editions between 1918 and 1923, reflects the hopes and fears of that era with a mixture of pathos and intellectual brilliance. Weyl was already looking beyond Einstein's theory of gravitation, which was based on Riemannian geometry, to a new unified field theory based on a general approach to differential geometry he found ideally suited to field physics. Enthusiasm for Weyl's new venture was short-lived, but nevertheless quickly felt. A young physics student in Graz named Otto Neugebauer lectured on these developments before finding his way to Munich to study with Sommerfeld. By 1923, when poverty and hyperinflation reigned, he was in Göttingen, where Richard Courant took him under his wing. Neugebauer soon left physics behind to become the era's great authority on the history of

---

<sup>24</sup> Among his published contributions to general relativity is (Grommer 1919).

ancient mathematics and astronomy. Yet reading his less technical work, one can clearly discern the profound impact of this flirtation with mathematical physics in his historical writings.<sup>25</sup> Neugebauer's lifelong friendship with Courant brought him into the center of the Göttingen culture that the latter cultivated all his life. Both lived in exile after 1933: Courant as a Jew with numerous enemies; Neugebauer as a Gentile who deeply loathed the Nazis.

Resurgent anti-Semitism had already reared its head during the early Weimar Republic, though many German Jews hoped that by ignoring it the phenomenon would go away. The past thirty years has spawned a vast literature dealing with complexities of this issue, including its role in German academic life, and it is to this topic, in particular Einstein's idiosyncratic approach, that we now turn. At the same time, we will attempt to show why his point of departure differed from that of nearly all his Jewish colleagues, indicating at the same time how his and their actions were provoked and reinforced by the mass media.

### **Einstein: In but not of Berlin**

As old foes and new upstarts vied for power in 1920, Germany's future looked most uncertain amid the chaos that followed the signing of the Versailles treaty. German academics too wavered in their attitude toward the old regime and in their commitment to the emerging republic. For Einstein there was no such hesitation. Though his pacifist and internationalist leanings were only haltingly articulated during the war, he was privately

---

<sup>25</sup> On Neugebauer's early career and relationship with Courant, see (Rowe 2012b).

unequivocal in his condemnation of Prussian militarism and its “religion of might.”<sup>26</sup> As the Emperor hurried into exile, Einstein began to speak openly about his political leanings. Indeed, these became an integral part of his rapidly spreading fame. His revolutionary theory of gravitation had interested almost no one during the war years with only a handful of colleagues writing about it.<sup>27</sup> All this changed dramatically on 6 November 1919 when the scientific elite of Great Britain gathered to announce that Einstein's prediction regarding the bending of light in the sun's gravitational field had been confirmed. Thereafter, the creator of general relativity was no longer merely a famous physicist: he emerged as one of the era's leading cultural icons as “Einstein” and “relativity” became watchwords for cultural modernity.<sup>28</sup>

In April 1918, not yet forty years old and with a brilliant arc of accomplishment in theoretical physics behind him, Einstein paused to reflect on the refuge that science afforded him. The occasion was a special session of the Deutsche Physikalische Gesellschaft honoring Max Planck on his sixtieth birthday.<sup>29</sup> Einstein spoke of those who find sanctuary in the temple of science, dismissing those who enter in order to display their virtuosity or pursue a

---

<sup>26</sup> A characteristic example is provided in a letter to Romain Rolland, a leading pacifist: “Dies Land ist durch den Waffenerfolg 1870, durch Erfolge auf dem Gebiete des Handels und der Industrie zu einer Art Machtreligion gekommen, die in Treitschke eine adäquaten, gar nicht übertriebenen Ausdruck gefunden hat. Diese Religion beherrscht fast alle Gebildeten; sie hat die Ideale der Goethe-Schiller-Zeit fast vollkommen verdrängt.” Einstein to Romain Rolland, 22 August 1917, *CPAE* Vol. 8, Document 374.

<sup>27</sup> In particular, Ernst Gehrcke, who had launched a series of critiques of Einstein's special theory beginning in 1911, concentrating his fire on the clock paradox and claiming that Minkowski's geometric formalism of spacetime was a mere solipsism. In the middle of the war, he accused the author of general relativity of plagiarism in (Gehrcke 1916).

<sup>28</sup> On this, see (Rowe 2012a). “Modernity” is used here in the sense of the contemporary popular media that associated Einstein and his theory with a rejection of tradition and the overthrow of the Newtonian conception of the universe.

<sup>29</sup> The lecture, entitled “Motive des Forschens,” was published in (Planck 1918).

career. The deserving few, like Planck and by implication Einstein himself, legitimize their presence by a single-minded commitment to a pure love of knowledge.

To this positive imagery Einstein added the notion of alienation: “Zunächst glaube ich mit Schopenhauer, daß eines der stärksten Motive, die zu Kunst und Wissenschaft hinführen, eine Flucht ist aus dem Alltagsleben mit seiner schmerzlichen Rauheit und trostlosen Öde.” The refuge served not only as an intellectual retreat; it was until then the center of Einstein’s emotional life, crowding out the concerns of daily life and leaving little room for self-examination and introspection. The time and place in which these images of sanctuary and escape are embedded is significant. Einstein did so against the backdrop of a Berlin beset by privation and bitterness in the fourth year of the First World War and of his own arrival in the German capital.

After leaving Munich in 1894 as a teenager, Einstein had spent his formative years in Switzerland, years that were marked by a disregard for questions of identity such as ethnicity or cultural affinity: “Solange ich in der Schweiz lebte, war ich mir meines Judentums nicht bewußt und war nichts in meinem Leben vorhanden, das auf meine jüdische Empfindung gewirkt und sie belebt hätte.”<sup>30</sup>

Confirmation of his theory of general relativity in November 1919 conferred upon Einstein a celebrity status never before accorded a living scientist. Views on moral and political issues, which had been confined to his correspondence and to tentative assertions in the early Berlin years, could now be broadcast to an international audience and carry great

---

<sup>30</sup> The article is entitled “Wie ich Zionist wurde,” based on an interview conducted before 30 May 1921 and published in *Jüdische Rundschau*, 21 June 1921, pp. 351-352. Republished in *CPAE* Vol. 7, Document 57.

weight. It was under these conditions that Einstein's isolation from worldly affairs truly came to an end. The collapse of the old regime made possible Einstein's emergence as a public figure. Newly gained press freedoms were a significant factor. Yet his decision to leave the temple of wisdom and engage with social and political issues was far more the result of a conscious redefinition for himself of the moral responsibility of the intellectual, a path only too seldom trod by his colleagues in the sciences.

Dearest to his heart in the first phase of his political involvement were the issues of a Jewish homeland and that of the need for international reconciliation, as well as for revitalizing scientific research and cooperation across national borders. His longstanding belief in internationalism was rooted in recognition of the need for scientific cooperation that knew no national bounds. This enduring conviction nourished a lifelong campaign to support the pacifist and anti-militarist movements, both of which aimed to realize a weapons-free world. His Jewish quest, on the other hand, was an attempt to reconcile a lofty social position as a member of the Prussian Academy of Sciences with membership in a marginalized minority.

At the beginning of 1920 he wrote two essays, never published, which revealed his initial faith in a positive relationship between the state and the Jew.<sup>31</sup> This positive assessment of Jewish accommodation was soon overwhelmed by the vehemence of a

---

<sup>31</sup> "Assimilation und Antisemitismus," and "Antisemitismus. Abwehr durch Erkenntnis," both ca. 3. April 1920. Published in *CPAE*, Vol. 7, Documents 34 and 35.

resurgent postwar anti-Semitism.<sup>32</sup> With some exceptions that we will note below, he was himself not subjected to the excesses of *Radau-Antisemitismus*. Yet what made his heart bleed, he later recounted, was to witness the pervasive discrimination and contempt heaped on the East European Jewish community in Berlin: “Ich sah, wie Schule, Witzblätter und unzählige kulturelle Faktoren der nichtjüdischen Mehrheit das Selbstgefühl auch der Besten meiner Stammesgenossen untergrub und fühlte, dass es *so* nicht weiter gehen dürfe.”<sup>33</sup> His conclusion was that rather than struggle for a place in German society, Jews should create a parallel cultural space, be it in Palestine or through emigration.

In spring 1920, he “converted” to Zionism,<sup>34</sup> a movement whose guiding principles came to define his public role. For Einstein, the dynamic of its appeal lay less in the prospect of a national homeland (as ambiguously promised in the Balfour Declaration of 1917)<sup>35</sup> than in its robust defense of Jewish pride. He further revealed his motive in converting when he rebuffed an offer to address the chief organization of the assimilationists, the Central-Verein deutscher Bürger jüdischen Glaubens soon after his conversion: “Wenn ich zu lesen kriege ‘Deutsche Bürger jüdischen Glaubens,’ so kann ich mich eines schmerzlichen Lächelns nicht

---

<sup>32</sup> Outbursts of anti-Semitic spleen in the postwar period were due in large part to Germany’s economic and political malaise following the collapse of the Empire. Venom was frequently directed at the most vulnerable members of the Jewish community and occasioned the writing in their defense of Einstein’s first public political text: “Die Zuwanderung aus dem Osten,” *Berliner Tageblatt* (30 December 1919), Morgen-Ausgabe, p. 2. Republished in *CPAE* Vol. 7, Document 29.

<sup>33</sup> To Willy Hellpach, 8 October 1929, Einstein Archives 46-656.

<sup>34</sup> The term is Kurt Blumenfeld’s, the individual who secured Einstein’s allegiance to Zionism (Blumenfeld 1962).

<sup>35</sup> The Balfour Declaration, actually a letter, 2 November 1917, from British Foreign Secretary Arthur Balfour to Baron Rothschild, a leader of the British Jewish community. The declaration, intended for dissemination to the Zionist Federation, stated that “His Majesty’s Government view with favour the establishment in Palestine of a national home for the Jewish people.” Both affected parties were disappointed. The principal Zionists had hoped for the formulation: “the Jewish national home,” while Palestinian Arab representatives in a petition rejected the idea of a Jewish nation “ruling over us and disposing of our affairs.”

erwehren. Was steckt in dieser schönen Bezeichnung, was ist denn jüdischer Glaube? Gibt es seine Art Unglauben, kraft dessen man aufhört, Jude zu sein? Nein. In jener Bezeichnung stecken aber zwei Geständnisse schöner Seelen, nämlich 1. ich will nichts zu tun haben mit meinen armen jüdischen (ostjüdischen) Brüdern, 2. ich will nicht als Kind meines Volkes angesehen werden, sondern nur als Mitglied einer religiösen Gemeinschaft. Ist das aufrichtig? Kann der Arier vor solchen Leisetretern Respekt haben.”<sup>36</sup>

What heightened his sense of moral outrage at the discrimination was the ugly fact that not only Gentiles engaged in anti-Semitism. Among Einstein’s fellow German Jews prejudice was frequently directed against their Russian and Polish brethren within the Jewish community. These socially and economically disadvantaged *Ostjuden*, numbering about 30,000 in Berlin, represented somewhat more than one-quarter of the total Jewish population of Berlin.<sup>37</sup> Their religious and social traditions, rooted in a *stetl* culture, appeared both strange and menacing to their more-assimilated German co-religionists. Various measures contemplated by the Prussian government to control and even deport them after the war exacerbated the fear of many German Jews that they were the real targets of official displeasure. While protesting the intentions of the authorities, Einstein dismissed the fear of his fellow Jews with the acerbic observation, “dass es eine jüdische Schwäche ist, stets

---

<sup>36</sup> Drafts of this document are dated 5 April 1920, though it was published as “Ein Bekenntnisbrief Einsteins” in *Israelitisches Wochenblatt für die Schweiz* on 24 September 1920, p. 10. Republished in *CPAE* Vol. 7, Document 37.

<sup>37</sup> Almost two-thirds of the *Ostjuden* had immigrated to Berlin between the end of the war and 1920 (Maurer 1986, 66, 76, 83).

angstvoll die Gojims bei guter Laune halten zu wollen.”<sup>38</sup> Jewish anti-Semitism, he thought, represented nothing less than a degrading ritual of diverting the anti-Semitism aimed at all Jews onto those least able to defend themselves. The chief repository of such sentiment lay with German Jews eager, if not desperate to assimilate. We will examine some representative figures below.

There was another element shaping Einstein’s newfound solidarity with the most vulnerable of his kinfolk: concern for the plight of young émigrés in the East European Jewish community of Berlin who sought a higher education. In his sister Maja Einstein-Winteler’s memoir of Einstein’s life, she singles out her brother’s empathy for the lost academic potential of young *Ostjuden* as decisive in the development of his Jewish identity.<sup>39</sup> In the following we trace the reactions of Einstein and others to several incidents that marked the turbulent course of the emerging Weimar polity. We will deal with four incidents chronologically, all of which took place in rapid succession in the year 1920, adding a critical mass of tension. They provide a glimpse into the centrality of the Jewish question, especially as reflected in a hail of press coverage. And they illustrate one of the central contentions of this paper, namely that Einstein must be placed into the context of events and personalities that were arrayed around and against him.

As a member of the Prussian Academy of Sciences, Einstein was not obligated to teach, but he was entitled to offer lecture courses at the University of Berlin, and occasionally did so. The brouhaha at one such lecture on relativity in February 1920 was headlined in local

---

<sup>38</sup> To Felix Frankfurter, 28 May 1921, *CPAE* Vol. 12, Document 139.

<sup>39</sup> “Albert Einstein--Beitrag für sein Lebensbild,” *CPAE* Vol. 1, preface, p. lx.

newspapers as “Tumultszenen bei einer Einstein-Vorlesung.”<sup>40</sup> The uproar began when Einstein announced an open admission policy to his *Privatvorlesung*. According to university regulations, only registered students, auditors, and docents of the university were entitled to attend, and the student council in particular insisted that the statutes be upheld. Yet the popularity of Einstein’s lectures knew no bounds, thanks largely to the sensational articles on general relativity in the popular press. Among the overflow crowd of more than 1500(!) that thronged to the auditorium were a large contingent of unregistered East European Jews. Following the lecture, Einstein threw the floor open to a discussion of his newly announced admission policy. For the most part, a decorous exchange ensued, at the end of which an orderly vote was taken in favor of throwing the lectures open to the public. In spite of earlier resistance, the student council and the rector of the university acquiesced.

In recounting the incident for a liberal newspaper, Einstein played down the anti-Semitic character of some of the lecture-hall comments but conceded: “doch konnte ihr *Unterton* so gedeutet werden.”<sup>41</sup> To a friend, he boasted: “Durch Gleichgültigkeit und spielende Behandlung des kleinen Zwischenfalles habe ich den Leuten die Angriffslust genommen.”<sup>42</sup> A number of the Berlin dailies took a less relaxed view. Regardless of their political stripe, they discussed the event as if Jewish motives, both anti- and pro-, were pivotal to the fracas in the lecture hall. Where one ultranationalist newspaper stressed the “vorwiegend asiatisches Gepräge des Publikums,” a not-too-subtle reference to the presence

---

<sup>40</sup> *8-Uhr Abendblatt*, “Vom Tage,” 13 February 1920, pp. 2,3. Republished in *CPAE* Vol. 7, Document 33.

<sup>41</sup> In the portion of the *Abendblatt* article subtitled “Eine Erklärung Professor Einsteins,” p. 3.

<sup>42</sup> To Heinrich Zangger, after 13 February 1920 in (Schulmann 2012, Document 215).

of East European Jews, the SPD-party organ claimed the disruptions were caused by the “antisemitischer Studentenpöbel gegen Einstein.”<sup>43</sup> A petition signed by almost 300 students rather lent credence to Einstein’s interpretation, speaking of “eine Aufbausung des Zwischenfalles” by the Berlin press.<sup>44</sup> The student council cited the same culprit. It published a declaration in the *Tägliche Rundschau*, in which it emphasized the fragility of the academic community when the daily media, irrespective of its political leanings, attempted through distorted press accounts to exploit events within the university.<sup>45</sup>

Next we touch on Einstein’s first open clash with the anti-relativists. He had already defended himself in the matter of his gravitation theory in one lengthy article (Einstein 1918), but fevered newspaper attacks increased after Einstein’s new status as a celebrity was confirmed. Writing to his close friend, Paul Ehrenfest, in December 1919, Einstein matter-of-factly reported: “Hier ist starker Antisemitismus und wütende Reaktion, wenigstens bei den ‘Gebildeten.’”<sup>46</sup> The Kapp Putsch three months later lowered the level of civil discourse even more. In autumn 1920, Einstein was in the audience for two lectures in the Berliner Philharmonie. The main concert hall was covered with anti-Semitic posters and leaflets, which found their complement in numerous anti-Jewish catcalls. The first talk was a harangue by the right-wing publicist Paul Weyland followed by an attack in more sober

---

<sup>43</sup> *Deutsche Zeitung*, 17 February 1920, p. 5; *Vorwärts*, 19 February 1920, Abend-Ausgabe, p. 2. The conservative rector of the University of Berlin, Eduard Meyer, took issue with the assessment of *Vorwärts* that anti-Semitism had played a role, a view with which the liberal *Berliner Tageblatt* agreed (14 February 1920, Morgen-Ausgabe, p. 2).

<sup>44</sup> Declaration by Students at the U. Berlin, 19 February 1920, *CPAE* Vol. 9, Document 320. The students go on to plead with Einstein “weiterhin Lehrer und Führer zu sein in das Gebiet, das Sie als Erster der bewundernden Mitwelt erschlossen haben.”

<sup>45</sup> *Tägliche Rundschau*, 18 February 1920, Morgen-Ausgabe, p. 6.

<sup>46</sup> Einstein to Ehrenfest, 4 December 1919, *CPAE* Vol. 9, Document 189.

fashion by the experimentalist Ernst Gehrcke. The speakers accused Einstein of engaging in plagiarism, “Massensuggestion,” and “wissenschaftlicher Dadaismus,” as well as seeking personal advancement (Weyland 1920). Three days later Einstein rose to the bait, referring dismissively to his opponents as spokesmen for a new organization he dubbed the “anti-relativitäts-theoretische G.m.b.H” (Einstein 1920). The platform for his article was the *Berliner Tageblatt*, referred to by the anti-relativists and others on the right as “das Judenblatt.” What stung Einstein more than the anti-Semitism surrounding the *Philharmonie* event was the charge leveled against him of publicity seeking and grandiloquence. In the *Tageblatt* article he protested: “Ich kann wohl sagen, dass ich zeitlebens ein Freund des wohlwogeneren, nüchternen Wortes und der knappen Darstellung gewesen bin. Vor hochtönenden Phrasen und Worten bekomme ich eine Gänsehaut” (Einstein 1920, 1). A chastened Einstein soon regretted losing his composure in responding to his attackers, in particular dragging the experimentalist Philipp Lenard into the fray by questioning Lenard’s competence as a theoretical physicist.<sup>47</sup> Einstein also came to recognize that his new-found popularity was a two-edged sword: Opinions eagerly sought were often misquoted and instrumentalized once in print.

This truth seems to have escaped his friend Hedwig Born, wife of the physicist Max Born. In rebuking Einstein for descending to the level of his *Philharmonie* attackers, she advised him simply to ignore the assaults and return to the temple of wisdom he had invoked

---

<sup>47</sup> *Ibid*, p. 1: “Ich bewundere Lenard als Meister der Experimentalphysik, in der theoretischen Physik aber hat er noch nichts geleistet, und seine Einwände gegen die allgemeine Relativitätstheorie sind von solcher Oberflächlichkeit, daß ich es bis jetzt nicht für nötig erachtet habe, ausführlich auf dieselben zu antworten.”

in his *Festrede* on Planck two years earlier.<sup>48</sup> This was unrealistic on at least two counts—the media had its claws in him and would never let him go, and his Zionist conviction militated against slinking back into the ivory tower.

A month later, this convergence of political and scientific conflicts reached a high point at a meeting of the Gesellschaft Deutscher Naturforscher und Ärzte at Bad Nauheim. In attacking Lenard in his *Tageblatt* article, Einstein had brought Lenard's wrath down on his own head. He had however also inadvertently widened the political fissures that divided the physics community. In Bad Nauheim he now had to debate Lenard, who categorically rejected relativity as contrary to common sense and hence *undeutsch*. No verbatim record of the exchange is available, though Weyland, writing in the ultranationalist *Deutsche Zeitung*, claimed that “unter der Leitung Lenards [wird] die Vergewaltigung der Physik durch mathematische Dogmen abgelehnt . . . , während auf der anderen Seite die Einsteinophilen auf ihrem Standpunkt beharren und hurtig den Parnaß ihres Formelkrames zu erklimmen versuchen” (Weyland 1920b). Even Weyland conceded, however, that the physics establishment had carried the day.

In a discussion of the fourth event, we move beyond Einstein to consider the views of Hedwig and Max Born, as well as of Alexander Moszkowski, the editor of the journal, *Lustige Blätter*. The trigger for this drama in autumn 1920 was Moszkowski's imminent publication of his account of conversations with Einstein. In addition to writing books of aphorisms and humor, Moszkowski was a popularizer of scientific topics, including relativity

---

<sup>48</sup> Hedwig Born to Einstein, 8 September 1920, *CPAE* Vol. 10, Document 138.

theory, which he lavishly praised in a number of books and articles.<sup>49</sup> He met Einstein during the war years and their families frequently socialized. Although Einstein was wary of Moszkowski's ability to convey his work to a wider public, he enjoyed the company of his "Minnesänger," and consented to a series of interviews for publication, tentatively entitled "Gespräche mit Einstein."<sup>50</sup>

When the Borns learned of this prospective opus, Hedwig hurriedly reviewed Moszkowski's earlier literary output and discovered one of his satirical essays entitled "Der jüdische Faust," in which Moszkowski mimicked the vocabulary and inflection of the yiddish-speaking *Ostjude*. Anticipating the notoriety that would follow from a publication that struck a similar vein of what she called "jüdische Schnoddrigkeit," Born launched an intense private campaign to convince Einstein to withdraw permission for the book.<sup>51</sup> She feared that Moszkowski's hero-worship of Einstein combined with evocations of East European Jewry would lend credence to the accusations of the anti-relativists, sully Einstein's name, and undermine further the status of German Jews: An attitude that mirrored with uncanny similarity the very German-Jewish prejudice toward *Ostjuden* that Einstein disdained and that drew him to the Zionist movement in the first place.<sup>52</sup>

---

<sup>49</sup> (Moszkowski 1917, 209-245) discusses general relativity for a general audience. His worshipful article on Einstein appeared as "Die Sonne bracht's an den Tag!," *Berliner Tageblatt*, 8 October 1919, Abend-Ausgabe.

<sup>50</sup> Finally published as (Moszkowski 1921).

<sup>51</sup> "Der jüdische Faust" appeared in (Moszkowski 1908); Hedwig Born to Einstein, 7 October 1920, Vol. 10, Document 166.

<sup>52</sup> Many *Ostjuden* had fled pogroms in the Russian lands; others had immigrated to perform labor service voluntarily during the war years. Various measures contemplated by the Prussian government to control and even deport them after the war exacerbated the fear of many German Jews that they were the real targets of official displeasure. The resulting Jewish anti-Semitism, Einstein thought, represented nothing less than a degrading ritual of diverting the anti-Semitism aimed at all Jews onto those least able to defend themselves.

Max Born was as indignant as his wife about this affair. Part of his vehemence was due to the fact that he had, in his own recent popular exposition of the theory of relativity, been scolded by colleagues for including a photo and short biography of Einstein.<sup>53</sup> The intertwined factors of anti-Semitism and publicity were paramount however: “Du *musst* den Moszkowski abschütteln, sonst hat der Weyland auf der ganzen Linie gesiegt, Lenard und Gehrcke triumphieren.”<sup>54</sup> Born pointed out that while Einstein might flee the country for other professional opportunities, he and other assimilated Jews at the beginning of their careers “sitzen hier fest im Lande der Weyland, Lenard, Wien und Konsorten.” He insisted that Einstein seek legal recourse if Moszkowski did not halt the presses.<sup>55</sup>

In the event, it was too late to stop publication. Almost immediately after receiving Hedwig Born’s admonition, Einstein had written his Eckermann to cease and desist while shrugging off the Borns’ advice to pursue legal action.<sup>56</sup> Moszkowski was too heartsick to respond, so wife Bertha assured Einstein that the title of the book would be changed to: *Einstein—Einblicke in seine Gedankenwelt* and a preface written absolving Einstein of all responsibility for the book’s content. At the same she chided Einstein that his reputation as a scientist was in any case secure against a frenzied media.<sup>57</sup>

The original motives of her husband are easy to divine: publication promised pecuniary gain, as the Borns were cruelly eager to point out, but there was another factor at

---

<sup>53</sup> The most pointed objection came from Max von Laue: (Born 2005, 41).

<sup>54</sup> Max Born to Einstein, 13 October 1920, *CPAE* Vol. 10, Document 175

<sup>55</sup> Max Born to Einstein, 28 October 1920, *CPAE* Vol. 10, Document 185.

<sup>56</sup> Einstein announced to Born that he had, in a registered letter, informed Moszkowski, “*dass sein herrliches Opus nicht gedruckt werden darf*” [underlined in the original]. To Max Born, 11 October 1920, *CPAE* Vol. 10, Document 174.

<sup>57</sup> Bertha Moszkowski to Einstein, 22 October 1920, *CPAE* Vol. 10, Document 180.

play. Raised in Breslau in a well-to-do family, Moszkowski was born in Poland, a fact that stamped him immediately as an outsider in Germany. By hitching himself to Einstein's star—an action that the Borns so feared—he might enhance his status. For the Borns, on the other hand, status was conferred by their hard won academic niche in Göttingen, itself rooted in the assimilationist longings of the German-Jewish bourgeoisie. Einstein and his wife were quite sympathetic to Moszkowski's financial motives and shrugged off the consequences of media attention. Indeed, Hedi Born accused wife Elsa of readily succumbing to any form of public flattery.<sup>58</sup> Husband Albert found the mercenary character of Moszkowski far more reasonable and desirable than the *Stänkerei* of a Lenard and associates. As to unwanted publicity, he resolved “alles, was meiner wartet, erleben wie ein unbeteiligter Zuschauer und mich nicht mehr wie in Nauheim in Erregung versetzen lassen.”<sup>59</sup>

Having to carve out a Jewish identity on arriving in Berlin set Einstein apart from assimilated Jewish colleagues like the Borns, who repressed all thought that they might not belong. Einstein's sympathy for the underdog and his distaste for the smugness of the bourgeoisie awakened in him further confirmation of his marginal status rather than a feeling of personal vulnerability to anti-Jewish sentiment and media pressures.

The pacifist Romain Rolland had noted that Einstein's estrangement during wartime from the academic and political atmosphere in Berlin ran deep. But interestingly, he observed that Einstein drew a sharp line between the attitudes of humanists and scientists, anticipating

---

<sup>58</sup> “Da Sie Schmeicheleien äußerst zugänglich sind, trübt sich Ihr Urteil und Sie sind jedem dankbar, der vor Albert schweifwedelt”: Hedwig Born to Elsa Einstein, 18 November 1920, Einstein Archives 65 850.

<sup>59</sup> Einstein to Max Born, 26 October 1920, *CPAE* Vol. 10, Document 182.

what C. P. Snow would later call the “two cultures” phenomenon: “Einstein divides [the university intellectuals] into two very distinct classes---the mathematicians, physicists, and exact scientists, who are tolerant, and the historians and philologists, who talk like lunatics from sheer national passion.”<sup>60</sup> Here we see striking parallels with the atmosphere in Göttingen. Einstein clearly knew that a similar rift prevailed there, and he was fully aware that Hilbert’s efforts to promote an open-ended milieu were viewed with deep misgivings by his colleagues in the *Geisteswissenschaften*.

The audience Einstein encountered when he delivered his Wolfskehl lectures contained women, foreigners, Jews, and even a few *lateinlose Studenten*; these were certainly not the traditional clientele one found at most German universities. Afterward he wrote Zangger: “Je länger dieser scheussliche Kriegzustand dauert, desto ärger verbeissen sich die Menschen in unvernünftigen Hass, der in nichts begründet ist ... Doppelt aber freut man sich in dieser Zeit über die wenigen Menschen, die ganz über der Situation stehen und sich nicht von dem trüben Strome der Zeit treiben lassen. Ein solcher ist Hilbert, der Göttinger Mathematiker. Ich war eine Woche in Göttingen wo ich ihn kennen und lieben lernte.”<sup>61</sup>

We know almost nothing about what Einstein and Hilbert talked about during the physicist’s week in Göttingen, but surely Hilbert told him something about his many battles in the philosophical faculty, where the other side, mainly conservative humanists, tried to throw up roadblocks at every turn. Clearly, Einstein knew about Hilbert’s failed attempt to push through Emmy Noether’s *Habilitation* in 1915. Undoubtedly he learned from Hilbert

---

<sup>60</sup> Diary entry of Sept 16, 1915, cited in (Fölsing 1997, 365-367).

<sup>61</sup>Einstein to Heinrich Zangger, 7 July 1915 in (Schulmann 2012, Document 79).

that only a short time earlier he had succeeded in blocking the appointment of the rabid nationalist, Johannes Stark, to the Göttingen chair in experimental physics. Stark had impeccable scientific credentials, but Hilbert also knew that he was an outspoken anti-Semite and, for that very reason, unacceptable for Göttingen.<sup>62</sup> As for the general wartime atmosphere in Göttingen, we merely need cite a passage from a letter Einstein wrote to Max Born, who had sought his advice as to whether he should leave Frankfurt to accept the chair in theoretical physics in Göttingen. Einstein wished to make no strong recommendation, but he made his own inclinations perfectly known when he replied: “mir wäre es unerträglich, auf einen kleinen Kreis aufgeblassener und meist engherziger (und –denkender) Gelehrter so angewiesen zu sein (kein anderer Verkehr). Denk daran, was Hilbert ausgestanden hat von dieser Gesellschaft.”<sup>63</sup>

But whatever else he heard from Hilbert during his first visit in the summer of 1915, Einstein left Göttingen not just pleased that the mathematicians took to his theory of gravitation but with the satisfaction of having found in Hilbert a true “comrade of conviction” – and he used that term, “*Gesinnungsgenosse*,” advisedly. For Einstein, this meant someone who believed not only that science knew no national boundaries but that the honor of belonging to the international community of scientists deserved precedence over any sense of

---

<sup>62</sup> Hilbert's campaign against the appointment of Stark and the purely political motivations behind it are documented in Rep. 76 Va Sect. 6. Tit. IV, 1, Vol. XXIV, BI. 341-376, Geheimes Staatsarchiv Preußischer Kulturbesitz.

<sup>63</sup> Einstein to Max Born, 3 March 1920, *CPAE* Vol. 9 Document 337.

patriotic duty or ethnic identity. Hilbert, unlike the vast majority of German professors but in complete accord with Einstein, never equivocated on this principle.<sup>64</sup>

## References

Blumenfeld, Kurt. 1962. *Erlebte Judenfrage*. Stuttgart: DVA.

Blumenthal, Otto. 1935. “Lebensgeschichte,” in (Hilbert 1935, vol. 3, 388-429).

Born, Max. 1978. *My Life; Recollections of a Nobel Laureate*. London: Taylor & Francis.

Born, Max, ed. 2005. *The Born-Einstein Letters, 1916-1955. Friendship, Politics, and Physics in Uncertain Times*. New York: Macmillan.

Corry, Leo. 2004. *David Hilbert and the Axiomatization of Physics (1898-1918): From Grundlagen der Geometrie to Grundlagen der Physik*. Dordrecht: Kluwer.

Einstein, Albert. 1917. “Kosmologische Betrachtungen zur allgemeinen Relativitätstheorie.” *Königlich Preußische Akademie der Wissenschaften* (Berlin). *Sitzungsberichte* (1917): 142–152; reprinted in *CPAE*, vol. 6, pp. 540-552.

\_\_\_\_\_. 1918. “Dialog über Einwände gegen die Relativitätstheorie,” *Naturwissenschaften* 6 (29 November 1918), No. 48, pp. 697-702. Republished in *CPAE* vol. 7, Document 13.

\_\_\_\_\_. 1920. “Meine Antwort . Ueber die anti-relativitätstheoretische G.m.b.H.” *Berliner Tageblatt*, 27 August 1920, Morgen-Ausgabe, pp. 1-2. Republished in *CPAE* vol. 7, Document 45.

---

<sup>64</sup> During World War I, Hilbert was a vehement opponent of territorial annexation and refused to sign the Manifesto to the Civilized World in autumn 1914. Recognizing that nothing would change politically until the “Wahnsinns-orkan ausgetobt hat,” he suggested that he and Einstein write an open letter after the war “an die Professoren und Gelehrten Deutschlands ... , in dem jedes Wort unanfechtbar sein muss und wie ein Keulenschlag wirken wird, wo wir sagen, was Wissenschaft ist und wozu Wissenschaft verpflichtet” Hilbert to Einstein, 1 May 1918, *CPAE* Vol. 8, Document 530.

\_\_\_\_\_. 1923. "Notiz zu der Arbeit von A. Friedmann ,Über die Krümmung des Raumes',," *Zeitschrift für Physik*, 16: 228.

\_\_\_\_\_. 1996. *Collected Papers of Albert Einstein (CPAE)*, vol. 6: *The Berlin Years: Writings, 1914-1917*, A. J. Kox, et al., eds., Princeton: Princeton University Press.

\_\_\_\_\_. 1998a. *Collected Papers of Albert Einstein (CPAE)*, vol. 8A: *The Berlin Years: Correspondence, 1914-1917*, Robert Schulmann, et al., eds. Princeton: Princeton University Press.

\_\_\_\_\_. 1998b. *Collected Papers of Albert Einstein (CPAE)*, vol. 8B: *The Berlin Years: Correspondence, 1918*, Robert Schulmann, et al., eds. Princeton: Princeton University Press.

\_\_\_\_\_. 2002. *Collected Papers of Albert Einstein (CPAE)*, vol. 7: *The Berlin Years: Writings, 1918-1921*, Michel Janssen, et al., eds., Princeton: Princeton University Press, 2002.

Fölsing, Albrecht. 1997. *Albert Einstein: A Biography*, Viking, New York.

Frei, Günther. 2004. "On the History of the Artin Reciprocity Law in Abelian Extensions of Algebraic Number Fields: How Artin was led to his Reciprocity Law," in (Laudal & Piene 2004, 267-294).

Frenkel, Viktor. 2002. "Einstein and Friedmann," *Einstein Studies in Russia*, Y. Balashov and V. Vizgin, eds., Einstein Studies, vol. 10 (2002), Boston: Birkhäuser, pp. 1-16.

Gay, Peter. 1968. *Weimar Culture: The Outsider as Insider*, New York: Harper & Row.

Gehrcke, Ernst. 1916. "Zur Kritik und Geschichte der neueren Gravitationstheorien," *Annalen der Physik* 51: 119-124.

Grommer, Jakob. 1919. „Beitrag zum Energiesatz in der allgemeinen Relativitätstheorie.“ *Königlich Preußische Akademie der Wissenschaften (Berlin). Sitzungsberichte (1919)*: 860-862.

Hentschel, Klaus. 1990. *Interpretationen und Fehlinterpretationen der speziellen und der allgemeinen Relativitätstheorie durch Zeitgenossen Albert Einsteins*, Basel: Birkhäuser.

Hermann, Armin, Meyenn, Karl von, Weisskopf, Victor, eds. 1979. *Wolfgang Pauli. Wissenschaftlicher Briefwechsel*, Bd. 1, New York: Springer-Verlag.

Hilbert, David. 1915. “Die Grundlagen der Physik. (Erste Mitteilung),” *Königliche Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Nachrichten*: 395–407.

\_\_\_\_\_. 1932-35, *Gesammelte Abhandlungen*, 3 vols., Berlin: Springer.

Janssen, Michel and Renn, Jürgen. 2007. “Untying the Knot: How Einstein Found His Way Back to Field Equations Discarded in the Zurich Notebook,” in (Renn 2007, vol. 2, 839–925).

Kastrup, Hans. 1987. „The Contributions of Emmy Noether, Felix Klein, and Sophus Lie to the Modern Concept of Symmetries in Physical Systems,” in *Symmetries in Physics (1600-1980)*, ed. M. Doncel, A. Hermann, L. Michel, A. Pais. Barcelona: Seminari d’Història de les Ciències, Universitat Autònoma de Barcelona.

Klein, Felix. 1918a. “Zu Hilberts erster Note über die Grundlagen der Physik.” *Königliche Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Nachrichten*: 469-472; reprinted in (Klein 1921, 553-565).

\_\_\_\_\_. 1918b. “Über die Differentialgesetze für die Erhaltung von Impuls und Energie in der Einsteinschen Gravitationstheorie.” *Königliche Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Nachrichten*: 171–189; reprinted in (Klein 1921, 568-585).

\_\_\_\_\_. 1918c. “Über die Integralform der Erhaltungssätze und die Theorie der räumlich-geschlossenen Welt.” *Königliche Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Nachrichten*: 394–423; reprinted in (Klein 1921, 586-612).

\_\_\_\_\_. 1921. *Gesammelte Mathematische Abhandlungen*, vol. 1, Berlin: Julius Springer.

Kosmann-Schwarzbach, Yvette. 2004. *Les Théorèmes de Noether. Invariance et lois de conservation au XXe siècle*. Paris : Les Éditions de L’école Polytechnique.

Kragh, Helge. 1999. *Cosmology and Controversy. The Historical Development of two Theories of the Universe*. Princeton: Princeton University Press.

Laqueur, Walter. 1974. *Weimar, A Cultural History 1918-1933*, New York: Perigree.

Laudal, Olav Arnfinn and Piene, Ragni. 2004. *The Legacy of Niels Henrik Abel*, Berlin: Springer Verlag, 2004.

- Maurer, Trude. 1986. *Ostjuden in Deutschland 1918-1933*. Hamburg: Hans Christians.
- Moszkowski, Alexander. 1908. *Das Freibad der Musen. Sprudelnde Verse*. Berlin: Verlag der Lustigen Blätter.
- \_\_\_\_\_. 1917. *Der Sprung über den Schatten. Betrachtungen auf Grenzgebieten*. Munich: Langen.
- \_\_\_\_\_. 1921. *Einstein: Einblicke in seine Gedankenwelt. Gemeinverständliche Betrachtungen über die Relativitätstheorie und ein neues Weltsystem. Entwickelt aus Gesprächen mit Einstein*. Hamburg: Hoffmann und Campe.
- Noether, Emmy. 1918. "Invariante Variationsprobleme," *Königliche Gesellschaft der Wissenschaften zu Göttingen. Mathematisch-physikalische Klasse. Nachrichten*: 235-257.
- North, John D. 1965. *The Measure of the Universe: A History of Modern Cosmology*. Oxford: Clarendon Press; reprinted New York: Dover, 1990.
- Pais, Abraham. 1982. 'Subtle is the Lord. : .' *The Science and the Life of Albert Einstein*. Oxford: Clarendon Press.
- Pauli, Wolfgang. 1921. "Relativitätstheorie," in Arnold Sommerfeld, ed., *Encyklopädie der mathematischen Wissenschaften, mit Einschluss ihrer Anwendungen*, vol. 5, *Physik*, part 2, Leipzig: Teubner, pp. 539–775.
- Planck, Max. 1918. *Zu Max Plancks sechzigstem Geburtstag, Ansprachen, gehalten am 26. April 1918 in der Deutschen Physikalischen Gesellschaft von E. Warburg, M. v. Laue, A. Sommerfeld und A. Einstein*. Karlsruhe: C.F. Müllersche Hofbuchhandlung, 1918, pp. 29-32. Republished in *CPAE* vol. 7, Document 7.
- Pyenson, Lewis. 1979. "Mathematics, Education, and the Göttingen Approach to Physical Reality, 1890-1914," *Europa: A Journal of Interdisciplinary Studies*, 2(2): 91-127.
- \_\_\_\_\_. 1985. *The Young Einstein*. London: Adam Hilger.
- Reid, Constance. 1970. *Hilbert*. New York: Springer Verlag.
- \_\_\_\_\_. 1976. *Courant in Göttingen and New York*. New York: Springer-Verlag.
- Renn, Jürgen, ed. 2007. *The Genesis of General Relativity*, 4 vols. Dordrecht: Springer.

Renn, Jürgen and Stachel, John. 2007. "Hilbert's Foundation of Physics: From a Theory of Everything to a Constituent of General Relativity," in (Renn 2007, vol. 4, 857-973).

Röhle, Stefan. 2007. *Willem de Sitter in Leiden - ein Kapitel in der Rezeptionsgeschichte der Relativitätstheorien*, Dissertation, Johannes Gutenberg-Universität Mainz.

Rowe, David E. 1999. "The Göttingen Response to General Relativity and Emmy Noether's Theorems," in Jeremy Gray, ed., *The Symbolic Universe. Geometry and Physics, 1890-1930*. Oxford: Oxford University Press, pp. 189-234.

\_\_\_\_\_. 2002. "Einstein's Gravitational Field Equations and the Bianchi Identities," *Mathematical Intelligencer*, 24(4): 57-66.

\_\_\_\_\_. 2003a. "Mathematical Schools, Communities, and Networks," in *Cambridge History of Science*, vol. 5, *Modern Physical and Mathematical Sciences*, ed. Mary Jo Nye, Cambridge: Cambridge University Press, pp. 113-132.

\_\_\_\_\_. 2003b. "Hermann Weyl, the Reluctant Revolutionary," *Mathematical Intelligencer*, 25(1): 61-70.

\_\_\_\_\_. 2004a. "Making Mathematics in an Oral Culture: Göttingen in the Era of Klein and Hilbert," *Science in Context* 17(1/2): 85-129.

\_\_\_\_\_. 2004b. "The Mathematicians' Happy Hunting Ground: Einstein's General Theory of Relativity," *Mathematical Intelligencer*, 26(2): 58-66.

\_\_\_\_\_. 2012a. "Einstein and Relativity: What Price Fame?," *Science in Context*, 25 (2): 197-246.

\_\_\_\_\_. 2012b. "Otto Neugebauer and Richard Courant: On Exporting the Göttingen Approach to the History of Mathematics," *Mathematical Intelligencer*, 34 (2): 29-37.

Rowe, David and Schulmann, Robert, eds. 2007. *Einstein on Politics: His Private Thoughts and Public Stands on Nationalism, Zionism, War, Peace, and the Bomb*, Princeton: Princeton University Press.

Sauer, Tilman. 1999. "The Relativity of Discovery: Hilbert's First Note on the Foundations of Physics." *Archive for History of Exact Sciences* 53: 529-575.

\_\_\_\_\_. 2002. "Hopes and Disappointments in Hilbert's Axiomatic 'Foundations of Physics,'" in *History of Philosophy of Science*, M. Heidelberger and F. Stadler, eds. Dordrecht: Kluwer, pp. 225-237.

Schwarzschild, Karl. 1916a. "Über das Gravitationsfeld eines Massenpunktes nach der Einsteinschen Theorie." *Königlich Preussische Akademie der Wissenschaften (Berlin). Sitzungsberichte* (1916): 189-196.

\_\_\_\_\_. 1916b. "Über das Gravitationsfeld einer Kugel aus inkompressibler Flüssigkeit nach der Einsteinschen Theorie." *Königlich Preussische Akademie der Wissenschaften (Berlin). Sitzungsberichte* (1916): 424-434.

Schulmann, Robert, ed. 2012. *Seelenverwandte – Der Briefwechsel zwischen Albert Einstein und Heinrich Zangger (1910–1947)*, Zürich: Neue Zürcher Zeitung.

Tollmien, Cordula. 1990. "'Sind wir doch der Meinung, dass ein weiblicher Kopf nur ganz ausnahmsweise in der Mathematik schöpferisch tätig sein kann. . . , Emmy Noether 1882-1935,'" *Göttinger Jahrbuch*, 38: 153-219.

Vizgin, Vladimir P. 1994. *Unified Field Theories in the First Third of the 20th Century*, Science Networks, vol. 13, Basel: Birkhäuser.

Vizgin, Vladimir and Frenkel, Viktor. 2002. "Vsevolod Frederiks, Pioneer of Relativism and Liquid Crystal Physics," *Einstein Studies in Russia*, Y. Balashov and V. Vizgin, eds., Einstein Studies, vol. 10 (2002), Boston: Birkhäuser, pp. 149-180.

Weyl, Hermann. 1918. *Raum, Zeit, Materie*, 1st ed., Berlin: J. Springer.

\_\_\_\_\_. 1944. "David Hilbert and his Mathematical Work," *Bulletin of the American Mathematical Society*, 50: 612-654; reprinted in (Weyl 1968, vol. 4, 130-172).

\_\_\_\_\_. 1949. "Relativity as a Stimulus to Mathematical Research," *Proceedings of the American Philosophical Society*, 93: 535-541; reprinted in (Weyl 1968, vol. 4, 394-400).

\_\_\_\_\_. 1968. *Gesammelte Abhandlungen*, 4 vols., Heidelberg: Springer.

Weyland Paul. 1920a. "Betrachtungen über Einsteins Relativitätstheorie und die Art ihrer Einführung. Vortrag gehalten am 24. August 1920 im großen Saal der Philharmonie zu Berlin," *Schriften aus dem Verlage der Arbeitsgemeinschaft deutscher Naturforscher zur Erhaltung reiner Wissenschaft e. V.* Heft 2. Berlin: Arbeitsgemeinschaft deutscher Naturforscher zur Erhaltung reiner Wissenschaft e. V./Köhler, 1920.

\_\_\_\_\_. 1920b. "Die Naturforschertagung in Nauheim. Erdrosselung der Einsteingegner!" *Deutsche Zeitung*, 26 September 1920, Morgen-Ausgabe, 1. Beiblatt, p. 1.

Yavelov, Boris. 2002. "Einstein's Zurich Colloquium," *Einstein Studies in Russia*, Y. Balashov and V. Vizgin, eds., *Einstein Studies*, vol. 10 (2002), Boston: Birkhäuser, pp. 261-296.



## MAX-PLANCK-INSTITUT FÜR WISSENSCHAFTSGESCHICHTE

Max Planck Institute for the History of Science

### Preprints since 2012 (a full list can be found at our website)

- 422** Pietro Daniel Omodeo, Irina Tupikova **Aristotle and Ptolemy on Geocentrism: Diverging Argumentative Strategies and Epistemologies** (TOPOI – Towards a Historical Epistemology of Space)
- 423** Han F. Vermeulen **Linguistik und Völkerkunde – der Beitrag der historisch-vergleichenden Linguistik von G.W. Leibniz zur Entstehung der Völkerkunde im 18. Jahrhundert** [Leicht erweiterte Fassung des Working Papers No. 133 aus dem MPI for Social Anthropology]
- 424** Alfred Gierer **Mit Schiller gegen den „Egoismus der Vernunft“**. Zeitübergreifende Gedanken zur Natur des Menschen
- 425** Annette Vogt **Die Berliner Humboldt-Universität von 1945/1946 bis 1960/1961**
- 426** Klaus Geus, Martin Thiering (eds.) **Common Sense Geography and Mental Modelling**
- 427** Renate Wahsner **Kann eine moderne Naturphilosophie auf Hegelsche Prinzipien gegründet werden?** Spekulative und naturwissenschaftliches Denken
- 428** Stefano Bordoni **Widening the Scope of Analytical Mechanics** Duhem's third pathway to Thermodynamics
- 429** Pietro Daniel Omodeo **Copernicus in the Cultural Debates of the Renaissance: Reception, Legacy, Transformation** [Part I & II]
- 430** Mark Geller & Klaus Geus (eds.) **Productive Errors: Scientific Concepts in Antiquity** (TOPOI – Dahlem Seminar for the History of Ancient Sciences)
- 431** Klaus Gottstein **The Amaldi Conferences. Their Past and Their Potential Future**
- 432** Mikuláš Teich **The Scientific Revolution Revisited**
- 433** Lorraine Daston & Jürgen Renn (Hrsg.) **Festkolloquium für Hans-Jörg Rheinberger** Beiträge zum Symposium am 24. 1. 2011 im Max-Planck-Institut für Wissenschaftsgeschichte
- 434** Conference **Epistemology and History. From Bachelard and Canguilhem to Today's History of Science**
- 435** Jens Høyrup **Sanskrit-Prakrit interaction in elementary mathematics as reflected in Arabic and Italian formulations of the rule of three – and something more on the rule elsewhere**
- 436** Jens Høyrup **A hypothetical history of Old Babylonian mathematics: places, passages, stages, development**
- 437** Jürgen Renn **Schrödinger and the Genesis of Wave Mechanics**
- 438** Pietro Daniel Omodeo **L'iter europeo del matematico e medico scozzese Duncan Liddel**
- 439** Irina Tupikova & Klaus Geus **The Circumference of the Earth and Ptolemy's World Map**
- 440** Pietro Daniel Omodeo und Jürgen Renn **Das Prinzip Kontingenz in der Naturwissenschaft der Renaissance**
- 441** Horst Kant und Jürgen Renn **Eine utopische Episode – Carl Friedrich von Weizsäcker in den Netzwerken der Max-Planck-Gesellschaft**
- 442** William G. Boltz and Matthias Schemmel **The Language of 'Knowledge' and 'Space' in the Later Mohist Canon** (TOPOI – Towards a Historical Epistemology of Space)

- 443** Stefano Bordoni **Looking for a Rational Thermodynamics in the late XIX century**
- 444** Sonja Brentjes and Jürgen Renn **The Arabic Transmission of Knowledge on the Balance**
- 445** Horst Nowacki **Archimedes and Ship Design**
- 446** Matthias Schemmel **Elements of a Historical Epistemology of Space** (TOPOI – Towards a Historical Epistemology of Space)
- 447** Martin Thiering and Wulf Schiefenhövel **Spatial Concepts in Non-Literate Societies: Language and Practice in Eipo and Dene Chipewyan** (TOPOI – Towards a Historical Epistemology of Space)
- 448** Jürgen Renn **Einstein as a Missionary of Science**
- 449** Hubert Laitko **Der Ambivalenzbegriff in Carl Friedrich von Weizsäckers Starnberger Institutskonzept**
- 450** Stefano Bordoni **When Historiography met Epistemology.** Duhem's early philosophy of science in context
- 451** Renate Wahsner **Tausch – Allgemeines – Ontologie oder Das Auseinanderlegen des Konkreten und seine Aufhebung**
- 452** Jens Høyrup **Algebra in Cuneiform.** Introduction to an Old Babylonian Geometrical Technique
- 453** Horst Nowacki **Zur Vorgeschichte des Schiffbauversuchswesens**
- 454** Klaus Geus and Mark Geller (eds.) **Esoteric Knowledge in Antiquity** (TOPOI – Dahlem Seminar for the History of Ancient Sciences Vol. II)
- 455** Carola Sachse **Grundlagenforschung. Zur Historisierung eines wissenschaftspolitischen Ordnungsprinzips am Beispiel der Max-Planck-Gesellschaft (1945–1970)**