

Moreover, the commitments of her mate drained both personal and family resources, and damaged their relationship. Significantly, Emily's most explicit contributions to scientific work, preserving Charles's scientific legacy after his death and winning her brother's support for his career, fell well within the role of wife.

Initially, the similar experiences and passion for science that Charles and Emily shared must have figured in their mutual attraction. It seems more likely that they expected to strengthen each other in science than that Emily consented to give it up. Yet the success story was ultimately to be Charles's alone. The few surviving references to Emily are largely negative. Neither Charles nor his biographers mention Emily's scientific background. This remarkable omission mirrors Emily's feeling of lost identity. It was a casualty of the Whitmans' bitter failure to wed intimate and professional life.

JOHN STACHEL

*Albert Einstein and Mileva Marić**A Collaboration That Failed to Develop*

On December 28, 1901, twenty-one-year-old Albert Einstein assured his fiancée Mileva Marić:¹ "When you're my dear little wife, we'll diligently work on science together so we don't become old philistines, right? My sister seemed so crass to me. You'd better not get that way—it would be terrible."² Yet, in almost two decades together,³ during which he became a leading theoretical physicist and published dozens of papers,⁴ he never acknowledged her help in any of them, nor did she publish anything of her own. What went wrong?

It has been suggested that Marić actually made major contributions, perhaps even doing the preponderance of the work in some cases, to important papers published in Einstein's name, contributions that he simply failed to acknowledge.⁵

The available evidence does not support such claims, as I have argued elsewhere⁶ and will argue here. A sketch of Marić's life up to her separation from Einstein,⁷ with emphasis on a discussion of her work in physics and its relation to his,⁸ leads to the conclusion that she played a small but significant supporting role in his early work, a role that later diminished to the point that she felt excluded from his career. Finally, I shall consider some possible reasons why a full collaboration between them never developed.

Marić's Student Years

Mileva Marić was born in 1875 to a mother of Montenegrin extraction, in Titel, a town in the Vojvodina, then part of the Austro-Hungarian Empire. Her Serb father was a middle-level official in the Hungarian bureaucracy, who saw to it that she received an education quite unusual for a young woman of that time and place, including two years as a private

pupil at the Royal Gymnasium in Zagreb, where her father was then working. After receiving special permission to attend the otherwise all-male physics class, she got the highest grades in both physics and mathematics. She finished her secondary education in Zurich, graduating from a girls' school in 1896. After a semester of medical studies at the University of Zurich, she transferred to the Swiss Federal Polytechnical School, Poly for short, enrolling in Section VIA, which trained teachers of mathematics and physics.

Marić's move to Switzerland is not hard to understand. French universities were the first in Europe to admit women.⁹ Switzerland was second with Zurich in 1865, and other Swiss universities soon followed. The Poly did so in 1876, and the first woman graduated from Section VIA in 1894.¹⁰ Young women in search of a higher education, many of them Slavs, went to Paris if comfortable with French, like Marie Skłodowska, or Switzerland if more at home in German, like Rosa Luxemburg.¹¹ Russians and South Slavs from the Austro-Hungarian Empire flocked to Switzerland.¹²

Einstein and Marić were the only two physics students to enter Section VIA in 1896. Both took basically the same required courses, but rather different electives.¹³ During her second year, she went to Heidelberg to attend mathematics and physics lectures, returning after one term.¹⁴ As a result, she passed the Poly's intermediate examinations a year later than he did, using his physics lecture notes to help prepare.¹⁵

After her return, the two became very closely attached, spending most of their time together. In spite of the firm opposition of his parents to the liaison¹⁶—an opposition that led to dramatic clashes between Einstein and his parents—the two lovers resolved to live together after graduation, marrying as soon as economic circumstances permitted. Their relationship included more than romance; to supplement the meager offerings of the Poly in theoretical physics, they jointly studied many classic works.¹⁷ They also spent a great deal of time working in the well-equipped laboratories of Heinrich Friedrich Weber, senior of the two professors of physics.

In 1900 both took the final examinations. Her physics grades were comparable to his, but she got a decidedly lower grade in mathematics; he passed with an average of 4.91 out of a possible 6, while she failed with an average of 4.0.¹⁸ Still hopeful, she reregistered the next year to retake the final examinations.

Both saw Weber as their potential mentor in the process of gaining entry to the physics community. She continued to work in Weber's laboratory on her diploma thesis (see below), which she hoped to use as the basis for an eventual doctorate.¹⁹ Einstein also expected to remain at the Poly as Weber's *Assistent* (the lowest rung on the European academic ladder) while working on a doctorate. But his failure to obtain this position, which he felt had been more or less promised to him by Weber, led to increasing friction between Weber and the young couple.²⁰ Einstein's efforts to get an assistantship in mathematics at the Poly and at numerous

other universities also failed, and he and Marić tried to find other jobs, again without success.²¹ For the next couple of years, he lived from hand to mouth, working at a series of temporary academic and tutoring jobs outside Zurich.

In the midst of this trying period, while studying to retake the final examinations, Marić became pregnant. After again failing,²² she left for home vowing never again to work with Weber. It is quite likely that the friction over Einstein played a role in her estrangement from Weber. Cut off from the physics community, she was now entirely dependent on her relationship with Einstein for intellectual as well as emotional support. He, on the other hand, had found another mentor, Alfred Kleiner, professor of physics at Zurich University, and begun work on a doctoral thesis.²³

During the remainder of her pregnancy, the couple were reunited only once. After his parents sent a letter to hers making their hostility painfully clear, Marić fled the ensuing crisis to be near Einstein, who was working as a substitute teacher. To preserve the proprieties, she stayed in a nearby town for a few weeks, meeting him only on weekends, and then returned home. Her letters to Albert during this period sound notes of real despair, while his reassure her of his devotion and depict a rosy future (see the opening quotation of this paper) once this difficult period in their lives has passed.

Their daughter, referred to as "Lieserl" in Einstein's letters, was born early in 1902.²⁴ The same year, Einstein moved to Bern to start work at the Swiss Patent Office, where he remained for seven years. Marić soon followed, but without Lieserl, and the couple married early in 1903.²⁵ It was not uncommon at the time to legitimize a birth by a subsequent marriage,²⁶ and Einstein had earlier resolved that the child would join them after theirs.²⁷ But Lieserl was never reunited with her parents, and, in spite of recent efforts to find more information, her ultimate fate remains unknown (see below).

The episode undoubtedly placed a great strain on their relationship, as their elder son, Hans Albert, seems to have later surmised. A biographer with unique access to information from him²⁸ reports:

Friends had noticed a change in Mileva's attitude and thought the romance might be doomed. Something had happened between the two, but Mileva would only say that it was "intensely personal." Whatever it was, she brooded about it and Albert seemed to be in some way responsible. Friends encouraged Mileva to talk about her problem and get it out in the open. She insisted that it was too personal and kept it a secret all her life. . . . Mileva married Albert despite the incident. . . . She did not think of the shadow her "experience" would cast over their life together.²⁹

Married Life

"All happy families resemble one another, but each unhappy family is unhappy in its own way," wrote Tolstoy,³⁰ and so it came to be for the Einsteins. At first things went well for the newly married pair—at least in the picture both painted for their friends. Einstein wrote to his friend Michele Besso: "Well, now I'm an honorably married man, and lead a very nice, comfortable life with my wife. She takes care of everything exceptionally well, cooks well, and is always cheerful."³¹ Shortly after, Marić wrote to her friend Helene Savić in a similar vein: "I am, if possible, even more attached to my dear treasure than I already was in the Zurich days. He is my only companion and society and I am happiest when he is beside me." She also inquired about the possibility of teaching jobs for her and Einstein in Belgrade, her last known reference to the possibility of a career for herself.³²

In September 1903, while she was visiting her parents, Einstein wrote: "Now come back to me soon. 3½ weeks have already passed and a good little wife shouldn't leave her husband alone any longer. Things don't look nearly as bad at home as you think. You'll be able to clean up in short order."³³ Marić presumably went to her parents to see to Lieserl's future, which Einstein discussed (the last known reference to her) in a way that suggests they had already decided not to keep her ("As what is the child registered? We must take precautions that problems don't arise for her later"). He mentioned a serious illness ("I'm very sorry about what has befallen Lieserl. It's so easy to suffer lasting effects from scarlet fever. If only this will pass"), and she may have died subsequently; but the reference to her future suggests that she survived. If so, she may have suffered permanent mental or physical damage and been placed in some institution. If she survived unharmed, she may have been adopted by a relative, or given up for a "normal" adoption.³⁴

Einstein had apparently just learned about Marić's second pregnancy: "I'm not the least bit angry that poor Dollie [his nickname for Marić] is hatching a new chick. In fact, I'm happy about it and had already given some thought to whether I shouldn't see to it that you get a new Lieserl."³⁵ But there never was a "new Lieserl." The second child was a boy, Hans Albert, born in 1904; another son, Eduard, was born in 1910.

During his seven years as patent clerk, especially from 1905 on, Einstein produced a steady stream of scientific papers, which, by the end of the decade, gained him a reputation as one of the most promising young theoretical physicists. He left the Patent Office in 1909 to take his first full-time academic post, as an assistant professor at the University of Zurich. By this time the marriage was in trouble. Marić confided to Savić: "In mid-October on the 14th we leave Bern, where I have now spent 7 years, so many beautiful and, I must say, also bitter and difficult days."³⁶

We have seen one source of her bitterness: the final decision about

Lieserl, taken early in the Bern years. Another source was quite recent: a marital crisis, involving Einstein's friend, Anna Meyer-Schmid.³⁷ Suspecting her of designs on Albert, Marić wrote Meyer-Schmid's husband. Enraged, Einstein wrote Herr Schmid attributing Marić's conduct to unmotivated jealousy.³⁸

Marić's letter to Savić goes on to boast of Einstein's success: "He is now counted among the leading German-speaking physicists and is being frightfully courted. I am very happy about his success, which he has really earned; I only hope and wish that fame does not exert a detrimental influence on his human side."³⁹ A letter written to Savić soon after Einstein and Marić settled in Zurich further explains her fears:

You see, with such fame, not much time remains for his wife. I read a certain maliciousness between the lines when you wrote that I must be jealous of science, but what can one do, the pearls are given to one, to the other the case. . . . I often ask myself . . . whether I am not rather a person who feels a great deal and passionately, fights a great deal and also suffers because of that; and out of pride or perhaps shyness puts on a haughty and superior air until he himself believes it to be genuine. And I must ask you, even if the latter were the case, and my innermost soul stood less proudly, even then could you love me? You see I am very starved for love and would be so overjoyed to hear a yes, that I almost believe wicked science is guilty, and I gladly accept the laughter over it.⁴⁰

Einstein's academic star rose with dramatic speed: In 1911 he accepted a full professorship at the German University in Prague, and the next year was called back to a similar post at his alma mater in Zurich.⁴¹ In 1914 he was named a member of the Prussian Academy of Sciences and head of the prestigious Kaiser Wilhelm Institute for Physics, moving to Berlin to take this full-time research job. A letter to Savić in 1911 gives further insight into Marić's feelings during this period:

I . . . believe we women cling much longer to the memory of that remarkable period called youth, and involuntarily would like things always to remain that way. Don't you find that to be so; men always accommodate themselves better to the present moment. Things are going well for mine; he works very hard, gives courses that are very well liked and attended, as well as many lectures, which I never fail to attend. Since there are rather many musical occasions in our house, we really have very little time that we can pass together in privacy and tranquillity.⁴²

These touching and remarkably frank letters depict a woman who feels she is losing her husband, not least because of his successful career in science. They convey a growing sense of exclusion from that career, but no sense of deprivation of credit for his scientific work. Her own earlier ambitions seem completely subsumed by ambitions for him, ambitions that go hand in hand with forebodings of what his success augurs for their relationship.

The toll on Marić became apparent to those around her. Referring to the period around 1912, Peter Michelmores gives us an insight into how things appeared to their son, Hans Albert:

Close friends . . . worried because [Marić's] dark moods were becoming more frequent. She was far too introverted. She never talked about herself. Even alone with the family, she had little to say and her long periods of silence irritated Albert. If they ever discussed the root of the trouble, that mysterious pre-marital incident, nobody knew about it.

Hans Albert, then an eight-year old with a distinct mind of his own, sensed the tension between his parents. But his father's personality assured him all would be well.⁴³

In retrospect, Hans Albert evidently thought that the loss of Lieserl was at the root of the estrangement of his parents. At the time, he served as his mother's surrogate for the waning love of his father. In 1909 she wrote Savić: "[Hans Albert] should start school early next year, but unfortunately he entered the world a week too late and probably will not be accepted. Then he will stay with his mama for another year; we are actually inseparable and cling terribly to each other."⁴⁴

By 1912, whether she knew it then or not, Marić was competing with more than science for Einstein's affections. During a visit to Berlin, he had started a romantic liaison with his cousin Elsa Löwenthal, a divorcée with two young daughters and literary aspirations, then living there with her parents.⁴⁵ His letters to her refer to Marić, often alluded to as "my cross," in increasingly bitter terms: "Miza [nickname for Marić] is the sourest sourpuss that has ever been. . . . I cannot be at ease at home . . . she herself is the most tormented one, and cannot understand that she herself creates the graveyard atmosphere. Miza is by nature unlovable and mistrustful. When one responds accordingly, she feels persecuted."⁴⁶

By the end of 1913 Marić was aware to some extent of the situation, as he informed Löwenthal: "She [Marić] doesn't ask about you, but I believe she does not therefore underrate the significance that you have for me."⁴⁷

Shortly after their move to Berlin in April 1914, Marić realized that one of its chief attractions for Einstein was cousin Elsa, and returned to Zurich with the two boys, never again to live with Einstein as husband and wife.⁴⁸

The Nature of Their Intellectual Relationship

From the letters Einstein and Marić exchanged as students, a picture emerges of two young people very much enchanted with each other, not least because of their common love for physics.⁴⁹ However, the contrast between their comments on this subject is striking. Einstein's show a young man passionately engaged with his subject, constantly telling Marić

about his readings of both the classics and new papers. Rather than giving bare reports, he critically evaluates his readings, often adding ideas of his own bearing on their subject matter. Without the benefit of hindsight, one cannot point to anything in these early letters giving proof positive of budding genius, but they do convey the distinct impression of an original and imaginative mind at work.

Marić's comments depict an eager, hardworking student, but without a spark of originality, or more precisely, of scientific originality, for she does display flashes of literary talent, catching fire in some descriptive passages rather than in comments on physics.⁵⁰

What was the nature of their intellectual relationship during the student years? They studied physics together, which was very important to Einstein, who at first was quite dependent on her. During the summer break of 1899 he wrote: "When I read Helmholtz for the first time I could not—and still cannot—believe that I was doing so without you sitting next to me. I enjoy working together very much, and find it soothing and less boring."⁵¹ Later that year, Marić requested his help in preparing for her intermediate examinations, which she took a year after he did (see the previous section).⁵² Einstein's physics notes contain a correction in her hand, confirming that she read them carefully.⁵³

In discussing his ideas, Einstein occasionally called upon her for help, such as finding data to corroborate them (see next section); but the letters suggest that the most important role she played in their intellectual relationship during these years was "that of a sounding board for Einstein's ideas," as the editors of the *Collected Papers* (myself included) put it. He had a strong need to clarify and develop his ideas in dialogue with others, a "role also played on occasion by his friends Michele Besso and Conrad Habicht" after his move to Bern.⁵⁴

It is difficult to gauge the nature of her responses to his ideas, since many of his letters and even more of her replies are lost. But fortunately we have her reply to the letter containing his most important original ideas. Almost half of Einstein's letter is devoted to his earliest discussion of the electrodynamics of moving bodies.⁵⁵ Her reply comments on every topic Einstein discussed in this and his previous letter (which she had received at the same time): family matters, vacation, examination preparations, and so on, with the sole exception of the electrodynamics of moving bodies. None of her ten other extant letters comments on his scientific ideas, so this exchange may be typical.

While we can never know their private conversations, later reminiscences suggest her taciturnity in discussions. Philipp Frank, who knew Einstein and questioned him extensively for a biography, discussed their student years: "For Einstein it had always been pleasant to think in society, or better perhaps, to become aware of his thoughts by putting them into words. Even though Mileva Maritsch [Marić] was extremely taciturn and rather unresponsive. Einstein in his zeal for his studies hardly noticed

it."⁵⁶ Just after their marriage, Einstein and two friends set up the mock "Olympia Academy" to discuss topics in the foundations of science, usually holding their sessions in the Einsteins' home. Maurice Solovine recalled that "Mileva, intelligent and reserved, listened attentively to us, but never intervened in our discussions."⁵⁷

Marić's Work in Physics

Marić's only comments on her own work concern her studies at the Poly. The most interesting concerns her diploma thesis, prepared as part of the final examinations:⁵⁸ "Prof. Weber has accepted my proposal for the diploma thesis, and was even very satisfied with it. I am very happy about the investigations I'll have to do for it. E[instein] has also chosen a very interesting topic."⁵⁹ Both of them carried out experimental studies of heat conduction, one of Weber's pet research topics, under his supervision. Einstein also commented on her work in a letter to Marić: "For the investigation of the Thomson effect I have again resorted to a different technique, which is similar to your method for determining the dependence of K [the coefficient of thermal conductivity] on T and which also presupposes such an investigation."⁶⁰ Weber graded her work 4 (out of 6) and his 4.5.⁶¹ In retrospect, Einstein characterized the topic of their work harshly, as "totally uninteresting to me";⁶² neither thesis led to a publication and the Poly routinely discarded such student theses, so an independent judgment is impossible. At any rate, evidence that Marić devised an experimental technique has no bearing on the question of her talent in theoretical physics, the area in which Einstein made his name. Marić's other references to her work in physics are limited to discussions of preparations for examinations (see previous section), as are Einstein's other comments on it.

More relevant are two letters to Savić discussing Einstein's work in theoretical physics. The first states:

Albert has written a paper on physics that will probably soon be published in the physical *Annalen*.⁶³ You can imagine how proud I am of my dear treasure. It is really no ordinary work, but very significant, on the theory of fluids. We have sent a private copy to [Ludwig] Boltzmann, and would really like to know what he thinks of it, hopefully he will write to us.⁶⁴

The work in question is a theory of molecular forces. Discussing this work, Einstein wrote Marić:

The results on capillarity I recently obtained in Zurich seem to be entirely new despite their simplicity. When we're back in Zurich we'll try to get some empirical data on this subject from [Professor] Kleiner [of the University of Zurich]. If this yields a law of nature, we'll send the results to Wiedemann's *Annalen* [der Physik].⁶⁵

Marić's second letter discusses the doctoral thesis based on the same theory that Einstein submitted to the University of Zurich in 1902 and then withdrew.⁶⁶

Albert has written a splendid work that he has submitted as a dissertation. In a couple of months he will probably receive the doctorate. I have read it with great pleasure and true admiration for my dear little treasure, who has such a clever head. When it is printed, I will send you a copy. It deals with the investigation of molecular forces in gases on the basis of various known phenomena. He is really a splendid fellow.⁶⁷

In both letters, Marić states that the works were written by Einstein, claiming no role in the formulation of the theory; he also speaks of his results.⁶⁸ Nevertheless, in discussing this work both slip easily into the "we" mode, which should be kept in mind when evaluating similar uses of the first-person plural in his letters.

The most notable of these is a reference to "our work" on a problem of much greater significance than his theory of molecular forces (see below), one of the complex of problems that led to the special theory of relativity, and the passage has been cited to support claims that Marić was coauthor of that theory.⁶⁹ Leaving aside the fact that his letter was written in 1901, whereas the theory was not finished until 1905, it is important to put the passage into context.

Physics aroused emotions in Einstein that, during the early stage of their courtship, he felt impelled to share with Marić, come what may. For example, soon after she told him she was pregnant—surely a difficult time for both—he opened a letter as follows: "I have just read a wonderful paper by Lenard. . . . Under the influence of this beautiful piece I am filled with such happiness and such joy that I absolutely must share some of it with you. Be happy and don't fret, darling. I won't leave you and will bring everything to a happy conclusion."⁷⁰ It is striking how many of his few references to joint work were penned at difficult moments in their relationship, amid reassurances of his love and devotion.

For example, Einstein referred to "our work on relative motion" after he left Zurich to stay with his parents, whom she knew to be violently opposed to their engagement. Here is the context:

You are and will remain a shrine for me to which no one has access; I also know that of all people, you love me the most, and understand me the best. I assure you that no one here would dare, or even want, to say anything bad about you. I'll be so happy and proud when we are together and can bring our work on relative motion to a successful conclusion! When I see other people I can really appreciate how special you are.⁷¹

His words here are moving in their emotional intensity, but provide no clue about her contribution to "our work." Elsewhere in his letters, he

does mention specific ideas about “relative motion” and many other topics in physics, but he always refers to his own work. Here is an example: “I’m busily at work on an electro-dynamics of moving bodies, which promises to be quite a capital piece of work. I wrote to you that I doubted the correctness of the ideas about relative motion. But my reservations were based on a simple calculational error. Now I believe in them more than ever.”⁷²

Naturally enough, their correspondence practically stops after Marić joins him in Bern. Their few letters from the crucial years 1903–1905 that led up to the final formulation of the theory of relativity contain nothing relevant, nor is there any other contemporary documentation. Later reminiscences suggest that she continued to play a modest role in his work. The one I find most significant comes indirectly from Hans Albert Einstein, presumably based on information he got from his parents (see note 28). Discussing Einstein’s work on special relativity, Michelsmore writes: “Mileva helped him solve certain mathematical problems, but nobody could assist with the creative work, the flow of fresh ideas. . . . [After he wrote up his work] Mileva checked the article again and again, then mailed it. ‘It’s a very beautiful piece of work,’ she told her husband.”⁷³ The mathematics involved does not go beyond elementary calculus, and it seems unlikely that Marić contributed unique mathematical expertise to the paper; one may speculate that she might have suggested methods of proving certain results and/or checked calculations.

Einstein indeed does thank someone “who stood faithfully at my side and to whom I owe many valuable suggestions” at the end of his paper,⁷⁴ but it is his “friend and colleague M[ichele] Besso.”⁷⁵ Taken together with his silence about Marić, this is interesting—if negative—evidence of his attitude toward her role in his work.

Other documents suggest that Marić played the role of amanuensis on occasion after 1905. Einstein’s notebook for his lecture course on mechanics, given during the winter semester of 1909–1910 at the University of Zurich, includes “seven pages of notes in Mileva Einstein–Marić’s handwriting, containing material very closely corresponding to the introductory sections of the first notebook, followed by an eighth page with a drawing of three intersecting circles, also in Einstein–Marić’s hand.”⁷⁶ And a document entitled “Reply to Planck’s Manuscript,” dated to 1909 or 1910 and included in a letter of Einstein to Planck, is also in Marić’s hand.⁷⁷

Another Einstein lecture notebook from 1910–1911 testifies not only to her familiarity with the notes but to her continued affection. She inserted the words: “Here give a dear little kiss to his [word not deciphered].”⁷⁸

Her letters to Savić from 1909 on, cited in the last section, indicate that she attended his public lectures but bear witness to her growing sense of isolation from his career, as does her only letter to Einstein from this period, written after the 1911 annual meeting of the Society of German

Scientists and Physicians in Karlsruhe, which he attended: “It must surely have been very interesting in Karlsruhe; I would have all too gladly also listened a little, and seen all these grand people [*diese feinen Leute*].”⁷⁹

To sum up, Marić seems to have encouraged and helped Einstein in a number of ways during their years together, notably as the alter ego to whom he could express his ideas freely while developing them in isolation from the physics community. She also appears to have helped by looking up data, suggesting proofs, checking calculations, and copying some of his notes and manuscripts. He never publicly acknowledged this help, nor did a true collaboration ever develop. As he took an increasingly prominent place in the physics community after 1909, she felt increasingly isolated from his work and threatened by his success.

Why Did a Real Collaboration Never Develop?

Was it possible for a married couple to successfully and publicly collaborate in physics at the beginning of the century? Two well-known contemporary couples managed to do so: Marie Skłodowska and Pierre Curie,⁸⁰ and Paul Ehrenfest and Tatiana Afanasieva.⁸¹ There are interesting similarities between them and the Einsteins. All three wives were Slavs with a higher education living in milieus not free of prejudice against educated women.⁸² All three husbands came from secular backgrounds; Einstein and Ehrenfest were Jews, raised in South-German urban environments (Munich and Vienna respectively), who had yet to establish their careers when they married.⁸³

There is also a striking contrast. In the case of the Curies and Ehrenfests, there is abundant contemporary evidence of the importance of the woman’s role in their joint work, and each wife pursued a scientific career after her husband’s death. Marić, of course, did not pursue a scientific career before or after her separation from Einstein, but we see it cannot have been because of the impossibility of such a career.

It also cannot have been because she lacked initial motivation and support. In the face of the many prejudices against and obstacles to women’s higher education, particularly in the physical sciences, Marić possessed sufficient talent and drive, and got sufficient familial and institutional support, to successfully pursue an academic career that brought her to the brink of graduation from the Poly and pursuit of scientific research, alone or in collaboration with Einstein, or at the least a career as a teacher of science. What went wrong?

I suggest three interrelated factors may help to explain why Marić never pursued a scientific career, and in particular why a truly creative collaboration between Marić and Einstein never developed:

1. Her talents in physics were modest, so that she could not take advantage of the “exceptional” status sometimes granted women in the

of the stature of Marie Curie and Lise Meitner in physics, or Sofia Kovalevskaja and Emmy Noether in mathematics.

2. She lost the inner self-confidence and drive necessary to pursue a career in science in the face of the many obstacles that women face.

3. Despite his earlier-expressed intentions, after their marriage Einstein failed to encourage her to pursue an independent career or to involve her in serious collaboration.

I shall elaborate a little on these factors. As we have seen, in spite of her early successes as a student, there is no evidence that Marić ever made the crucial transition from student of physics to independent research worker. There is no record of her original ideas, and her comments on the ideas of others are uncritical. For example, she vastly overrated Einstein's theory of molecular forces (see above) when a critical judgment might have helped him to discard it sooner than he did.⁸⁴

There is nothing really surprising about this;⁸⁵ most physicists, male or female, would have had to play a subordinate role in collaborating with Einstein. The evidence suggests that she did so, even without public acknowledgment, which might have been painful to her had she not been so willing to acknowledge his superiority and subordinate her own career goals to his. But she accepted this role without complaint, and even accepted—but not without complaint—her growing exclusion from this modest role in his work. Part of her resignation may be ascribed to her great love and admiration for him. But I think there is more to the story.

Her early letters evidence the good cheer, drive, and talent necessary to enable a young woman of her generation to get from a remote region of the Balkans to Section VIA of the Poly. But by the end of her student days—at a crucial point in her intellectual development—she lost the inner self-confidence so vital to overcoming the considerable obstacles on her path to a career in physics, a self-confidence that Einstein possessed in abundance and never lost, even at the most desperate moments in his life. Two failures to pass the final examinations and the loss of Weber as a mentor were undoubtedly contributing factors, but her relationship with Einstein also played a role. The pressures on a woman to subordinate her intellectual to her emotional life were even stronger then than they are today. As her letters attest, she was painfully shy and fearful of criticism, and his parents' opposition, of which she was well aware even though she had never met them (rather than shield her, Einstein reported their comments),⁸⁶ must have afflicted her. Above all, her pregnancy out of wedlock and the fate of Lieserl seem to have contributed to an underlying depression that grew as the years passed. Perhaps partly in reaction to the loss, she became exceptionally devoted to her first son, born early in the second year of their marriage: and she was unable to find a way to combine

her conception of the duties of motherhood with those of a career outside the home.

Given all these factors, she still might have played a more satisfying if subordinate collaborative role in his work, as did several male physicists during this period.⁸⁷ A married woman at that time was hardly likely to find another mentor than her husband, so her fate as a physicist was entirely dependent on Einstein.⁸⁸ But after their marriage, he failed to foster such a full collaboration. However modest her talents, he could have publicly acknowledged her contributions to his work, and helped her to enter the world of physics after he gained recognition. He is reported to have helped around the house,⁸⁹ but obviously he was not engulfed by household duties and could have done more to ensure that she was not. Instead, he seems to have been content to let her play the "philistine" role of hausfrau, involving her in his work as little more than occasional amanuensis, and never publicly acknowledging her contributions. Again, there is an obvious contrast with Pierre Curie and Paul Ehrenfest, who took pains to assure that their wives' contributions to joint work were publicly acknowledged,⁹⁰ so that success was shared. Far from bringing Einstein and Marić closer, the widespread recognition of Einstein's scientific activities became an important factor in their ultimate estrangement.

70. L. L. Nunn to Francis Nunn Whitman, June 16, 1909, LLNP.
71. L. L. Nunn to E. N. Whitman, October 6, 1906, and L. L. Nunn to C. O. Whitman, October 25, 1905, LLNP.
72. Lillie, *Marine Biological Laboratory*, 43–46.
73. *Ibid.*, 48–60.
74. L. L. Nunn to E. N. Whitman, October 6, 1906, LLNP.
75. L. L. Nunn to F. N. Whitman, June 16, 1909, LLNP.
76. E. N. Whitman to L. L. Nunn, May 10, 1894, LLNP.
77. E. N. Whitman to L. L. Nunn, March 10 [1901?], LLNP.
78. Deed, L. L. Nunn to Florence Tinkham, January 27, 1904, and L. L. Nunn to Carroll Nunn Whitman, September 28, 1912, LLNP.
79. C. O. Whitman to L. L. Nunn, October 14, 1905, LLNP.
80. *Ibid.*
81. L. L. Nunn to E. N. Whitman, October 6, 1906, LLNP.
82. Heckman to Sweeting, n.d., LLNP.
83. C. O. Whitman to C. N. Whitman, June 8, 1909, LLNP.
84. E. N. Whitman to L. L. Nunn, July 31 [1909], LLNP.
85. Burkhardt, “Whitman and Craig,” 194–196.

Chapter 13: Albert Einstein and Mileva Marić

I am grateful to the editors of *The Collected Papers of Albert Einstein* for making available drafts of volumes 3, 4, and 5; and to A. J. Kox, Jürgen Renn, and Robert Schulmann for discussions of a number of these documents. I am also grateful to Gerald Holton, Françoise Balibar, and the editors of this volume for comments on earlier drafts of this chapter.

1. She sometimes used Marity, the Hungarian form of her last name; she followed Swiss custom after her marriage, using Einstein-Marić or Einstein-Marity.
2. *Albert Einstein and Mileva Marić, The Love Letters*, trans. Shawn Smith, ed. Jürgen Renn and Robert Schulmann (Princeton, 1992), 72–73, cited hereafter as *The Love Letters*. Einstein’s correspondence, including letters to and from Marić, will also be cited from *The Collected Papers of Albert Einstein*, vol. 1, *The Early Years, 1879–1902*, ed. John Stachel et al. (Princeton, 1987), and vol. 5, *The Swiss Years: Correspondence, 1902–1914*, ed. Martin Klein et al. (Princeton, 1993); cited hereafter as *Collected Papers*, vols. 1 and 5.
3. They met in 1896, married in 1903, separated in 1914, and divorced in 1919.
4. For his publications during this period, see *The Collected Papers of Albert Einstein*, vol. 2, *The Swiss Years: Writings, 1900–1909*, ed. John Stachel et al. (Princeton, 1989); vol. 3, *The Swiss Years: Writings, 1909–1911*, ed. Martin Klein et al. (Princeton, 1993); and vol. 4, *The Swiss Years: Writings, 1912–1914*, ed. Martin Klein et al. (Princeton, 1995); cited hereafter as *Collected Papers*, vols. 2, 3, and 4.
5. See Desanka Truhović-Gjurić, *Im Schatten Albert Einsteins/Das tragische Leben der Mileva Einstein-Marić* (Bern/Stuttgart, 1983), cited hereafter as *Im Schatten Albert Einsteins*; Senta Troemel-Ploetz, “Mileva Einstein-Marić: The Woman Who Did Einstein’s Mathematics,” *Women’s Studies International Forum* 13 (1990): 415–432; Evan Harris Walker, “Did Einstein Espouse His Spouse’s Ideas?” *Physics Today* 42, no. 2 (February 1989), 9–11 (for my comments, see *ibid.*, 11–13); *idem*, “Ms. Einstein” (paper presented at the AAAS meeting, New Orleans, February 1990); and *idem*, “Mileva Marić’s Relativistic Role” (presented at the AAAS Meeting, Washington, D.C., February 1991).
6. “Einstein and Marić: The Early Years,” in *Einstein’s Early Years: 1879–1905*, ed. Don Howard and John Stachel (Boston/Basel/Berlin, forthcoming), cited hereafter

as “Einstein and Marić.” See also Roger Highfield and Paul Carter, *The Private Lives of Albert Einstein* (London/Boston, 1993), cited hereafter as *Private Lives*, and Abraham Pais, *Einstein Lived Here* (Oxford/New York, 1994).

7. Sources for information on her life include *Im Schatten Albert Einsteins*; Dorde [George] Krstić, “Mileva Einstein-Marić,” Appendix A in Elizabeth Roboz Einstein, *Hans Albert Einstein: Reminiscences of His Life and Our Life Together* (Iowa City, 1991); her correspondence with Einstein in *Collected Papers*, vols. 1 and 5; and her letters to her friend and confidante, Helene Savić, née Kauffer. Some excerpts from the Savić letters are cited from *Collected Papers*, vol. 1, and unpublished excerpts are cited (in my translations) from photocopies of originals presented by Savić’s grandson, Professor Milan Popović (Belgrade), to the editors of *The Collected Papers*. These copies will be cited as in the Einstein Papers Project Archives, Boston University. A useful synthesis of this material is found in *Private Lives*.

8. Einstein is discussed here only insofar as is relevant to their intellectual relationship. For a fuller discussion of their relationship up to 1905, see “Einstein and Marić.” For a differing account of their relationship, more skeptical of Einstein’s early devotion to Marić, see *Private Lives*.

9. See Phyllis Stock, *Better Than Rubies: A History of Women’s Education* (New York, 1978), 166; cited hereafter as *Better Than Rubies*. There also may have been medical reasons for Marić’s move, since she had been very ill with a lung disorder.

10. See Schweizer Verband der Akademikerinnen, *Die Frauenstudium an der Schweizer Hochschulen* (Zurich, 1928), cited hereafter as *Die Frauenstudium*.

11. For a discussion of the first generation of Russian women to study in Zurich, see Christine Johanson, *Women’s Struggle for Higher Education in Russia, 1850–1900* (Kingston/Montreal, 1987), 51–58. According to Johanson, while many male students were hostile, “most professors allowed no sexual discrimination in the classroom” (53).

12. Indeed, pressure from Russian women prompted Zurich to open its doors (see *Better Than Rubies*, 145). In the first decades after the Swiss universities admitted women, the large majority were non-Swiss, mainly Slavs (see *Die Frauenstudium*).

13. For his *Matrikel* (official record), see *Collected Papers*, vol. 1, doc. 28, pp. 45–50. Her *Matrikel* is in file no. 85, *Rektoratsarchiv*, Eidgenössische Technische Hochschule (ETH).

14. Truhović-Gjurić suggests, without any evidence, that Marić left the Poly in flight from her intense romantic relationship with Einstein (see *Im Schatten Albert Einsteins*). Their letters suggest that the relationship was not yet very intense (see *Collected Papers*, vol. 1, esp. docs. 36 and 39). The brevity of Marić’s stay in Heidelberg may be explained by Kaplan’s observation that “the first women students at Heidelberg . . . suffered from extraordinary gender discrimination” (Marion Kaplan, *The Making of the Jewish Middle Class: Women, Families, and Identity in Imperial Germany* [New York, 1991], 149).

15. For this information, see *Collected Papers*, vol. 1, esp. docs. 50, 52, and 53.

16. His parents’ opposition was based on Marić’s age (she was four years older than Einstein), her intellectuality, and probably her Slavic origins. His mother made the first two objections explicit: “By the time you’re 30 she’ll be an old witch.” “Like you, she is a book—but you ought to have a wife” (*The Love Letters*, 20). Anti-Slav prejudices are still common in Germany, and Einstein’s parents had not objected to his earlier romance with a young teacher of Swiss-German background who was also slightly older than he (see *Collected Papers*, vol. 1, docs. 15, 18, and 32).

17. Einstein’s letters to Marić mention treatises by Boltzmann, Drude, Helmholtz, Kirchhoff, and Mach (see *Collected Papers*, vol. 1).

18. See *Collected Papers*, vol. 1, doc. 67, p. 247. The three mathematics students in VIA took different exams. Truhović-Gjurić (*Im Schatten Albert Einsteins*) does not mention her failure to graduate; Troemel-Ploetz (“The Woman Who Did Einstein’s

Mathematics”) ascribes it to discrimination against women at the Poly without mentioning her grades; while Walker (“Ms. Einstein”) states, without citing evidence, that “Marks below 5.00 were probably customarily below the passing grade.” Einstein, with a total of 54 points out of a possible 66, was one point short of that average, while Marić, with a total of 44 points, was 11 points short.

19. In mid-1900, she mentions “a large work . . . that I have chosen for myself as a Diploma Thesis and probably also a Doctoral Thesis” (*Collected Papers*, vol. 1, 260, n. 5). In May 1901, Einstein asks about her doctoral thesis, advising her to use some of Weber’s work in it, “even if you only seem to” (*ibid.*, 305).

20. In May 1901, Marić wrote Savić, “I have already quarreled a couple of times with Weber, but we’re already used to that” (*Collected Papers*, vol. 1, doc. 109, p. 303, my translation).

21. See *Collected Papers*, vol. 1, doc. 87, p. 275.

22. See Protocol of Section VIA, July 26, 1901, ETH Library (Zurich). Her average was again 4.

23. Einstein first mentions Kleiner in October 1900 (*Collected Papers*, vol. 1, 267); a year later, he discussed the complete dissertation (*ibid.*, 321). He withdrew it in February 1902 (see *ibid.*, doc. 132, p. 331), probably because of objections by Kleiner, but they stayed in contact. Einstein’s successful 1905 doctoral dissertation was approved by Kleiner, who helped him obtain his first full-time academic post in 1909 (see below).

24. Presumably, Lieserl was born at Marić’s home. However, recent efforts to find civil or church records of the birth in her hometown or nearby failed.

25. The delay was connected with the opposition of his family (see *Collected Papers*, vol. 1, doc. 138, p. 336). On his deathbed, Einstein’s father gave his consent in October 1902, according to Abraham Pais, “*Subtle is the Lord . . .*”: *The Science and the Life of Albert Einstein* (Oxford, 1982), 47.

26. See *Private Lives*, 90.

27. Late in 1901, after he was assured of a Patent Office job, he wrote Marić: “The only problem that still needs to be resolved is how to keep our Lieserl with us; I wouldn’t want to have to give her up. Ask your Papa, he’s an experienced man and knows the world better than your overworked, impractical Johnny” (*Collected Papers*, vol. 1, doc. 127, p. 324, translation from *The Love Letters*, 68).

28. Peter Michelmores, *Einstein: Profile of the Man* (New York, 1962), states: “Hans Albert Einstein . . . had never discussed his father before with any writer, at least not in depth. But he answered all my questions, and waited while I wrote down all the answers” (vii). Hans Albert inherited his mother’s papers, and his first wife, Frieda Einstein-Knecht, transcribed excerpts from Einstein’s letters discussing Lieserl. So, if not told earlier by either parent, Hans Albert knew about his sister by the time he spoke to Michelmores.

29. Michelmores, *Einstein*, 42.

30. Leo Tolstoy, *Anna Karenina*, trans. Louise and Aylmer Maude (London, 1965), 1.

31. *Collected Papers*, vol. 5, doc. 5, letter of January 22, 1903, p. 10 (my translation).

32. Marić to Savić, March 20, 1903, copy in Einstein Papers Project Archives, Boston University.

33. *Collected Papers*, vol. 5, doc. 13, p. 22, translation modified from *The Love Letters*, 53.

34. For further speculation, see *Private Lives*, 88–91.

35. *Collected Papers*, vol. 5, doc. 13, p. 22, translation from *The Love Letters*, 53.

36. Marić to Savić, September 3, 1909, copy in Einstein Papers Project Archives, Boston University.

37. The flirtatious nature of their earlier relationship is apparent from a poem Albert wrote for her (*Collected Papers*, vol. 1, doc. 49, p. 220).

38. See *Collected Papers*, vol. 5, 181, 198–199; Einstein–Marić to Georg Meyer, May 23, 1909, copy in the Archive of the Einstein-Gesellschaft, Swiss National Library (Bern). For a fuller account, see *Private Lives*, 124–126. Einstein’s anger flared up again over forty years later, when he blamed Marić’s pathological jealousy on “uncommon ugliness” (Einstein to Erika Schaerer-Meyer [Meyer-Schmid’s daughter], cited in *Collected Papers*, vol. 5, 199, n. 4).

39. Marić to Savić, September 3, 1909, copy in Einstein Papers Project Archives, Boston University.

40. Marić to Savić, n.d. [c. October 1909], copy in Einstein Papers Project Archives, Boston University.

41. By this point, the Poly had been renamed the Eidgenössische Technische Hochschule, or ETH for short.

42. Marić to Savić, n.d. [c. January 1911], copy in Einstein Papers Project Archives, Boston University.

43. Michelmores, *Einstein*, 57.

44. Marić to Savić, n.d. [c. October 1909], copy in Einstein Papers Project Archives, Boston University.

45. As children, they were well acquainted, and her father (nicknamed “Rudolf the rich” by Einstein) was the chief creditor of his father’s debts (see *Collected Papers*, vol. 1, doc. 93, p. 281). For their relationship, see his letters to her in *Collected Papers*, vol. 5; for her poetry reading, see Pais, *Einstein Lived Here*, 145.

46. *Collected Papers*, vol. 5, 585, 587.

47. *Ibid.*, 558.

48. After their divorce he regularly stayed at Marić’s house when visiting Zurich.

49. See *Collected Papers*, vol. 1. For a more detailed discussion of their relationship up to 1905, see “Einstein and Marić.”

50. For her most extensive comment on physics, see *Collected Papers*, vol. 1, doc. 36, last paragraph, p. 59. For an example of her descriptive powers, see *ibid.*, doc. 109, pp. 301–302.

51. *The Love Letters*, 9.

52. *Ibid.*, 12–13.

53. See *Collected Papers*, vol. 1, doc. 37, p. 139.

54. *Ibid.*, vol. 1, xxxix–xi.

55. “On the Electrodynamics of Moving Bodies” is the title of his famous 1905 paper on special relativity (*Collected Papers*, vol. 2, doc. 28). See the next section for further discussion of this topic.

56. Philipp Frank, *Einstein: His Life and Times* (New York, 1953), 21.

57. Albert Einstein, *Lettres à Maurice Solovine*, ed. Maurice Solovine (Paris, 1956), introduction, xii.

58. This has sometimes been confused with a doctoral thesis. Marić hoped to use her diploma thesis work as the basis for a doctorate, but she was never a candidate for that degree.

59. *Collected Papers*, vol. 1, doc. 63, pp. 243–244; translation from the supplementary *English Translation*, trans. Anna Beck (Princeton, 1987), 138.

60. *The Love Letters*, 30.

61. See *Collected Papers*, vol. 1, doc. 67.

62. See *ibid.*, note 33, 244.

63. I.e., the *Annalen der Physik*; it became his first publication (see *Collected Papers*, vol. 2, doc. 1).

64. *Collected Papers*, vol. 1, doc. 85, p. 273, my translation.

65. *Ibid.*, doc. 79, p. 267, my translation..

66. See *Collected Papers*, vol. 1, doc. 132, p. 331.

67. *Ibid.*, doc. 125, p. 320, my translation.

68. It has been suggested that she attributed *her* work to him. But it is hard to see why she would do so in private letters to a close personal friend. If the expressions of admiration in these letters were meant to characterize her own work, they would give a most unpleasant impression of her character. If we accept her word that she picked her final diploma thesis topic, I see no reason to doubt it when she says he wrote the articles in question.

69. See the articles by Walker and Troemel-Ploetz cited in note 5.

70. *The Love Letters*, 54.

71. *Ibid.*, 39.

72. *Ibid.*, 69.

73. Michelmore, *Einstein*, 45–46. Such comments, and similar (but less reliable) anecdotal accounts by Marić's relatives in the Vojvodina (see *Im Schatten Albert Einsteins*), led to Senta Troemel-Ploetz's appellation: "Mileva Marić: The Woman Who Did Einstein's Mathematics."

74. See *Collected Papers*, vol. 2, doc. 23, pp. 276–306.

75. *Ibid.*, 306. Besso's role is explained more precisely in later reminiscences by Einstein, notably his 1922 Kyoto lecture (see *ibid.*, 264), and Michelmore also mentions it (*Einstein*, 45).

76. *Collected Papers*, vol. 3, doc. 1, p. 125, descriptive note.

77. *Ibid.*, doc. 3, pp. 177–178.

78. *Ibid.*, doc. 11, p. 321.

79. Mileva Marić to Albert Einstein, October 4, 1911, in Einstein, *Collected Papers*, vol. 5, doc. 290, p. 331.

80. Einstein and Marić met Marie Curie only after Pierre's death. For her life, see Eve Curie, *Madame Curie*, trans. Vincent Sheean (New York, 1937); Rosalind Pflaum, *Grand Obsession: Madame Curie and Her World* (New York, 1989); and Helena M. Pycior, "Marie Curie's 'Anti-natural Path': Time Only for Science and Family," in *Uneasy Careers and Intimate Lives: Women in Science, 1798–1979*, ed. Pnina G. Abir-Am and Dorinda Outram (New Brunswick, N.J., 1989), 191–214.

81. Both Einstein and Marić knew Ehrenfest and Afanasieva. For his life and their relationship, see Martin Klein, *Paul Ehrenfest*, vol. 1, *The Making of a Theoretical Physicist* (Amsterdam, 1970). Klein cites an obituary in Dutch, but there is no biography of Afanasieva.

82. Speaking of the German milieu, Kaplan notes "the popular stereotype of the Russian female student, who was portrayed as a radical, both politically and personally" (*The Making of the Jewish Middle Class*, 147); and she writes that "bourgeois parents displayed extraordinary ambivalence regarding their daughters' aspirations. . . . the fear lingered that educated daughters would educate themselves right out of the marriage market" (142).

83. Pierre had a well-established career in physics when he met Marie.

84. A few years later he referred to his first two papers as "worthless beginner's works" (see *Collected Papers*, vol. 5, doc. 66, p. 79).

85. "[O]ut of about one thousand [male] students there is hardly a single one who has the abilities for independent scientific accomplishment in the higher sense, so the demands on women at the least should not be set any higher" (Ella Wild, *Einleitung to Die Frauenstudium*, 15–16).

86. It seems plausible that he used Marić to help him break free of his family, especially his mother.

87. See, e.g., Lewis Pyenson, "Einstein's Early Scientific Collaboration," *Historical Studies in the Physical Sciences* 7 (1976): 84–123.

88. I am indebted to Pnina Abir-Am for this insight.

89. See, e.g., the account by his son Hans Albert, cited in *Private Lives*, 129.

90. For the Curies, See Helena M. Pycior, "Reaping the Benefits of Collaboration

While Avoiding Its Pitfalls: Marie Curie's Rise to Scientific Prominence," *Social Studies of Science* 3 (1993): 301–323. There is no study of the collaboration between the Ehrenfests, but I can cite a few indications of his efforts. Of the two articles they wrote jointly in 1906, the first is signed Tatiana and Paul Ehrenfest, the second is signed Paul and Tatiana Ehrenfest (see Paul Ehrenfest, *Collected Scientific Papers*, ed. Martin Klein [Amsterdam/New York, 1959], 107, 127). Their joint article on the foundations of statistical mechanics in the prestigious *Encyklopaedie der Mathematischen Wissenschaften* states: "The critical review and systematization of the results of all fundamental investigations was carried out by the authors in common work. P. Ehrenfest bears the ultimate responsibility for the final editing" (213).

Chapter 14: Sociologists in the Vineyard

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1. Everett Hughes, "Professional and Career Problems in Sociology," *Transactions of the Second World Congress of Sociology* 1 (1954): 182.

2. Helen Hughes, "Wasp/Woman/Sociologist," *Society*, July–August 1977, 80.

3. See especially Mary Jo Deegan, *Jane Addams and the Men of the Chicago School, 1892–1918* (New Brunswick, N.J., 1988), 55–69, 194–195; Rosalind Rosenberg, *Beyond Separate Spheres: Intellectual Roots of Modern Feminism* (New Haven, Conn., 1982), 28–53, 62–68. See also Marlene Shore, *The Science of Social Redemption: McGill, the Chicago School, and the Origins of Social Research in Canada* (Toronto, 1987), and Dorothy Ross, *The Origins of American Social Science* (Cambridge, 1991). For details on Small, see Harry Elmer Barnes, "Albion Woodbury Small: Promoter of American Sociology and Expositor of Social Interests," in *An Introduction to the History of Sociology*, ed. H. E. Barnes (Chicago, 1948), 432.

4. See Deegan, *Jane Addams*, 152–155, 213–214, for evidence of Park's hostility to women including those who were his colleagues; he opposed women's suffrage as well.

5. "Recollections," Everett C. Hughes Papers, Joseph Regenstein Library, University of Chicago, box 1.

6. David Riesman, "The Legacy of Everett Hughes," *Contemporary Sociology* 12 (1983): 477.

7. E. C. Hughes Papers, autobiographical writings, box 23, "Notes on Student Days," January 1976, 1.

8. He studied with Jacob Viner, then a young economist; Albion Small, a "thoughtful man who taught a scholarly theory and history of sociology course"; Ellsworth Faris; and Robert Park, who used his own new *Introduction to the Science of Sociology*, written with Ernest Burgess, which defined sociology in terms of the second-generational perspective described earlier. *Ibid.*, 1–4.

9. *Ibid.*, 7.

10. E. C. Hughes Papers, box 23, graduate school memoirs, 3.

11. *Ibid.*, 4.