INTRODUCTION TO VOLUME 12

In 1921, Einstein was away from Berlin for more than six months. He traveled within Continental Europe and, for the first time, to the United States and England, lecturing on his work to both specialized and general audiences, and promoting international reconciliation and collaboration among scientists of former enemy countries.

Einstein had become a well-known scientist and an increasingly visible public figure. His work on relativity was being widely discussed among physicists, astronomers, and mathematicians. During this year, his scientific activities centered on theoretical work on the unification of gravity and electromagnetism, and on experimental investigations concerning certain implications of quantum theory. Meanwhile, the number of scientific books and articles that followed up on his earlier researches rose dramatically, an effervescence to which Einstein himself contributed through his lectures and appearances that popularized relativity among scientists and general audiences. He was also called upon to take concrete action or, at least, to clarify his views on myriad other topics. He worked toward the establishment of the Hebrew University, and acted decisively on behalf of international reconciliation and cooperation. But his voluminous correspondence documents many other significant events, and provides rich material for a deeper understanding of the multiplying spheres of Einstein's interests, activities, and interactions.

The present volume draws on more than 2,000 documents written by, to, and about Einstein during 1921. It opens with eleven letters pertaining to dates earlier than 1921 that are followed by 349 letters selected for full-text presentation.

Of the 291 available letters authored by Einstein in 1921, we present 169 as full texts, together with 180 from among the more than 500 extant letters that he received. The Calendar contains references to several hundred items. Among them, a substantial exchange with various publishers testifies to the growing demand for Einstein's publications in their original German version, and also for translations of his writings into English, French, Spanish, Italian, Russian, Polish, Hungarian, Ukrainian, Japanese, Romanian, Yiddish, and Hebrew. The letters reveal many unknown or hitherto little-explored facets of both his work and of his relationships to not only colleagues, friends, and family, but also the many people, institutions, and causes that he encountered for the first time during 1921.

I

Following his lively involvement in Jewish affairs in late 1919 and early 1920, Einstein's renewed activities on behalf of Zionist causes in early 1921 led him to venture for the first time across the Atlantic. In studies of Einstein, the trip has been described as springing directly from his interest in the establishment of the Hebrew University in Jerusalem and is thought to have shaped, to some extent, Einstein's ties with the American scientific community.[1] Historians of Zionism view his participation as a small, albeit interesting footnote to the U.S. campaign of Chaim Weizmann, the London-based president of the Zionist Organisation (ZO) and a distinguished chemist.[2]

There are only few documents in Einstein's hand for the long periods of travel in 1921. But a wealth of hitherto unexamined sources reveals new insights into the American and English tour. We learn that, for Einstein, the trip entailed much personal initiative, and that he mastered a steep learning curve on the politics of Zionism and on Jewish life in the United States. He met many representative figures of a growing and increasingly vibrant American scientific community and had to confront, on an almost daily basis, numerous members of the ever inquisitive international press. His presence no longer can be seen as a mere adornment to a Zionist mission, nor simply as his own impulsive leap for the fulfillment of a pet project. Einstein had his own agenda, which emerged during the tour, namely, to put in place university aid committees in the U.S. and the U.K. that would further the goal of establishing the Hebrew University.

Einstein's voyage was not entirely a surprise. He had earlier explored the possibility of an extended scientific lecture tour. When invited in October 1920 by Princeton University and other prospective academic hosts,[3] and encouraged by Paul Ehrenfest, Einstein had requested the exorbitant fee of $15,000 from each institution. He jokingly speculated that this request would most likely "frighten" off American universities, since in any case he apparently preferred to stay at home.[4] Yet Einstein also had reason to propose such daring terms: he wished to secure the future needs of his two sons and former wife in Zurich by achieving "financial freedom," and was persuaded, as Ehrenfest had argued, that the prestige and status of German science would also be advanced if Einstein were invited by the "2–3 elite universities in America."[5]

In late December 1920, Princeton's president informed Einstein that his university could not afford the honorarium.[6] Wisconsin's dean found the fee "preposterous," and informed both the president of the University of California, Berkeley, and Paul M. Warburg, who was representing Einstein in his negotiations, that "the finances involved are quite beyond the ability of our American institutions to

meet."[7] Warburg's brother, Max M. Warburg, subsequently informed Einstein of the situation (Doc. 43).

In the early weeks of 1921, Einstein appeared relieved not to have to embark on the strenuous tour (Doc. 48). But his plans would change quite dramatically when the German Zionist Kurt Blumenfeld brought Einstein a telegram from Chaim Weizmann, in London, inviting Einstein to accompany him on a Zionist campaign to the U.S.[8]

Weizmann had been planning a visit for more than a year, intending to address the growing discord between European and American Zionists over the Keren Hayesod, the Palestine Foundation Fund. The fund was created by the ZO in London "to bring about the settlement of Palestine by Jews on an orderly plan and in steadily increasing numbers, to enable immigration to begin without delay, and to provide for the economic development of the country to the advantage of its Jewish and its non-Jewish inhabitants alike."[9] Its aim was to raise 25 million pounds sterling. The controversy surrounding the fund centered on the major issues as to who would control the fund, and whether the fund was to be established as a "general donation fund for all Zionist expenditures in Palestine," or whether it was "to be used only for public services, with separate commercial projects."

Louis D. Brandeis, the first American Jew to be appointed as a justice of the U.S. Supreme Court, and a prominent leader of the Zionist Organization of America (ZOA), favored the latter, more "business-like approach" to fund raising, while Weizmann "and his supporters, on the other hand, were focused primarily on the long-term economic and political goals of the Zionist movement." They were particularly devoted to the goals of Jewish immigration to Palestine and rejected the Brandeis faction's business-like approach to fundraising. Therefore, they advocated that control of the Keren Hayesod be centralized in the hands of the Zionist Executive, in contrast to the Brandeis faction, which insisted that each national federation should control the collection and distribution of separate funds.[10] Weizmann's visit meant a possible undermining of Brandeis's standing as a preeminent leader in the ZOA.[11]

According to Blumenfeld, Einstein at first balked at the suggestion, having just rejected invitations to lecture at six U.S. universities that had offered "splendid financial" conditions.[12] Moreover, Einstein was preparing for the upcoming Third Solvay Congress in Physics, to be held only a few weeks hence. As the only German scientist to be invited to this international gathering in Brussels, the first to be convened after the end of World War I, Einstein's participation was of substantial political and symbolic significance. Initially, Einstein, according to Blumenfeld, did not see why the establishment of the Hebrew University would be of such immediate urgency, yet he was apparently swayed by the argument that Weizmann's

invitation should be seen as sufficient reason. Nevertheless, three days after his meeting with Blumenfeld, Einstein was "willing to travel."[13]

Weizmann invited Einstein personally a few days later, the first direct contact between the two men (Doc. 63), and Einstein hastily did his best to reconstruct the canceled scientific lecture tour. He wrote to the president of Princeton that he was "compelled" to travel to America in mid-March on behalf of the Hebrew University. But he also wished to use this opportunity to act on behalf of international reconciliation, a matter "close to his heart" (Doc. 53). He also immediately wrote to Hendrik A. Lorentz (Doc. 57), who had orchestrated Einstein's invitation to the Solvay Congress,[14] and expressed regret for having to withdraw. The refusal was a delicate matter in light of Einstein's long-standing, admiring relationship with his distinguished elder colleague.[15] Scientists from former enemy nations were aware that "[t]he only German invited is Einstein, who is considered for this purpose to be international."[16] To Lorentz, Einstein wrote that decisive meetings concerning the Hebrew University would take place during this American tour. He evinced a continued passion for the Hebrew University project and the envisaged refuge it might offer Eastern European students and academics, with whom he had increasingly come to identify.

Hearing of Einstein's plan, Ehrenfest quickly wrote expressing his delight in the "Jerusalem expedition to Dollardia." While only a few days earlier he had thought that a voyage "just for your pleasure" would tax Einstein's energies (Doc. 68), he now agreed that a successful Jewish university project was a worthwhile endeavor (Doc. 55). Einstein was greatly relieved that Ehrenfest had responded so warmly, but anticipated criticism from others (Doc. 83). He might already have received Fritz Haber's letter (Doc. 87), who upbraided Einstein for traveling with "English supporters" of Zionism, and for visiting the former enemy country "at the invitation of its government," even though Einstein had been invited by universities. Haber was also disturbed that Einstein had chosen to forgo his participation in the soon-to-be-held Solvay Congress. He decried Einstein's decision to travel "at this point in time," when U.S. president Harding had just delayed discussions on ratifying the Versailles Peace Treaty and the British government was tightening its sanctions against Germany. Haber believed that, by repeatedly presenting himself to the press as a Swiss citizen who was residing only "by accident" in Germany, Einstein's actions could be interpreted as a renunciation of the German nation in its current dire straits. He accused Einstein of thereby harming Germany's Jews as well, since the trip would prove the Jews' "disloyalty" to their country. He pleaded with Einstein to delay the trip by a year, and not to place in jeopardy "the narrow ground on which rests the existence of Jewish academic teachers and students at German institutions of higher learning."

Einstein replied the very same day (Doc. 88). He clarified that he had received Weizmann's invitation already a few weeks earlier, prior to the most recent political crises. He was traveling only to lend his name as advertisement in a fund-raising campaign, and reiterated that, despite his internationalist sympathies, he felt compelled to intervene as much as was "in his power" on behalf of his "persecuted and morally oppressed" fellow Jews. He had lately seen "innumerable" instances of "perfidious and loveless" handling of "splendid young Jews" and lamented that officials sought to curtail their educational prospects. He forcefully stressed that his decision was in fact an act of "loyalty" rather than perfidy.

Haber's accusation of "disloyalty" begged for rebuttal: Einstein listed the many invitations to prestigious academic positions he had received from abroad over the years, all of which he had rejected out of allegiance to his colleagues. But Haber's argument of the necessity of showing loyalty to the German state was against his principles as a pacifist, Einstein wrote, and would not sway him. He would not change his plans but agreed to cancel his lecture in Manchester if the murky political situation persisted. As far as the Solvay Congress was concerned, he had forgone participating only "with a heavy heart," even though their colleague Walther Nernst, one of the organizers of the first Solvay Congress in 1911, had been "furious" that Einstein, the only scientist invited from Germany, had agreed to participate.

The emphatic tenor of his reply reveals not only how intensely Einstein identified with the plight of young Jewish academics, but also a palpable frustration at his long-standing friend's rebuke.[17] Recent instances of anti-Semitism against Einstein had increased his Jewish self-awareness: he specifically mentioned to Haber his clash with the anti-relativists at Bad Nauheim, the refusal of Gustav Roethe, secretary of the Prussian Academy, to express solidarity with Einstein against the anti-relativists,[18] and the aversion of fellow academy member Ulrich von Wilamowitz-Moellendorff to sign a petition because Einstein had already signed it.[19]

Einstein also felt the need to placate his longtime friend Maurice Solovine, who was a critic of Zionism (Doc. 93). As to how Zionism, qua nationalism, could be reconciled with internationalism, Einstein wrote that, though not a nationalist himself, he was expecting that Jews would be prevented from the "vanity of power" by the small size and dependency of a Jewish settlement in Palestine. At least outwardly, Einstein was undertaking the tour in the "Zionists'" interest, not in his own, he wrote (Doc. 100).

On 21 March, Einstein and his wife Elsa left Berlin by train for the port of Rotterdam, where they boarded ship two days later. On 24 March, Chaim Weizmann and his wife Vera, together with Menachem Ussishkin, a member of the Zionist

Executive, and Ben-Zion Mossinson, a member of the General Zionist Council and one of the directors of Keren Hayesod, joined the Einsteins in Plymouth on board the TSS *Rotterdam*. Weizmann complied with Blumenfeld's advice, and in his interactions with Einstein during the ten days of passage refrained from attempting to "turn him into a Zionist."[20] It appears that no detailed arrangements had been made concerning Einstein's schedule. It was expected that he "will be prepared to address small but influential private gatherings, or to approach important individuals who are likely at all to sympathise with the cause of the University, provided a list of such individuals is available in time."[21] In a cable from on board ship, Weizmann asked the American Zionist leaders for information on the "arrangements first few days" and "[w]hat are plans for Einstein?" Three days before their arrival, concrete plans had still not been forged. [22] As for Einstein himself, upon arrival in New York he arranged with Princeton University to deliver five lectures there during the second week of May, and hoped to establish further contacts with American scientists (Doc. 115).

On 2 April, the delegation arrived in New York, where it was welcomed by representatives of the mayor's office. As they proceeded uptown in a motorcade through the Lower East Side to the Hotel Commodore, they were greeted by large and enthusiastic Jewish crowds.[23] At a reception by the ZOA held at the Metropolitan Opera House on 10 April, Weizmann delivered a grand speech. Einstein did not speak at all.[24]

Two days later, 20,000 people "turned the … [69th Regiment] Armory into the scene of a near riot." The crowds shouted, waved "Jewish and American flags," and "stormed the police lines." The "demonstration" was organized by "[m]ore than eight hundred Jewish organizations. … It was the people's welcome to their leaders." Here again, following Weizmann's speech, Einstein "made the briefest speech of the evening, when he said: 'Your leader, Dr. Weizmann has spoken, and he has spoken very well for us all. Follow him and you will do well. That is all I have to say.'"[25] But the delegation's visit caused a political dispute within the City Council of New York. The freedom of the city, initially refused, was eventually conferred upon Weizmann and Einstein, over the objections of Alderman Bruce M. Falconer (Doc. 121).

The various parties involved in the American tour had divergent agendas and expectations. Weizmann had wanted Einstein to bolster the fund-raising efforts for the Hebrew University and, to a lesser extent, for the Keren Hayesod. Solomon Ginzberg, secretary of the ZO's University Committee, hoped that Einstein would advocate for the nonideological nature of the university project, heighten its appeal to wealthy non-Zionist Jews, and contribute to the establishment of University Aid

Committees in the U.S. and the U.K. The American Jewish Physicians Committee, just established in New York, intended to utilize Einstein's prestige to raise funds specifically for the medical faculty of the planned university. Given these conflicting designs, widely divergent plans surfaced in regard to Einstein's mission, witnessed by the shifting schedule of talks and meetings that emerges from the correspondence.

After two weeks of "promising" negotiations between Weizmann and the Brandeis faction of the ZOA in the U.S., the talks broke down and a deep rift ensued. On 17 April, Weizmann broke off all further meetings and "proclaimed the establishment of Keren Hayesod in the United States."[26] The breakdown did not have an immediate impact on Einstein's efforts. In mid-April, Brandeis supporter Judah L. Magnes proposed to organize a gathering of intellectuals interested in the Hebrew University, which Einstein agreed to attend only if it were to "contribute to the success of my Mission, to secure support for the Jerusalem University" (Doc. 123), a limitation with which Magnes disagreed (Doc. 124). Einstein attempted to make his decisive push to establish a framework for mobilizing the Jewish non-Zionists on behalf of the university project. He did so by sending a circular letter on 9 May, inviting a number of prominent Jewish personalities to a discussion on the establishment of the Hebrew University on 19 May at the Hotel Commodore (see Doc. 131). The letter, sent to "about 50 non-Zionists," expressed the hope that the meeting would lead to the formation of a University Aid Committee and elect its principal officers.[27] Many prominent figures declined the invitation, some of them declaring their opposition to the entire project. The hardest rejection was presumably that of Paul M. Warburg (Doc. 133), who earlier had acted as a conduit for the negotiations regarding Einstein's lecture tour and who, allegedly, had insisted on Einstein's participation in the Zionist mission (see Docs. 43 and 73).[28]

After having attended a reception at the residence of Harvard University's president on 18 May, Einstein participated in a dinner at the New Century Club in Boston, where $25,000 were raised for the Hebrew University Library.[29] Although Einstein had been invited to lecture on international conciliation at the Harvard Liberal Club, which had been established by Harvard alumni but was not affiliated with the university, there is no indication that the lecture actually took place. Felix Frankfurter, the prominent leader of the ZOA and professor of law at Harvard, wrote Einstein a letter that was both angry and apologetic: he believed that Einstein had been told that Frankfurter was to blame for the fact that Einstein had not been invited to speak at Harvard (Doc. 134). By then, a controversy over a possible visit by Einstein to Harvard had been brewing for six weeks, since Weizmann received

a cable from a Zionist colleague in the U.S., stating that "Harvard absolutely declines Einstein."[30] Whether this was due to rising anti-Semitism or to other local politics or only to news of Einstein's earlier demands regarding fees is unclear.

Toward the end of his U.S. visit, Einstein focused on the planned medical faculty. On 21 May, he attended a reception held by the American Jewish Physicians Committee at the Waldorf-Astoria in New York. During the banquet, attended by 800 Jewish physicians, the fundraising goal was set at $1,000,000, of which $250,000 were subscribed to.[31] A formal agreement was also drawn up, signed by Einstein as well, which laid out the preliminary statutes of the American Jewish Physicians Foundation, to be established for raising funds for the planned medical faculty in Jerusalem.[32]

During the tour, Einstein eventually became somewhat frustrated with his treatment at the hands of the Weizmann camp, who were keeping Einstein mostly in the dark concerning the internal politics and disagreements. His private meeting with Brandeis in Washington, D.C., on 26 April and its aftermath show that fundraising for the Hebrew University, and Einstein himself, had become full-blown political issues in the clash between Weizmann and Brandeis. By alleging to Einstein that Weizmann had misappropriated funds, the Brandeis faction apparently intended to discredit him and inflict major political damage (e.g., Doc. 128).

Einstein's work on behalf of the Hebrew University ultimately was only modestly successful. The enthusiasm he generated among the Jewish professional classes of Eastern European background led to effective fund-raising for the planned medical faculty and for the university's library, although he did not succeed in bringing about the founding of University Aid Committees. These disappointments do not seem to have induced any substantial change in Einstein's devotion to the university project, nor in his basic position on Zionism, which he continued to support. And in spite of his intense interaction with the heads of the ZO, or perhaps because of it, he also continued to maintain his distance from the movement's leadership.

The intense schedule of public and private meetings during the six weeks spent in America led Einstein to some disenchantment with his *Stammesgenossen* (Doc. 141). But he relished seeing the large crowds of American Jews, most of them recent immigrants from Eastern Europe, whom he encountered at meetings and rallies (see Vol. 7, Appendix D, "An Interview with Professor Albert Einstein").

As in volume 10, a small part of the correspondence in this volume reveals how Einstein viewed his Jewish ancestry, as distinct from his activities on behalf of Zionist causes, and his role as a highly visible, prominent Jew. In continuation of his earlier exchanges of 1920 with functionaries of the Berlin Jewish Community regarding his membership dues, Einstein declared in January 1921 that he would

not join the community, defining his Jewishness as residing in a shared nationality and origin, rather than in a religious conviction (Doc. 8). Malvin Warschauer, a Berlin rabbi and Zionist, appealed to Einstein to relent, become a dues-paying member, and thus also strengthen the Zionists within the community (Doc. 74), but Einstein adamantly refused yet again (Doc. 86). In the aftermath, in a letter to the German-Jewish writer Alfred Kerr, Einstein described himself jokingly as Jehova's "unfaithful son" (Doc. 81), while he also saw himself as a "loyal Jew" (Doc. 181), enthusiastic about the ongoing Jewish cultural renaissance both in Germany and the U.S., as when he heartily delighted in a theater performance of the Yiddish "Wilnaer Truppe" in Berlin (Doc. 236).

II

During the month of April and the first half of May 1921, Einstein delivered 17 lectures on the theory of relativity to American audiences.

He had already talked about relativity earlier in the year, in Prague, Vienna, and Dresden. In America, he delivered five lectures at the College of the City of New York (CCNY), two to the Zionist Society of Engineers and Agriculturists in New York, three at the University of Chicago, one at the Chicago Francis W. Parker School, and one at Columbia University. After a brief respite, he proceeded to Princeton and the American Academy of Arts and Sciences in Cambridge, Mass. He declined further invitations to the American Philosophical Society, New York University, the University of Pittsburgh, Yale University, the University of Wisconsin, Howard University in Washington, D.C., Washington University in St. Louis, the University of California, Berkeley, and Canisius College in Buffalo, New York.

On his return to Europe in early June, Einstein spoke about relativity at the University of Manchester and at King's College in London (Vol. 7, Doc. 58), but declined an invitation from the University of Leeds. In late October he gave another three lectures in Bologna and one in Padova. He had been invited to Italy in mid-January, and expected to lecture in his "Sauerkraut-Italienisch," remarking that Dante's descendants would hardly recognize the language as Italian (Docs. 263 and 273). His earlier ambivalence about offers from foreign universities was again visible when he was offered a position in Bologna: he regretted being unable to accept, yet wrote that he would exchange Berlin for Bologna "in a blink" (Doc. 296). An interview with the Italian daily *Il Messagero* is presented (Appendix G) from among a number available for the year.

The Princeton University *Stafford Little Lectures* achieved lasting fame when a contract to publish them with Princeton University Press eventually led Einstein to write what became a well-known and widely read textbook on relativity theory

(*Einstein 1922c* [Vol. 7, Doc. 71]). Contemporary transcripts of notes by auditors are available for the first two, more popular Princeton lectures (Vol. 7, Appendix C). Abstracts for the three more technical lectures in Princeton are presented in this volume (Appendix E), together with auditors' notes for some of his other lectures of the year. Evidence of their content, if not of the actually spoken word, is available for the lectures at CCNY (Appendix C), and for those at the University of Chicago and the Parker School (Appendix D). In America, as elsewhere, Einstein talked about relativity theory in various degrees of technical detail, adjusting content and terminology to the scientific background of his audience. The first CCNY lecture differs from subsequent ones in that Einstein addressed not only relativity theory, but quantum theory as well. At CCNY, he devoted two lectures to special relativity and a third to general relativity, the material in all three corresponding to the two less technical lectures with which he would begin his Princeton series. The fourth lecture at CCNY was in part a discussion of the contention in his Leyden inaugural lecture of 1920, *Ether and the Theory of Relativity* (*Einstein 1920j*) [Vol. 7, Doc. 38]), that the general theory could be construed as an ether theory, albeit one shorn of the objectionable absolute a priori characteristics of the old luminiferous ether, but nevertheless a substantivalist theory to the extent that spacetime itself played a key role in determining the motion of matter. The rest of the fourth lecture was devoted to an analysis of the meaning of electromagnetic radiation in quantum theory, touching on the issues of production and absorption of light as described by the two rival particle (discrete) and wave (continuous) theories of light. This was not only a problem with which Einstein was grappling at this time, but his audience also welcomed it with great interest. Members of the CCNY Research Committee proposed that Einstein publish specifically this last lecture on radiation and quantum theory (Calendar entry of 23 April).

The suggestion was not taken up, nor did Einstein talk about this quantum topic in subsequent lectures. It played no role in any of the three lectures given at the University of Chicago at the invitation of its president, Harry Pratt Judson.[33] Earlier, Carl Beck, a noted Chicago physician, who had been warmly recommended by Felix Ehrenhaft (Doc. 36), had already offered his assistance if and when Einstein were to visit the United States on an academic lecture tour. Einstein expressed the desire to meet the "American world of science," and asked whether Beck could help him meet Chicago physicists (Doc. 115). Prominent among these were Albert A. Michelson, Robert A. Millikan, and Henry G. Gale. Although Michelson, of whom Einstein thought highly (see, e.g., Doc. 103), was traveling in Europe (Docs. 107 and 187), he did meet Millikan, who had returned by then from the just concluded Solvay Congress (Doc. 163).

Einstein spoke at the University of Chicago on the special and general theories of relativity on 3, 4, and 5 May (Appendix D). Even though less technical in character, the relativity material was broadly similar to the subsequent Princeton lectures. In an interesting remark, documented by the transcript of an auditor's stenographic notes, Einstein is reported to have said that an observational confirmation of the relativistic prediction of gravitational light bending is "a task of utmost importance, the solution of which we may hope will soon be achieved by the astronomers." It is unclear whether this was a qualified description of the results of Eddington's 1919 eclipse expedition, or whether the transcript reflects a misunderstanding of Einstein's spoken words by a note taker who was proficient in the German language but may not have had a scientific background. Einstein may have been referring here to a new, upcoming expedition that would test (and eventually provide another confirmation of) the light bending prediction during the eclipse of 21 September 1922 (see Docs. 217, 233, 308, 320, and Calendar entries of 24–27 August). In his lectures at CCNY, Einstein had apparently referred only to the gravitational redshift as not yet being "satisfactorily determined." And, according to a report of his lectures there, he "brought repeated applause from his audience by his generous reference to the British scientists who, in spite of the war, fitted out two costly expeditions to test the truth of his theory" (Appendix C).

A most intriguing remark appears during Einstein's brief explanation of the development of special relativity, found in a transcript of an address he delivered on 4 May at the Parker School in Chicago (Appendix D). Einstein most likely spoke at one of the weekly all-school Morning Exercises that had been held since the school's founding in 1901 by Colonel Francis Wayland Parker, a former superintendent of Chicago's public schools.[33] On this occasion, and perhaps to please the local audience, Einstein stated that, already as a student, he had come across the Michelson-Morley experiment: "But when I was a student I saw that experiments of this kind [i.e., ether drift experiments] had already been done, in particular by your compatriot, Michelson." ("Aber als ich im Studium war, da sah ich, dass Experimente dieser Art schon gemacht worden waren, insbesondere von Ihrem Landsmann, Michelson.") He continued: "He proved that on Earth one does not notice that it moves, but rather that everything on Earth takes place as if the Earth were in a state of rest."

The role played by Michelson's famously null 1887 ether drift experiment in the development of Einstein's thinking on relativity has long been the subject of scholarly debate. Some researchers have even entertained the possibility that in 1905 Einstein had been unaware of the experiment, to which there is no reference in his celebrated paper on the electrodynamics of moving bodies of that year

(*Einstein 1905r*, [Vol. 2, Doc. 23]). In this case as well, when interpreting this statement, one that is in agreement with some pertinent pieces of evidence but in disagreement with others, one remains mindful of the limited reliability of the stenographer's notes.[34]

Einstein's visit was a success with the Chicago physicists. He was even sounded out as to whether he might accept a professorship there, replacing Millikan, who was about to become the director of the Norman Bridge Laboratory of Physics and chairman of the Executive Council of the California Institute of Technology (Doc. 229). Einstein replied that, although tempting, he would have to decline such an offer, given that he had become too "rooted" in Berlin through family and friendships to "choose a completely new, even if attractive, environment." In such a "completely changed milieu," he could not imagine himself capable of the necessary "regeneration" without incurring "significant damage" (Doc. 254).

Einstein delivered some of his most important and best-known lectures on relativity in Princeton. In October 1920, John Hibben, president of Princeton University, already had invited Einstein to such an occasion (Vol. 10, Doc. 160). And even though negotiations had floundered over disagreement concerning the expected honorarium, Einstein immediately wrote to Hibben on 21 February, after having decided to join the fund-raising mission for the Hebrew University (Doc. 53). Acknowledging that Princeton had been the very first university in the U.S. to invite him to lecture (Doc. 139), not counting a 1912 invitation to Columbia University, Einstein offered to give a series of lectures, this time leaving decisions on compensation to Hibben's discretion.[35]

Six hundred invitations were sent out for Einstein's Princeton lectures (see Illustration 12 and Calendar entry of 30 April). Hibben suggested that their stenographic record be later published by Princeton University Press (Doc. 119). Indeed, on 9 May, the day of his first lecture, Einstein signed an agreement with the Press. But instead of allowing the publication of a transcription, he decided to compose an entirely new version himself. By early September, he had barely begun work on the written lectures, a task that took up much of his attention in the following months and led him occasionally to express dismay at his slow progress (see, e.g., Calendar entry of 7 September). By the end of the year, he completed the manuscript. The book was published simultaneously in German, with Vieweg, and in English translation, with Princeton University Press.

Following his trip to the U.S., demand for Einstein's lectures only increased. In late September, he was invited to Japan by the *Kaizo* journal for a month-long tour (Doc. 244), as well as by the writer Kôshin Murobuse for a three months' visit

(Doc. 245). Even though, in a moment of fatigue already early in the year, he had exclaimed that he was "sick and tired of lecturing on relativity theory" (Doc. 12), Einstein responded positively. He thought of traveling to Japan in the fall of 1922 (Doc. 246), yet by early October, displeased with the proposed financial terms, he deemed his counterparts "swindlers" (Doc. 292), and soon thereafter canceled the visit altogether (Doc. 312). By the end of the year, there are hints of a possible trip to South America (Doc. 264), one that Einstein thought would not materialize for more than a year (Doc. 267).

Einstein received many awards during the year. In addition to an honorary doctorate from Princeton University, he became a foreign member of the Royal Society in London, the Bologna Academy of Sciences, and the Swedish Society of Sciences and Arts in Gothenburg. But he did not garner sufficient votes in an election to corresponding membership in the French Academy of Sciences (see Calendar entries of 5 May, 12 December, and 3 November). He declined the opportunity to travel to France on behalf of the Bund "Neues Vaterland," as well as other invitations to lecture in Paris (Doc. 220 and Calendar entry of 30 November). He would eventually speak at the Collège de France the following year.

Even though during 1921 Einstein showed great willingness to accept invitations from abroad, evidenced by his extensive travels, he became more cautious about delivering public lectures within Germany itself. A number of documents in the volume indicate that the previous summer's anti-relativity gathering in the Berlin Philharmonic Hall, and the "Einstein-Debate" with Philipp Lenard at the meeting of the Gesellschaft Deutscher Naturforscher und Ärzte (GDNÄ) in Bad Nauheim, had left their mark on Einstein.[36] He decided not to attend a meeting of the German Physical Society in Jena (Docs. 201, 219, 249), he intended to cancel his participation in next year's GDNÄ conference (Doc. 279), and eventually refused to deliver a seminar in Munich, the city of his youth (Doc. 247).

So as to forestall a renewed attack by anti-relativists in anticipation of the release of Alexander Moszkowski's book based on interviews with Einstein, Hans Reichenbach and Arnold Berliner floated a proposal that Einstein write a review of the literature on relativity, contrasting "friends" and "opponents" (Doc. 28). Einstein declined, declaring that he would not even read Moszkowski's book, and advised that his correspondents do the same (Docs. 27, 37, 97, 153).

Despite Einstein's efforts to tone down controversies about the theory of relativity, public debates persisted. Lenard unearthed an 1801 Newtonian prediction of light deflection in the Sun's gravitational field by Johann von Soldner, and used it to cast doubt on Einstein's estimation of the size of the effect and thus also on the

presumed confirmation by Eddington's team. He also hinted that Soldner's work had been unfairly conflated with relativity theory, in hopes of further tainting its author's achievement (Doc. 308). Einstein seems not to have been much disturbed by these new charges, but appreciated a retort to these assertions published by David Hilbert and Max Born in the *Frankfurter Zeitung* (Doc. 345).

Yet these incipient allegations of plagiarism were to persist long into the future. After the falling-out in 1920 between Einstein and the Borns over media publicity and over Moszkowski's biography,[37] late January and early February 1921 brought a reconciliation with Max Born (Docs. 37 and 47), who even proposed to shepherd into publication an edition of Einstein's collected works (Doc. 338). Toward the end of the year, Hedwig Born, too, extended the "peace pipe" with a postcard written on behalf of the Borns' newborn son, Gustav (Doc. 286), which Einstein accepted (Doc. 345).

Some arguments over relativity theory surfaced in the United States as well. Wesley Wait of Newburgh, N.Y., claimed that he had thought of its central ideas before Einstein.[38] Others aired charges of exaggerated publicity or lack of empirical evidence, or objected to the abolishment of the ether.[39] Charles Francis Brush, an inventor from Cleveland, demonstrated before the American Philosophical Society in Philadelphia a pendulum experiment that purported to exhibit a difference in gravity's pull on equal masses of zinc and bismuth. Reportedly, this alleged refutation of the principle of equivalence drew vigorous applause and received nationwide press coverage. Most articles also mentioned that Arthur Gordon Webster, former president of the American Physical Society and member of the National Academy of Sciences, had been "flabbergasted" by the results.[40]

Ubiquitous and tenacious among Einstein's critics in the U.S. was Arvid Reuterdahl, dean of the engineering and architecture school of the College of St. Thomas in St. Paul, Minnesota. On 9 April, he challenged Einstein to a polemic on relativity, eager to prove that the theory was "bunk."[41] He also claimed that Einstein had plagiarized work written by an author under the pen name "Kinertia."[42] Two days later, when asked about the allegations, Einstein replied to a New York newspaper that he had come to the United States to promote the cause of the Hebrew University, and that he was not interested in engaging in "newspaper discussions with persons who doubt or misunderstand my theories or question my integrity." He had heard neither of "Kinertia," nor of Reuterdahl.[43] The latter nevertheless persisted and soon thereafter published a comparison of Kinertia's and Einstein's texts in Henry Ford's *Dearborn Independent*.[44] By the end of 1921, Reuterdahl had founded the "Academy of Nations," an umbrella organization meant to unite anti-relativists around the world. Some European anti-relativists soon joined, among them Ernst Gehrcke, who became chairman of the society's German chapter.[45]

III

In comparison to the previous year, not only does Einstein's correspondence with members of his family during 1921 decrease considerably, but the tone of the letters exchanged with his sons and former wife appears altered as well, becoming less strained as the year progressed. Whereas in previous volumes tension, anger, and disappointment were often manifest, following a vacation with the boys in southern Germany in fall 1920 (Vol. 10, Doc. 232a, in this volume) Einstein now expressed much praise for them and delight in their company. He was impressed with Hans Albert's development (Doc. 174), and, perhaps musing on his own 42nd birthday, wrote to his confidant Heinrich Zangger, not without a hint of pride, that laziness in correspondence, some intellectual abilities, and a certain defiance were the only assets that had been passed on in his family (Doc. 97).

Early in the year, Hans Albert welcomed the prospect of joining his father on his trip to Bologna, but he worried that Einstein might be too busy and jokingly reproached him for his heavy correspondence (Doc. 110). The sporadic nature of Einstein's visits with the boys in Zurich remained a persistent source of distress, especially for eleven-year-old Eduard. Before Einstein's U.S. trip, he expressed regret to his father that they would not see each other for a long time, even suggesting that Einstein should have foregone the voyage entirely (Doc. 109). At the end of the year he bemoaned the fact that Einstein had never celebrated Christmas with them (Doc. 349).

But in mid-July, the boys did spend a whole month with their father, a summer holiday long hoped for by Einstein. They vacationed for three weeks in the small Baltic seaside resort of Wustrow (Doc. 189), followed by a ten-day visit with Hermann Anschütz-Kaempfe in Kiel. Einstein relished their time together. It was for him an "indescribable joy" (Doc. 249). He thanked Mileva Marić for rearing their sons in a "friendly attitude" toward him. He liked their "lively intelligence," their "happy and modest" ways (Doc. 218), and took much interest in Hans Albert's plans for his education after completing high school (Doc. 260). The summer also offered an opportunity for the boys to meet Einstein's stepdaughters, Ilse and Margot (see Illustrations 20 and 21), who were vacationing in nearby Ahrenshoop (Doc. 214). Later in the year, Einstein traveled with Hans Albert to Italy, and savored time spent there with his sister Maja and her husband Paul Winteler (Docs. 249 and 296). The closeness with his sons also brought about an amelioration in his interactions with Mileva. When she implored him to come to Zurich on his return trip from Italy to Leyden, both for the boys' sake, and because she was hoping to discuss in person issues regarding the sons (Doc. 257), he agreed. By the end of the fall, Einstein felt that as a result of the more frequent meetings, the boys were now "quite attached" to him (Doc. 296).

The palpable improvement in Einstein's relations with Mileva and his sons was also furthered by a considerable alleviation of his financial worries. At the end of 1920, Einstein had still been certain that the family ought to move from Switzerland to southern Germany, where he could more easily provide for them, given the unfavorable currency exchange rates (Vol. 10, Doc. 232a in this volume). Family friends pleaded with him to abandon this plan, contending that it was especially important for Hans Albert to complete his final year of schooling in Zurich (Doc. 17). But by late August 1921, a substantial improvement in his financial situation was brought about by honoraria for public lectures and those of a visiting professor in Leyden (see Doc. 21), by the brisk sale of his books and articles, from his patent opinions and technical work (see. e.g., Doc 82), and from a considerable increase in his annual salary (Calendar entry of 20 October). Einstein and Elsa invested their bonds in the Schweizerische Auer-Aktien-Gesellschaft and $4,300 in the United States via Samuel Untermyer (Doc. 235), a lawyer and civic leader and, given restrictions against the export of foreign currency and the prevailing income tax laws in Germany, were kept informed in coded language about the performance of their holdings (Doc. 272). Einstein was thus able to inform Mileva that the family's financial future in Zurich was now secure. He also urged Hans Albert, who was planning a career in engineering, to remain in close contact with Anschütz-Kaempfe (Doc. 218), with whom Einstein was developing a stronger bond (Doc. 327). Their friendship was strengthened by the two men's scientific and technical collaborations, and by Einstein's delight in visiting Kiel, sailing, and enjoying the luxurious accommodations of Anschütz-Kaempfe's retreat. Einstein's wish for his own summer house was finally realized in 1921, when Elsa purchased a cottage in Spandau, outside Berlin (Doc. 207).

A number of documents in this volume reveal how Einstein dealt with his growing visibility and fame. In March, he reassured his friend Maurice Solovine that the "undeserved" sky-high praise had not corrupted his soul (Doc. 85). Upon returning from his U.S. trip and the accompanying fanfare, he conceded he now had a better understanding of what it means "to be continuously exposed as an official person, to be constantly observed, and have each word weighed" (Doc. 174). Most likely mindful of earlier criticism, Einstein asked that the Vieweg publishing house no longer include his portrait in new printings of *Einstein 1917a* (Doc. 265). And as a result of the unpleasant consequences of his interview with the Dutch daily *Nieuwe Rotterdamsche Courant* (Vol. 7, Appendix D), in whose aftermath Einstein also received an anti-Semitic hate letter encouraging him to emigrate to Jerusalem (Doc. 170), he began to turn down requests for interviews. He also declined to write newspaper articles, since that was against his "sacred principles and habits"

(Doc. 106). Nevertheless, he requested that the editor in chief of the *Berliner Tageblatt*, Theodor Wolff, allow him the final word on the NRC interview, and clarified that some of his semi-jocular remarks about amusing side-effects of the "American intellectual upturn" had not been intended for the public. He was displeased that the *Berliner Tageblatt*, in its rendition of the Dutch interview, had accorded them too much centrality (Doc. 182).

IV

At the beginning of the year, Einstein received a letter inquiring whether he had supported a declaration, published on 2 January 1921 in *Le Matin*, a French newspaper, that had criticized the German authorities' "obfuscating" tactics in the matter of disarmament and that called on France to be on guard and, if necessary, to intervene (Doc. 10).[46] Written by Otto Lehmann-Russbüldt, a leading member of the pacifist organization Bund "Neues Vaterland" to which Einstein also belonged, the article occasioned prompt accusations that, with this declaration, Einstein and other pacifists had committed treason.

The first printed call for Einstein's murder appeared shortly thereafter (see Doc. 32). Although he was in danger of being a target of right-wing extremists at home (Doc. 10), Einstein confirmed his membership in the BNV and, while denying knowledge of Lehmann-Russbüldt's article in *Le Matin*, he too voiced concern with the number of weapons in postwar Germany (Doc. 23).

During 1921, Einstein continuously clarifies his relationship to Germany's domestic and foreign policies, internationalism, pacifist organizations, and left-wing organizations and initiatives. Given the heavy demands placed by the Versailles Treaty on Germany, Einstein commiserated with the hardships endured by Germany's population (Doc. 37) and defended Berlin against criticism (see, e.g., Doc. 97 and Appendix G). Although he had personally confronted growing nationalism, such as that displayed in January by university students during his lecture in Dresden (Doc. 24), he compared current events to the erstwhile imperial nationalist craze ("Nationalfimmel wie einst unterm Willem," Doc. 97), and decried the precarious situation of scholars in the defeated countries (Doc. 111). As he had done even prior to his visit to England, Einstein consistently lauded English scholars, especially the Quakers and pacifists among them, and repeatedly highlighted the English scientists' enthusiastic reception of relativity, and compared it favorably to that of his German colleagues (Docs. 88 and 104).

Under these often tense conditions, Einstein's exchanges with Arnold Sommerfeld during 1921 illustrate the apparent lack of understanding of Einstein's views

and character by some of his colleagues. In July, after Einstein's extremely successful visit to the United Kingdom during which he was seen as bringing about a significant rapprochement between the two countries' scientific and intellectual communities, Sommerfeld asked him to help publish an article in the English press that defended the issuing of the nationalist Lusitania medal during World War I (Doc. 168). In reply, Einstein deplored the fact that Sommerfeld had written the article. He thought that its publication in England was inappropriate, and explained to Sommerfeld that he actually was in favor of informing the German public of the "entire dirty laundry" that had "accumulated during the war" (Doc. 175).

The university in Munich, Einstein wrote to Sommerfeld, was an "anti-Semitic reactionary wasps' nest," and he would refrain from lecturing there because he feared protests by right-wing students (Doc. 247). The invitation extended to Einstein had incited dispute when the University of Munich rector had requested a commitment from student representatives that the visit would not be accompanied by "disgraceful scenes," to which the *deutsch-völkische* students agreed only on condition that Einstein refrain from "political agitation."[47] After hearing about the matter, Einstein no longer felt obliged to honor his commitment. He attempted to soften the force of his refusal by writing to Sommerfeld that he preferred to distance himself from matters that "pointlessly cause human difficulties" (Doc. 247). In November, Anschütz-Kaempfe wrote to him that the harsh characterization of his "militarized" Munich Gymnasium education in an interview in *Le Figaro*—similar to the published remarks in his discussions with Moszkowski[48]—had carried with it negative repercussions in his former hometown. He asked Einstein to write a "mollifying" note to Sommerfeld (Doc. 293), a request to which Einstein apparently acceded (Doc. 327).

In England, Einstein met with high-level British dignitaries, including Prime Minister Lloyd George and the Archbishop of Canterbury, Randall Davidson (Doc. 145). There appears to be no doubt that Einstein (Doc. 152), his hosts (Doc. 159), as well as Berlin officials and the press, were considerably impressed by his reception. Einstein praised the "cultural treasures" of England (Doc. 149) and its "splendid intellectual and political tradition" (Doc. 155), and continued to correspond with his hosts long thereafter. In an interview upon his return to Berlin, Einstein said that the "overwhelming majority" of scientists in America were interested in the reestablishment of international cooperation. His goal had been to promote reconciliation within the international scientific community and to discuss his new scientific theories at prestigious American and English universities (see Doc. 115). He had found that there was an even greater desire for reconciliation in

England than in America, and remarked on the significance of the fact that he had lectured in German in both countries (Appendix F).

Shortly after Einstein's return from abroad, the president of the German Red Cross invited him to speak about his impressions of the trip at the Landeshaus in Berlin (Doc. 156). The meeting was attended by President Ebert and other members of the Reich and Prussian cabinets, and by representatives from the Reichstag, the Berlin administration, universities, and executives from commerce and industry (Doc. 164). The event, widely reported in the German press, gave Einstein unprecedented visibility in the wake of his visits to former enemy countries. Apparently because of the perceived success of his tour, some members of the Jewish community of Berlin became increasingly curious about Einstein. At a "mass rally" on 27 June at the Blüthner-Saal, Einstein was welcomed "with stormy jubilation," while the police outside redirected traffic to bypass the large crowd gathered outside the lecture hall.[49] In early July, the Zionistische Vereinigung für Deutschland also held an event at the Hotel Kaiserhof in Berlin in honor of Einstein's return. In his speech, Einstein reportedly declared that his support for Zionism primarily served the promotion of peace, given that the rejuvenation of Jewish life under Zionist leadership would give new confidence to the friends of world peace.[50]

International reconciliation and pacifism thus seemed to be ever present themes in Einstein's public activities during 1921. The accusations of treason and the call for his assassination (Doc. 32) gave Einstein some pause. He refused to grant an interview with the Berlin correspondent of the *Observer* due to the degree of "testiness" against him in Germany (Doc. 38). Nevertheless, shortly thereafter he participated in a BNV delegation to Amsterdam with Harry Kessler and Otto Lehmann-Russbüldt. They appealed to the International Federation of Trade Unions to intervene with the Allies on behalf of Germany at the Paris Reparations Conference. He described this brief trip to his good friend Paul Ehrenfest, whom he only informed in haste, as devoted to "an adventurous political idea" (Doc. 48). Surprised and concerned, Ehrenfest begged Einstein to be as "quiet as a newborn" in the Netherlands lest he place his Dutch colleagues in an uncomfortable position (Doc. 55). Pacifism and reconciliation were explicit desiderata in all of Einstein's encounters with colleagues abroad. In the United States, too, at least one of Einstein's meetings was on behalf of German pacifists: his meeting with a member of the executive committee of the Carnegie Foundation to discuss the necessity of funding German pacifists, in particular the BNV (Doc. 151).

Einstein supported the mass peace demonstration in Berlin on the occasion of the seventh anniversary of the outbreak of World War I (Doc. 196), at which Elsa

Einstein supervised the sale of the antiwar pamphlet "Nie wieder Krieg!" (see Calendar entry of 13 July), and followed up on Stefan Zweig's suggestion that those who want to be "active in a supranational manner" should meet in person by inviting Anatole France, who had just received the Nobel Prize in literature, to dine in his poorly heated Berlin apartment (Docs. 322 and 325).

During 1921, numerous organizations and leaders of various causes vied for Einstein's attention and support. More generally, the rising influence of Soviet Russia obliged German and European intellectuals to take a stand on the issues of the day, and to clarify the extent of their support for the left. In the prevailing dire social and economic conditions in Germany and much of Europe, many of the initiatives directed at Einstein were related to appeals for relief or cooperation. Among these, Einstein agreed to participate as a collaborator in the Austrian sociologist and philosopher Otto Neurath's project to publish scientific popular books for the general public, especially for the working classes (Docs. 14 and 76). Further, in response to a letter from the distinguished German-American anthropologist Franz Boas, he expressed "deep appreciation" for the work of the Emergency Society in Aid of German and Austrian Science and Art (Docs. 114 and 116), and later collaborated with the German Red Cross to identify needy scholars who would benefit from a newly established American committee to aid scientists and teachers (Docs. 169, 176 and 203). By the end of September, Einstein wrote Zangger that he was now more optimistic with regard to the political situation because economic hardships across the board seemed to have created a form of European solidarity (Doc. 249).

Einstein also tried to be of assistance to scientists from Soviet Russia, a country in the grip of civil war and famine. At Ehrenfest's request, he interceded with the German consul in Reval (Tallinn) to allow Soviet physicists to travel via Germany to the Netherlands (Doc. 71). In January, *Izvestiya* published an open letter by Einstein regarding assistance for the work of his Russian "comrades," addressed to Nikolai Fedorovsky, organizer of the Soviet Bureau for Science and Technology in Berlin (Doc. 33). Yet, in private, Einstein also reacted with sympathy toward the sailors' uprising against the Bolshevik government in Kronstadt (Doc. 97), one that was brutally crushed. He assisted Ehrenfest in arranging for physicist Abram Ioffe to visit the Netherlands (Doc. 148), and was even rumored to be negotiating a lecture tour in Soviet Russia with Anatoly Lunacharsky, the People's Commissar of Popular Enlightenment (Doc. 199). Einstein vehemently denied this gossip (Doc. 207). Although he received several other requests to assist those suffering in Soviet Russia, Einstein signed only the one issued by the Auslandskomitee zur Organisierung der Arbeiterhilfe für die Hungernden in Russland. However, he eventually asked to be removed from its membership list after having been

informed by "a competent (socialist) source" that it was "party-political in character" (Docs. 226, 231, 234). Given Einstein's close ties to high-ranking socialist politicians, such as Konrad Haenisch and Carl H. Becker, he may well have turned to them for an assessment of the various appeals he received in regard to the famine.[51]

V

Overwhelmed by the demands on him, Einstein wrote to an old associate that he was displeased with his hectic life, and that he barely had an opportunity for "reflection." For him, science was "the utmost" ("das Schönste"). Although he mused that his own "inventing on a grand scale" might be over (Doc. 105), by December he exulted that an experiment designed to probe the process of light emitted by canal ray particles, on which he had been working for several months, had given him his "strongest scientific experience in years" (Doc. 345). Despite the lack of uninterrupted time for work, during 1921 he engaged in important theoretical and experimental investigations and published at a steady pace. Otherwise, with some notable exceptions, he confined himself in public and in print mostly to brief statements on political or other issues. He also published a great deal: his lecture to the Prussian Academy of Sciences on "Geometry and Experience," dealing with a broader analysis of the mathematical and physical assumptions and implications of relativity theory (*Einstein 1921c* [Vol. 7, Doc. 52]); and further papers on general relativity (*Einstein 1921e* [Vol. 7, Doc. 54]), on the size of globular star clusters (*Einstein 1921f* [Vol. 7, Doc. 56]), and on a proposed experiment on the nature of light (*Einstein 1922a* [Vol. 7, Doc. 68]). He wrote for the popular press on relativity (*Einstein 1921d* [Vol. 7, Doc. 53]), clarified in print his views on Zionism (*Einstein 1921h* and *Einstein 1921j* [Vol. 7, Docs. 57 and 62]), pacifism (*Einstein 1922b* [Vol. 7, Doc. 69]), and economic deprivations (Vol. 7, Doc. 65, and *Einstein 1921k* [Vol. 7, Doc.70]), and drafted expert opinions on patent disputes (Vol. 7, Docs. 66 and 67).

Einstein's theory of relativity was increasingly becoming part of the public understanding of modern theoretical physics. It also influenced broader philosophical debates on the nature of space and time and on the characteristics of scientific research. While still fully engaged in popularizing what had been accomplished in this area, Einstein still continued to work on unsolved problems associated with the theory.

One of these open questions concerned the role of the electromagnetic field. Like other theoreticians at the time, Einstein believed that a satisfactory physical theory should account for both the gravitational and the electromagnetic field in a

conceptually unified way. In previous years, Einstein had been confronted with two appealing suggestions for a modification of the original framework of general relativity. The first approach was Hermann Weyl's "truly infinitesimal" geometry and the interpretation of the electromagnetic potential in terms of what Weyl called the "length connection" within his generalized geometric theory. Fascinated by Weyl's mathematical ideas, Einstein had soon rejected it as physically untenable on account of his "measuring rod objection." Nevertheless, Weyl's theory was studied as an attractive generalization of Einstein's general theory of relativity, especially when Weyl included discussions of these ideas in the third and fourth editions of his highly acclaimed and widely studied textbook *Space–Time–Matter* (*Weyl 1919*, *1921a*). In correspondence, Einstein singled out two further theories that were based on Weyl's generalized geometry, one by Arthur Stanley Eddington, and another by Rudolf Bach (Docs. 163, 230).

The second approach aimed at a unification of the gravitational and electromagnetic forces had been Theodor Kaluza's.[52] It proposed using a metric of a five-dimensional spacetime that contained the electromagnetic potential in its $g_{5\mu}$-components (the $g_{\mu\nu}$, $\mu, \nu = 1, \ldots, 4$, played their familiar role from relativity). Kaluza showed that this theory's affine connection can be interpreted as containing the electromagnetic field, and that for a linearized metric, the Ricci tensor would yield the linearized field equations for gravity along with the Maxwell equations. Einstein had learned about Kaluza's theory through a manuscript that Kaluza had sent him in 1919. As with Weyl's approach, he was initially fascinated and proposed to submit an article by Kaluza for publication in the proceedings of the Prussian Academy (Vol. 9, Doc. 26). Yet, here as well, Einstein would soon come across a fundamental objection. Kaluza's framework implied the existence of a g_{55}-component whose interpretation was unclear. But one of the consequences of Kaluza's theory is that the g_{55}-component constitutes the leading term in the equation of motion of particles carrying an elementary charge. This implies an influence greater by many orders of magnitude on the motion of the electron than the empirically observed motion would allow for. Einstein considered the objection sufficiently serious to withdraw his offer to communicate the paper, and Kaluza ended up not publishing the work (Vol. 9, Docs. 40 and 48).

Einstein and others hoped to "throw light" on the microscopic, "molecular realm" as well (Doc. 57). One of the main concerns was to overcome the "dualism of field and matter." When assessing the structure of the field equations in the general theory of relativity, Einstein held that the occurrence of the stress-energy tensor was just a phenomenological "stopgap," a consequence of overlooking the true molecular nature of matter (Doc. 318).

Already in 1919, Einstein had published a note in which he considered the question: "Do Gravitational Fields Play an Essential Role in the Structure of the Elementary Particles?" (*Einstein 1919a* [Vol. 7, Doc. 17]). He there proposed a modified gravitational field equation in order to account for the electron's stability, following up on similar ideas about internal stresses of the electron put forward by Henri Poincaré. Occasional remarks in his correspondence suggest that Einstein had continued pondering these questions, but in 1921 he explicitly followed up on these issues by reconsidering both Weyl's theory and Kaluza's idea.

Early in 1921, Einstein had a "fortunate thought" (Doc. 71) concerning Weyl's theory. As he would argue in a note presented to the Academy on 3 March (*Einstein 1921e* [Vol. 7, Doc. 54]), Weyl's theory was based on two fundamental ideas. According to the first, the ratio of metric components is a more fundamental quantity than their absolute values, and, in fact, much of the theory's content is already contained in its conformal structure, given by the light cones $ds^2 = 0$, rather than by its full metric structure, given by the line element $ds^2 = g_{\mu\nu}dx^\mu dx^\nu$. Weyl's second idea then was to generalize Riemannian geometry by postulating the existence of transportable measuring rods, while denying that their length was independent of the path of transport. This was achieved, in Weyl's theory, by means of the new concept of a "length connection" whose coefficients φ_μ were interpreted as expressions of the electromagnetic potential.

Einstein now proposed to keep Weyl's first idea, but do without the second. He asked the Viennese mathematician Wilhelm Wirtinger, whom he had met in Vienna earlier in the year, whether one could find a generalization of the geodesic equation that would only depend on the conformal structure. Wirtinger replied in the affirmative, and showed how an equation of motion could be based on a line element constructed from the Weyl scalar (Docs. 49, 58, 79). An attractive feature of such a theory was that, unlike in Weyl's earlier theory of unified gravity and electromagnetism, there would be only electromagnetic field strengths and no electromagnetic potentials (Docs. 57, 89).[53] Initially, Einstein was "very curious whether these hypotheses will hold up" (Doc. 57), and confident that one could decide readily whether the theory would be physically correct (Docs. 58, 71). But already on 9 March, he wrote to Sommerfeld that he doubted "whether this business is physically worth anything," adding: "The Lord does as He pleases and doesn't follow orders" (Doc. 89). A few weeks later, he lamented a general lack of "physical clues" which Einstein, at that time, believed to be the only possible starting point for "real progress" (Doc. 163).

Einstein also reconsidered Kaluza's five-dimensional unified field theory. As shown by Jakob Grommer (Doc. 283), the objective was to examine whether this

theory might allow for a regular, centrally symmetric solution that could represent the electron. According to Grommer's calculation, it did not.[54] Nonetheless, Einstein deemed Kaluza's theory "truly captivating" (Doc. 318). In his joint investigation with Grommer of the implications of Kaluza's theory, Einstein reconsidered his earlier rejection of Kaluza's manuscript, and now renewed his original offer to communicate a paper by Kaluza to the Prussian Academy (Docs. 270 and 281). He presented a paper by Kaluza on the five-dimensional theory to the Academy on 8 December. The article contained a detailed discussion of the problems that the g_{55}-component caused in the equation of motion of a charged particle, and offered some thoughts on how these may be avoided (*Kaluza 1921*, pp. 970–972; see also Doc. 305). Yet Einstein remained skeptical because, as his work with Grommer had shown, the theory failed to bring about the desired unification of field and matter through a non-singular particle solution.

Theoretical research in general relativity did not only pertain to the exploration of possible generalizations. In late 1921, Einstein was confronted with one of the earliest intimations of the true nature of the Schwarzschild metric, namely, with what is now called a black hole (see Docs. 314 and 302). The French mathematician and politician Paul Painlevé had discovered a new set of coordinates suitable for describing the spacetime of a single point mass, known as the Schwarzschild metric. The behavior of matter in this spacetime appeared to be different from that seen in the usual Schwarzschild coordinates. In particular, an object falling toward what was then seen as a singularity, but is now referred to as the event horizon of the black hole, does not, in Painlevé's coordinates, exhibit the bizarre deformations associated with an approach to this point in space when the Schwarzschild metric is described in the usual coordinates. Painlevé drew the conclusion that such radically different "measurements" of the same event in the same spacetime indicated that there was something dubious about the theory's claims of general covariance. Einstein defended his theory in a spirited fashion against the implication that a theory which predicted apparently contradictory measurements, depending on how the calculation was performed, could not be consistent. However, like others at this time, he did not perceive that Painlevé's coordinate choice suggested anything unphysical about the so-called Schwarzschild singularity.

VI

Einstein's correspondence of the year 1921 provides ample evidence of a remarkable variety of new and ongoing experimental investigations that he either directly suggested, or that he followed with close interest. Not every idea or experimental

investigation that we learn about in his letters produced a published outcome, at least not by the end of the period covered by this volume. In fact, for most of these experiments, we have very little evidence about the extent of their execution, outcome, or interpretation.

A notable exception is an experiment aimed at deciding between the fundamentally different accounts that the wave theory and the quantum theory of light gave of the elementary process of light emission for light-radiating canal ray particles. This experiment was suggested by Einstein in a short note published in the Prussian Academy's proceedings (Vol. 7, Doc. 68). It is the only experiment mentioned in publications for 1921, yet it was only one among many in which Einstein took a keen interest during the year.

Indeed, in his first letter of the year, on 1 January, to Hendrik A. Lorentz (Doc. 3), Einstein mentioned two new experiments: one that he intended to pursue in Berlin, and another that he was proposing to his colleagues in Leyden. The latter concerned the existence and properties of the Hall effect in superconductors. Einstein sketched an argument that discusses properties of Maxwell's equations for the case of infinite conductivity. He then specialized to an experimental setup that would allow an investigation of the predicted properties.[55] Later in the year, he proposed another experiment on superconductivity, also to be carried out in Heike Kamerlingh Onnes's cryogenic laboratory in Leyden. In a letter to Ehrenfest on 2 September, Einstein referred to their earlier discussions on the subject, and expounded an idea of superconductive electric charge transport that takes place with electrons moving from atom to atom, in a snakelike motion, via multiple travels around osculating Bohrian orbits (Doc. 225). This idea had been discussed with Ehrenfest and other Leyden physicists during Einstein's visit on the occasion of the "Magnet-Woche" in November 1920. An immediate consequence of the idea, Einstein now pointed out, is that superconductive currents have a minimum threshold value determined by the Bohr quantum conditions for the allowed electron orbits. He suggested that one should test the idea by checking whether a superconducting loop would be responsive to inductive currents in a neighboring normal conductor only above a certain threshold value.[56]

The other experiment that Einstein mentioned to Lorentz was an investigation that he himself wanted to carry out in Berlin in collaboration with the experimental physicist Peter Pringsheim. Like the experiments on superconductivity, it, too, targeted properties of the emerging quantum theory. Boldly referring to it three days later as an "experimentum crucis," Einstein designed it to decide whether the wave theory of light correctly predicts the thermodynamic black-body spectrum (Docs. 6, 24, and 37). The point was to look for the induced Stark effect for the

atoms' light emission in a thermal radiation bath. But there is no extant explicit account of Einstein's project, nor of its execution.

Another investigation into experimental evidence for implications of the emerging quantum theory is mentioned in a letter to Ehrenfest of 1 September (Doc. 219), in which Einstein mentions a joint investigation with Grommer into existing experimental data that would decide whether helium shows any evidence of a zero-point energy.

During 1921, accumulating evidence suggested that Einstein's and Wander J. de Haas's initial work on the gyromagnetic effect was beset by a factor-of-two problem. The initial agreement between theory and experiment could not be reproduced. The factor-of-two discrepancy would eventually be satisfactorily accounted for only a few years later, after the discovery of the electron's spin. In June 1920, Einstein had accepted an invitation to present a review of the problem at the 1921 Solvay conference (Vol. 10, Doc. 56), and in December 1920, he corresponded with De Haas on the available experimental literature (Vol. 10, Doc. 215). Although Einstein withdrew from the Solvay conference due to his trip to America, and asked De Haas to speak on his behalf, he nevertheless kept up an interest in the issue. When the Hamburg experimentalist Johannes Classen wrote Einstein about his own measurements of the gyromagnetic effect (see Calendar entry of 3 February), Einstein remained skeptical as to their conclusiveness, and recommended "great caution" in their interpretation (Doc. 50; see also Doc. 57). Similarly, he corresponded with Sommerfeld about experiments and an interpretation of the factor-of-two problem that the Munich-based physicist Karl Herzfeld had proposed (Docs. 89, 98, 168, and 175). But, again, Einstein rejected the alternative interpretation: "The devilry is rooted deeper down" (Doc. 175).

While the aforementioned experiments all deal in one way or another with problems associated with quantum theory, Einstein also engaged a former correspondent in discussions concerning experiments relating to the theory of relativity. Ludwik Silberstein, whom Einstein met in person in Princeton in May 1921, joined the faculty at Chicago for a term later that summer (Doc. 178). Silberstein had inspired Michelson—the "master," according to Einstein (Doc. 136)—to again take up an experiment on ether drag: according to relativity, and the hypothesis of a stationary ether, the Earth's rotation implies that a phase difference was to occur between light traveling in opposite directions along a closed triangular trajectory. Although Michelson had proposed such an experiment already in 1904, Einstein was excited about this new test about whose progress Silberstein kept him informed throughout the year (Docs. 187, 197, 229, 320). Silberstein further wrote Einstein

of a consequence of relativity that contradicted the observed behavior of double stars (Docs. 178, 187), but he soon realized that the argument was erroneous (Doc. 197, 229).[57] While still in Princeton, Einstein had learned about preliminary experiments undertaken at Mount Wilson by Dayton C. Miller of Case Institute who claimed to have found a non-zero ether drift. As overheard by Oswald Veblen, Einstein is said to have responded: "Subtle is the Lord, but malicious He is not" ("Raffiniert ist der Herrgott, aber boshaft ist er nicht," see Calendar entry of 9 May).

Similarly, Einstein followed with great interest the progress in observational attempts to verify the prediction of relativistic gravitational redshift. His satisfaction at the favorable verdicts issued by a string of Continental European experimenters, expressed to his friend Besso (Doc. 141), was perhaps heightened by the increasing likelihood that the previously skeptical community of astronomers in Britain and America were coming around to his way of thinking. The American public and scientists showed keen interest in the gravitational redshift, the only one of the theory's three tests that had not yet been experimentally confirmed. Solar spectroscopists still doubted whether the predicted effect was consistently present in their data. The tide, already perceived by Einstein to be turning in 1920 (see, e.g., Vol. 10, Docs. 76 and 98), began to come in more strongly in favor of relativity during 1921. The *New York Times* reported on 8 September that astronomers in America were now expecting the theory to be confirmed by the latest work of the previously skeptical Charles Everard St. John. Einstein himself wrote to Eddington in November (Doc. 295) to tell of rumors that St. John's as-yet-unpublished work showed strong signs of confirming his theory, given that rival proposals had been eliminated one-by-one.[58]

The year 1921 also witnessed a falling out between Einstein and his long-term collaborator, the Berlin astronomer Erwin Freundlich. They had begun corresponding in the fall of 1911, and since then had continuously explored possible observational tests of the emerging relativistic theory of gravitation by investigating gravitational light bending in starlight grazing the limb of the Sun or Jupiter or by stellar gravitational lensing. They also collaborated on the detection of the predicted gravitational redshift. Freundlich had been the first professional astronomer to show sustained enthusiasm for such tests.[59] During 1920, Freundlich was one of the main engines behind the establishment of the Einstein Donation Fund that eventually supported the construction of the famed Einstein Tower Telescope, inaugurated in summer 1921 during the annual Astronomical Society's meeting in Potsdam (see Illustration 22). In June 1921 we find both scientists as friendly

colleagues in London during their visit at Lord Haldane's home, engaged in a long discussion with the British mathematician-philosopher Alfred North Whitehead.[60] But Freundlich's work had earlier been criticized by astronomer colleagues, and Einstein jokingly speculated in a letter to Ehrenfest that the Leiden colleagues probably "pinched" Freundlich a bit during the latter's visit, something that would "do him only good" (see Doc. 152 and its notes). They co-signed petitions to the Astronomische Gesellschaft requesting support for empirical tests of the predicted planetary perihelion advance, and for the planned expedition to test gravitational light bending during the eclipse of 21 September 1922 (Docs. 216, 217). At Freundlich's urging, Einstein intervened in September with officials in the Prussian ministry of education in the matter of appointments at the Potsdam Observatory, but tension was already palpable, as when he reminded Freundlich that the goodwill extended to relativity research in Berlin was essentially due to the services rendered to this subject by British colleagues (see Docs. 221, 233, 248, 331, and Calendar entry of 31 August).

The estrangement between Einstein and Freundlich eventually erupted into open disagreement in late December 1921. It concerned an Einstein manuscript.

It appears that Einstein had given Freundlich for fund-raising purposes the manuscript of *Einstein 1916e* (Vol. 6, Doc. 30), now part of the Schwadron collection at the National Library of Israel. Later in the summer of 1921, Einstein asked for the return of the manuscript. Freundlich did not comply, despite repeated interventions, also by Elsa Einstein (Doc. 331). By the end of September, Einstein began to openly voice reservations about Freundlich's interference in an appointment matter at the Potsdam observatory (Doc. 248), and by 20 December he wrote a stern letter, demanding again the return of the relativity manuscript (Doc. 330). He accused Freundlich of misappropriating the manuscript and even of trying to sell it abroad, behind Einstein's back. Despite the efforts of Arnold Berliner and others to mediate between the two former colleagues (Docs. 337, 339), by the end of the year Einstein submitted his resignation from the board of the Einstein Donation Fund because of "an irreparable discord" with Freundlich (Doc. 340).

Einstein's contribution to experimental work was not restricted to investigations that directly pertained to his own research interests. From his correspondence with Felix Ehrenhaft (Doc. 36), with whom he visited earlier in the year in Vienna, we learn that he suggested detailed modifications of the latter's experiments. He also worked with Walther Nernst on the technical problem of making a freezing device ("Eismaschine," see Docs. 195, 219) and engaged in practical experiments undertaken in the company owned by Anschütz-Kaempfe (see Docs. 293, 92, 237, 241, 263, 290, 309, 327).

But among all these experiments, the one that gave Einstein his "strongest scientific experience in years," as he wrote to the Borns on 30 December (Doc. 345), was the one designed to probe the process of light emission by canal ray particles. The first mention of such an experiment is found in a letter to Born of 22 August (Doc. 211), followed only six days later by a report that Einstein had already begun its execution at the Physikalisch-Technische Reichsanstalt (Doc. 218). His experimental collaborator there was Hans Geiger; they were later joined by Walther Bothe.[61]

Einstein's interest in light quanta dated back to his earliest publications, most notably to his heuristic introduction of the concept in 1905 (*Einstein 1905i* [Vol. 2, Doc. 14]). In the following years, his analysis of energy fluctuations for Planck's distribution law supported it (*Einstein 1909b*, *1909c* [Vol. 56, Docs. 56, 60]), and observations by Millikan in 1916 confirmed Einstein's relation between energy and emitted frequency for the photoelectric effect, although the theoretical interpretation of Millikan's experiments remained controversial. The same year, following his result of the directional nature of quantum emission, Einstein concluded that "there is no emission of radiation in the form of spherical waves."[62] In 1921, the light quantum was still controversial among many of Einstein's colleagues. At the Solvay conference that summer, Niels Bohr in his paper stated that Einstein's quantum presented "difficulties that appear insurmountable": the hypothesis still stood in conflict with the familiar interference phenomena of light.[63]

In order to probe the nature of the light emission process, Einstein proposed an experimental arrangement with canal ray light sources. According to the wave picture account of the emission process, light emitted would be subject to the Doppler effect, with its familiar angular dependency for the frequency. Einstein believed that quantum theory, too, would allow for the existence of a Doppler effect (whose existence had been demonstrated for canal ray sources by Johannes Stark as early as 1905, see Doc. 261), yet, he expected that the Doppler shift in a quantum emission process would give very different dispersive properties of light.[64]

To test the different perspectives, Einstein proposed to collect light emitted into the angle of the aperture of a lens and to focus it onto a slit, and then project the emitted light rays into a parallel bundle by a secondary lens. If the light rays entering the optical setup were to display a Doppler shift as predicted on the basis of the wave picture, there would have to be coherent phase fronts that showed a position-dependent frequency shift. The idea of the experiment was to test this scenario by sending the parallel light bundle through a dispersive medium with a frequency-dependent diffractive index. Upon traversing such a dispersive medium, Einstein argued, a bundle of light rays with variable frequency would be bent away from a

straight line by an angle that he calculated to be easily observable. In a quantum scenario, however, Einstein thought that this bending would not take place (*Einstein 1922a* [Vol. 7, Doc. 68]).

Einstein was excited about the project, sometimes modestly referring to it as "interesting" (Docs. 230, 247, 275), but also expressing great curiosity in its outcome: "I am very curious about the outcome of our canal-ray experiment. My expectations are totally uncertain" (Doc. 261). In fact, we learn from a letter by Lorentz (Doc. 298) that Einstein was entertaining ideas about a possible theory of emission and propagation of light that would integrate the assumption of "a kind of spherical wave" with "the directed energetic process" of quantum theory (Doc. 261). Lorentz's letter suggests that Einstein may have thought of the spherical radiation field as an "interference radiation," prescribing the probability of where the "energy radiation"—the indivisible, individual quanta—would hit a spot on a screen placed in the path of the radiation. The interference radiation field would produce a probability distribution whereby the quanta would build up an interference pattern. However, Lorentz pointed out that such an interpretation would imply that, according to both Maxwellian electrodynamics and to the new wave-plus-quantum perspective, Einstein's setup would exhibit a deflection in the dispersive medium (Doc. 298). Thus, the experiment would not be able to decide the question for which it had been designed.

Einstein remained undeterred by Lorentz's argument, convinced that only the classical theory predicts the deflection of canal ray light in the dispersive medium. He still believed that the quantum picture of emission could be confirmed by the absence of a deflection in this arrangement (see, e.g., Doc. 326).

Geiger informed Einstein of the first set of preliminary and uncertain results in early November (Doc. 289), but soon fell ill with an ulcer (Doc. 303). His technical mechanic, too, became sick, and further delays ensued (Docs. 316, 326). By mid-December, Einstein, who had already submitted a paper outlining the experiment and its implications to the Prussian Academy (*Einstein 1922a* [Vol.7, Doc. 68]), still could not present any experimental results. But a week later they were in: no deflection had been observed.[65] Classical theory, it seemed, had been dealt a severe blow. The wave field, Einstein believed, had been shown to have "no real existence," and the emission of a quantum, a process that in terms of its energy Einstein thought to be strictly governed by Bohr's quantum condition, had to be considered to take place instantaneously (Doc. 345).

A week before Einstein learned of the definitive outcome of the experiment, he wrote Hermann Weyl that if the experiment were negative, i.e., if it did not exhibit any deflection, then "the field theory is in principle inadmissible" (Doc. 326). By

22 December, he reported to Weyl that the "canal-ray experiment had a negative outcome, which ultimately means a refutation of the field theory of electricity" (Doc. 336). Einstein's perplexity upon learning this news arose from his firm belief, at that time, that the experimental design would, in fact, provide a clear empirical decision between the two fundamentally opposite conceptions. It also bears evidence to his belief in the possible significance of empirical data for the solution of foundational questions. Faced with what he perceived to be an experimental decision about classical field theory, he closed his postcard to Weyl with the words: "Now what?"

[1]See, e.g., *Clark 1971*, pp. 382–392; *Fölsing 1997*, pp. 494–509; *Frank 1953*, pp. 176–187; *Hermann 1994*, pp. 261–266; *Isaacson 2007*, pp. 289–301. For an annotated edition of newspaper reports of the tour, see *Illy 2006*.

[2]See, e.g., *Adelson 1978*; *Barnard 1974*, pp. 269–283; *Berlin 1970*; *Halpern 1987*, pp. 221–232; *Panitz 1978*, pp. 77–94; *Reinharz 1993*, pp. 346–348 and 363–364; *Rose 1986*, pp. 206–213; *Weizmann 1949*, pp. 265–269; *Urofsky 1974*.

[3]See Luther P. Eisenhart to Einstein, 1 October 1920 (Vol. 10, Doc. 160), and Albert G. Schmedeman to Einstein, 30 October 1920 (Vol. 10, Calendar).

[4]Einstein to Paul Ehrenfest, 26 November 1920 (Vol. 10, Doc. 209).

[5]See Paul Ehrenfest to Einstein, 7 November 1920 (Vol. 10, Doc. 191), and Einstein to Paul Ehrenfest, 26 November 1920 (Vol. 10, Doc. 209).

[6]See John G. Hibben to Einstein, 24 December 1920 (Vol. 10, Doc. 243).

[7]Charles S. Slichter to A. L. Barrows, 12 January 1921, and Charles S. Slichter to Paul M. Warburg, 31 January 1921 (University of Wisconsin Madison Archives, Dean Slichter Papers).

[8]See Chaim Weizmann to Kurt Blumenfeld, 16 February 1921 [33 345].

[9]"Keren Hayesod Manifesto-1920, London," *The Jewish Chronicle*, 24 December 1920.

[10]*Wasserstein 1977a*, pp. xiii–xiv.

[11]*Lipstadt 1978*, p. 55.

[12]The other three U.S. institutions were Columbia, Yale, and the National Research Council (see also Einstein to Fritz Haber, 6 October 1920 [Vol. 10, Doc. 162]; Einstein to Max Warburg, 8 December 1920 [Vol. 10, Doc. 223]).

[13]"Einstein bereit, mit Ihnen Amerika reisen Brief folgt." Kurt Blumenfeld to Chaim Weizmann, 19 February 1921 (Weizmann Archives, Weizmann Institute).

[14]For Lorentz's official invitation as president of the congress's International Scientific Committee, see Hendrik A. Lorentz to Einstein, 9 June 1920 (Vol. 10, Doc. 49).

[15]On the relationship between Einstein and Lorentz, see *Kox 1993*.

[16]See, e.g., Ernest Rutherford to Bertram B. Boltwood, 28 February 1921, *Badash 1969*, p. 342. Even though Einstein himself repeatedly claimed to hold Swiss citizenship, the Berlin Education Ministry and the Academy of Sciences eventually concluded that Einstein had become a Prussian citizen upon his employment there in 1913/1914. For the published versions of the relevant documents, see *Kirsten and Treder 1979a*, pp. 112–120.

[17]For the relationship between Einstein and Haber, and their differing views on Germans and Jews, see *Stern 1999*, ch. 3.

[18]See Vol. 10, Introduction, sec. II. Einstein was probably displeased with Roethe's position in regard to the issue of whether the Academy should take an open stance on Einstein's public dispute with the anti-relativity movement. Roethe had informed Planck that he was opposed to the Academy publicly expressing its support for Einstein (see Gustav Roethe to Max Planck, 10 September 1920 [GyBAW-LA, Hist. Abt. II. Tit. Personalia II-III, 38, Fo. 80]).