

Chapter II

Wundt's first forty-three years:

"Only a stage of preparation."

Wundt lived to the age of 88, but biographical accounts did not begin to appear until some sketches honored him on his eightieth birthday in 1912. The centennial celebration of Wundt's Institute for Experimental Psychology occasioned several studies of the personality of Wundt, in particular the amassing of family and biographical data by Wolfgang Bringmann and Gustav Ungerer.⁶⁵ This chapter uses published biographical and autobiographical writings to explore the background and personality of Wundt, how he came to his particular convictions about the possibility and the nature of psychological science within the general intellectual environment outlined in the opening chapter.

Wundt finished his autobiography, Erlebtes und Erkanntes, shortly before his death in 1920. A rambling account by an octogenarian, it contains details that are nevertheless vivid and significant. Wundt's early recollections include family, a difficult primary education plagued by daydreams and inattention to studies, and an awareness of political and social developments in pre-Bismarckian Germany.

⁶⁵Wolfgang Bringmann and Gustav A. Ungerer, "Wilhelm Wundt--archival sources," in Historiography of modern psychology: Aims, resources, approaches, ed. Josef Brozek and Ludwig J. Pongratz (Toronto: Hogrefe, 1980), 201-240.

A. Childhood.

1. Family in Baden.

Wilhelm Maximilian Wundt was born on August 16, 1832, the fourth and youngest child of the Protestant pastor Maximilian Wundt (1787-1846) and Marie Friederike née Arnold (1797-1868).⁶⁶

His place of birth was Neckerau, a village near the Rhine port of Mannheim in the Grand Duchy of Baden. Only Wilhelm and a brother Ludwig (1824-1902) survived infancy.

Wundt was descended from Austrian and French Calvinist refugees who settled in the Rhineland and the Palatinate. On the paternal side the family tree displays Calvinist clergymen and theologians at Heidelberg University; his mother's side includes natural scientists, physicians and government administrators. Wundt remembered his father as a man of tender character who, with only one notable exception, was always affectionate toward him. Wundt's mother was more practical and ambitious, and she was the one who disciplined and, for all practical purposes, raised him.

Wundt's father was a pastor of the United Evangelical Church of Baden, which was more Calvinist than Lutheran. The official

⁶⁶The following summary of family and early life depends primarily on Wolfgang G. Bringmann, Norma J. Bringmann, and William D. G. Balance, "Wilhelm Maximilian Wundt 1832-1874: The formative years," in Wundt studies, a centennial collection, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: C. J. Hogrefe, 1980), 13-32. Hereafter Bringmann et al.

evaluation by his superiors characterized Maximilian Wundt as mild and peace-loving. He was apparently relatively liberal in outlook, more interested in the everyday needs of his congregation than in strict interpretation of Biblical texts.

When Wundt was less than a year old, the family left Neckarau and moved to a small farming town, Leutershausen, in the uplands near Heidelberg. One reason for the move to the lower paying post was the health of baby Wilhelm--he had contracted malaria, which was endemic to the marshy Mannheim area. Soon his brother Ludwig went to Heidelberg to live with his mother's sister and attend school. Wilhelm thus lived the life of an only child.

From age four to twelve, Wundt lived in Heidelshelm, a large village near the town of Bruchsal, south of Heidelberg. Here his father had a parish of about 2000 souls--the largest charge of his career, and his last one. Heidelshelm was a religiously integrated community, with a sizeable minority of Catholics and even a few hundred Jews with their own synagogue and school.⁶⁷ Wundt and his mother often visited a nearby Jewish family, and Wundt occasionally observed religious rituals in the neighbors' home and synagogue. Wundt's memory of his first literary project reflects the liberal and scholarly interests of the young boy: having just learned to print he wrote what seemed to him at the time to be a "great tome" on the history of world religions; the

⁶⁷Max Weber was later impressed by aspects of the religious mix in Baden, as he developed his famous theory: Max Weber, The Protestant ethic and the spirit of capitalism, trans. Talcott Parsons (NY: Charles Scribner's Sons, 1958), 39, fn 8, 188-189.

purpose was to show the features common to them all.⁶⁸ Wundt's later anthropological writings produced a more sophisticated version of the same theme.

Heidelsheim also had its share of political strife. Church officials described the community as unruly and demoralized, and Wundt's father found there both a higher salary and more work. Relations with the Catholics, who shared the small church building, were strained, and the preceding pastor had antagonized his own parishioners by being overly strict.

During Wundt's first year at grammar school, a violent "village revolution" broke out. The sitting mayor lost an election decisively, but the district commissioner from Bruchsal disqualified the newly elected mayor and reinstated the unpopular official. The interference precipitated a violent protest: the mayor's house was burned; mounted militia from Bruchsal rode in, dispersed the rioters, and arrested dozens of them. Some of them received heavy prison sentences and fines, in spite of the efforts of Wundt's father to win clemency for them. The rebellious majority styled themselves as the "Poles" and called the mayor's supporters the "Russians." The romance of the Polish rebellion of 1830 was alive in Baden in 1838, and it would rise up again a decade later.

2. Daydreams and early education.

⁶⁸Wundt, Erlebtes und Erkanntes (Stuttgart: Kröner, 1920), 199.

As a child Wundt was apparently most content just to be left alone. He hated having to take part in play and activities with other children in the village. His only companion his own age was a retarded child who could barely speak but was "very good-natured." Wundt remembered that he enjoyed being with adults who would indulge his imagination with story-telling and play-acting.

In grammar school this imagination turned to uncontrolled daydreaming. One day his father attended the school in his pastoral role as school inspector, and Wundt's daydream was rudely interrupted by a slap in the face. A stern gaze from his father's face greeted his return to reality. Wundt's earliest memory of his educational experience was all the more vivid because it was the only occasion he could recall that his father punished him.

In his biography of Wundt, Solomon Diamond has made much of the fact that both this incident and Wundt's very earliest memory were painful episodes involving his father. As a toddler, Wundt followed his father to a dark staircase and fell. The darkness and Wundt's feeling of helplessness as his head hit the steps stayed in Wundt's mind's eye until the end of his life. Diamond finds psychoanalytic relevance in these two early episodes: "we are struck by the ambivalence that turns a loving father, in each instance, into a source of pain. Clinically we know that a boy's identification with such a father can lead to distrust of himself."⁶⁹ Starting with these earliest memories volunteered by

⁶⁹Solomon Diamond, "Wundt before Leipzig," Wilhelm Wundt and

Wundt, Diamond constructs a personality problem in Wundt that, he argues, continued throughout his life and inhibited his ability to lead the new scientific psychology.

Perhaps more significant is the fact that Wundt apparently had little contact with his father's family (the more religious side), whereas his mother's family (the university and scientific side) strongly influenced his childhood and early career.

As a small boy, Wundt made memorable visits to Zacharias Arnold (1767-1840), his mother's father. The retired administrator of Heidelberg University domains was a cultured man, full of energy, varied interests and love of order. He took the boy on educational walks and taught him about the city. Together they watched construction of the first railway between Heidelberg and Mannheim. Wundt remembered feeling sympathetic toward the angry peasant women who were forced to tear out their vineyards and give way to the new railway station. When the first locomotive rolled out, his grandfather pointed out the Englishman at the controls, instructing a German how to run the engine. Visits to grandfather in Heidelberg entailed discipline that was stricter than at home. Wundt recalled once being punished by confinement in a dark closet, "a punishment which even aroused my mother's deepest sympathy."⁷⁰ Apparently Mrs. Wundt could be strict, too.

In 1840 grandfather Arnold died and Wundt's father suffered

the making of a scientific psychology, ed. Robert W. Rieber (NY: Plenum, 1980), 3-70; 8. Hereafter Diamond.

⁷⁰Wundt, Erlebtes und Erkanntes, 37.

a stroke. The next male influence in the eight-year-old boy's life was a young vicar, Friedrich Müller (1814-1871), who carried out most of the pastoral duties as the health of Wundt's father declined. Wundt was withdrawn from grammar school and tutored at home by Müller, who was as kind-hearted as Wundt's father. Wundt and the young vicar shared a room, but since Müller was often busy seeing to the needs of the parish, Wundt was alone much of the time.

The psychologist whose work would emphasize the role of attention and the focusing of mental activity remembered his inattention as a young pupil, or rather, his attention to inappropriate things. He recalled staring blankly at his books and daydreaming, so vividly that he could interrupt an imaginary adventure when the vicar returned and then continue it from the same place later. Wundt remembered his impatience for his tutor to leave so that he could return to his dream world. Unfortunately, Wundt does not specify the nature of these daydreams.

Friedrich Müller's four years in the Wundt household defined an important phase of the boy's life. Wundt loved his teacher and companion and felt closer to him than to his dying father or his busy mother. He could not recall the young vicar ever punishing him. Müller apparently did an adequate job teaching Wundt Latin but prepared him poorly in mathematics. And Müller did nothing to help the boy control his daydreaming. Then Müller left Heidelberg to take his own parish in a nearby town in 1844, Wundt convinced his parents to let him live with his tutor until

the next fall. Then he went to Bruchsal to enter the Gymnasium, one of the special German high schools which prepared boys for the university.

Wundt recalled 1844-45, his first year of high school, as utterly miserable and full of failure. He was separated from his tutor, living with a Protestant family and attending a predominately Catholic school. To make matters worse, his father suffered another stroke that Christmas holiday. His kind tutor had prepared him for neither the intellectual nor the disciplinary rigors of school. The Gymnasium teachers would not tolerate his inattention and his daydreaming. They slapped him and ridiculed him. A teacher once tried to cheer him with the thought that, even though he was a pastor's son, he had alternatives to university studies--he might become a mail carrier! Wundt ran away once from Bruchsal, but his determined mother brought him back to finish the year.

3. Lyceum student in Heidelberg during the Revolution of 1848.

The Heidelberg relatives rescued Wundt from his misery in Bruchsal. Since that arrangement was clearly not working, they moved him in with his brother Ludwig and enrolled him in the Heidelberg Lyceum, as the Gymnasium there was called. Ludwig entered Heidelberg University that same autumn. Wundt's brother and a cousin set good examples of behavior, and Wundt managed to control his daydreaming and execute his assignments. In fact, Wundt bloomed. He made friends at school and loved living in

Heidelberg.

Wundt's family situation also began to change. Wundt's mother negotiated her husband's retirement and pension, and the parents and two boys all moved in together in Heidelberg in 1846, shortly before Pastor Wundt died. Except for two years of study outside Heidelberg, Wundt continued to live with his mother until her death in 1868. Late in life, Wundt made his summer home in the same neighborhood where he had lived all those years with his mother.⁷¹

As a student in the Lyceum in Heidelberg, Wundt fancied himself to be a writer. His passion for daydreaming was transformed into a passion for reading, and one teacher took special interest in Wundt and encouraged him to write. Even though he appreciated this particular teacher, Wundt continued to hold a low opinion of the teaching profession, no doubt partly due to his disastrous year at Bruchsal.

Although Wundt styled himself a mediocre student in school, his grades were outstanding in Latin, Greek, Hebrew, and history, and quite good in most other subjects. Mathematics, drawing and singing were his weakest subjects; his inconsistent grades in religion may betray some rebelliousness on the part of this pastor's son, who dropped Hebrew explicitly because he did not

⁷¹Wundt and his mother lived at Plöckstrasse 35, according to Gustav A. Unger, "Wilhelm Wundt als Psycholog und Politiker: Anmerkungen zur Biographie," *Psychologische Rundschau*, 31 (1980), 99-110; 100. From Easter 1904 on, Wundt had his vacation house at Plöckstrasse 48; see Wundt to Oswald Külpe, 28 December 1903, UAL, Wundt Nachlass, Nr. 402.

want to study theology.⁷² Wundt's early strength with the written word and relative weakness in mathematics, art, and music give a foretaste of the type of psychologist he became.

In Heidelberg, the teenaged Wundt had a good vantage point for observing the course of the revolution of 1848. In March of that year, he was present in the Heidelberg Museum when some fifty German and Austrian liberals, inspired by the popular revolts in Berlin and Vienna, met there and issued invitations to an all-German National Parliament in Frankfurt-am-Main. Later that year he was part of the tearful crowd that waved black, gold, and red flags during Robert Blum's inspiring speech in the courtyard of the Heidelberg castle. He followed the accounts of street-fighting in Berlin and Vienna, and he witnessed the farmers, armed with their scythes, streaming into Heidelberg from the outlying areas, only to be turned back by the rifles of the city militia.

The liberal National Parliament met in St. Paul's Church [Paulskirche] in Frankfurt amid great hopes and inspiring rhetoric, but the net result was political failure. As the absolute monarchs reasserted their power, the summer of 1849 found the stubborn Republic of Baden holding out against Prussian troops commanded by their crown prince, the future Emperor Wilhelm I. From a nearby mountaintop Wundt watched the Battle of Waghäusel, which decided the end of the Republic of Baden, and of

⁷²Wolfgang G. Bringmann, Charles Early, and Norma J. Bringmann, "William Wundt's high school years: A reassessment," *Revista de historia de la psicologia*, 5 (1984), 69-83.

the revolution in Germany. Some of the rebels were captured; others fled to Switzerland for America.

Heidelberg's citizens braced for the occupation. Happily, as Wundt recalled, their fears soon subsided, as the Prussian troops stayed on their best behavior. A friendly Pomeranian soldier even gave Wundt clarinet lessons. But the Grand Duke was restored to power in Baden before the the Prussian soldiers left, and the years 1849 to 1871 were difficult ones for liberals in Baden. Wundt was himself a liberal, and those difficult years were just the years during which Wundt was educated and launched his career--both scientific and political--in Heidelberg.

B. From medicine to physiology: Training at Tübingen, Heidelberg, and Berlin.

1. University studies: medicine.

In 1851 Wundt got his Abitur, the certificate of successful completion of qualifying examinations for attendance at university. Wundt and his family assumed that he would study for a profession, but the precise plan was not at all clear. Neither his late father nor his mother had urged him in the direction of theology. Wundt's talent for classical languages gave him some interest in scholarship, but he certainly did not want to become a schoolteacher. His cousin had been making anatomical drawings long before beginning medical studies in the university, but Wundt had no such enthusiasm for any particular profession.

Wundt decided to study medicine, he tells us, because that choice afforded him the opportunity to leave his mother's home and go to Tübingen, where her brother, Friedrich Arnold (1803-1890), was professor of anatomy and physiology. Wundt even counted himself lucky that his grades had not been good enough to win a scholarship available to sons of Baden pastors, for in that case he would have started university at Heidelberg. The move to the "foreign" university in nearby Württemberg expanded Wundt's horizons, and he remembered an inclination already in that first year at Tübingen, not to become a physician, but rather a scientist like his uncle.⁷³

Friedrich Arnold was able to help and to influence his independent-minded nephew. Wundt was stimulated by the social scene at Tübingen and became enthusiastic about his studies of brain anatomy. Presumably his uncle encouraged him in both of these interests. When Arnold became professor of anatomy and physiology at Heidelberg the next year, Wundt went with him: the Arnold family was concerned that he was spending too much money in Tübingen, and so it was decided that he should return home to live with his mother.

Wundt promised his family that he would finish his medical studies in three years at Heidelberg. While rushing through the required courses in theoretical and practical medicine, Wundt managed some time to study mathematics with a private tutor to remedy his deficiencies in that subject, so important to the

⁷³Wundt, Erlebtes und Erkanntes, 72.

chemistry and physics used in the new physiology.

Wundt also took advantage of Heidelberg's excellent opportunities to learn natural science. He enjoyed the lecture demonstrations of Philip von Jolly (1809-1884), who had opened one of Germany's early physical institutes in Heidelberg in 1846,⁷⁴ and he was particularly impressed by a newcomer to Heidelberg, Robert Bunsen (1811-1899). Bunsen's lectures on general chemistry included results of his recent research and were richly illustrated by demonstration experiments. The combination of theory and experiment would later characterize Wundt's own lecture style in psychology. When he found out that laboratory exercises in Bunsen's chemical institute were supervised, not by the great chemist himself, but by an inexperienced assistant, Wundt withdrew from the institute and attached himself to the private laboratory of a Privatdozent in chemistry who could give him more personal attention. Still generally inspired by Bunsen, Wundt produced his first scientific paper, a study of his own urine while foregoing table salt. He had the satisfaction of seeing the paper published and later even cited in Carl Ludwig's important textbook on human physiology.⁷⁵

In spite of the attraction of chemistry, physiology was

⁷⁴For a survey of the institutes of physics and their development, see David Cahan, "The institutional revolution in German physics, 1865-1914," Historical studies in the physical sciences, 15:2 (1985), 1-65.

⁷⁵Wundt, "Ueber den Kochsalzgehalt des Harnes," Journal für praktische Chemie, 59 (1853), 354-363. Carl Ludwig, Lehrbuch der Physiologie des Menschen, 2 vols., 2nd ed. (Heidelberg: Winter, 1858-1861).

Wundt's main interest. Medical students, as well as some receptive anatomists like Wundt's uncle Friedrich, were aware that the Revolution of 1848 had coincided with a revolution in life science:⁷⁶

One can describe the years 1848 to 1851 as the time of the foundation of the new direction of physiology, and German science as the unique site of its origin; it was at first an essentially physical direction.

[Demnach kann man die Jahre 1848 bis 1851 als die Zeit der Begründung der neueren Richtung der Physiologie und die deutsche Wissenschaft als die ausschliessliche Stätte ihres Ursprungs bezeichnen, bei dem sie zunächst eine wesentlich physikalische Richtung einschlug.]⁷⁷

As Wundt described in his autobiography, his uncle Friedrich Arnold (1803-1890), Ernst Heinrich Weber (1795-1878), Eduard Weber (1806-1871), and Johannes Müller (1801-1858) were primarily anatomists who began the development of physiology in Germany. Friedrich Arnold, for example, was an excellent vivisectionist but had little command of fundamentals of physics. Johannes

⁷⁶Wundt's memory of this time supports suggestions in Everett Mendelsohn, "Revolution and reduction: The sociology of methodological and philosophical concerns in nineteenth-century biology," in The interaction between science and philosophy, ed. Yehuda Elkana, (Atlantic Highlands, NJ: Humanities, 1974), 407-426.

⁷⁷Wundt, Erlebtes und Erkanntes, 73-74.

Müller was more than a combination of anatomist and physiologist: his chair at Berlin also represented pathology and comparative anatomy, and he made important contributions to all of those areas. In German universities in the 1840s and 1850s, physiology was at most represented by an assistant professor [Extraordinarius], such as Emil du Bois-Reymond (1818-1896) next to Müller, or Karl Vierordt (1818-1884) with Arnold in Tübingen. In the 1850s, Hermann Helmholtz (1821-1894), Carl Ludwig (1816-1895), and Ernst Brücke (1819-1892) reversed the emphasis of their teachers: though they occupied chairs of anatomy-physiology, their important work was in physiology. By the next decade, these younger men all held chairs of physiology. Wundt's generation--he names Ewald Pflüger (1829-1910), Martin Heidenhain (1834-1897) and Julius Rosenthal (1836-1915)--was thus able to choose physiology as a profession, since the late 1850s saw the establishment of chairs of physiology in most German universities.

Young Wundt seemed headed in this direction. His second foray into physiological research won him the prize in experimental medicine at Heidelberg in 1854. At home, with the assistance of his occasionally queasy mother, Wundt studied the effects on respiration of sectioning the vagus and recurrens nerves in rabbits. He worked in secret, perhaps so he could surprise his uncle, the professor who set the problem.⁷⁸ To his great satisfaction he shared first prize with a student "who had

⁷⁸Diamond, 19-20.

been helped by his professor."⁷⁹ Wundt's long article, which his mother helped him prepare, was accepted by Johannes Müller for his important journal.⁸⁰ His secretive behavior suggests that Wundt was eager to prove himself independent of his uncle. Wundt's interest in physiology was probably typical of scientifically-oriented medical students in those days, but the migration of his interest from brain anatomy in Tübingen to the physical and chemical approaches of experimental physiology may also reflect his desire to find an area outside his uncle's expertise.

In the summer of 1855 Wundt took the two-week state medical examinations in Karlsruhe, the capital city of Baden. Among about a dozen successful candidates, he placed first in all three fields of the exam: internal medicine, surgery, and obstetrics.

Wundt recalled that the examiners were practicing physicians rather than university professors, so skill in expression and some knowledge of history of medicine were more useful in the exam than up-to-date medical knowledge.⁸¹ His exam results plus two publications, all by the age of twenty-three, brought him high marks and recognition. He had come a long way since the disastrous first year at the Bruchsal Gymnasium.

⁷⁹Wundt, Erlebtes und Erkanntes, 83.

⁸⁰Wundt, "Versuche über den Einfluss der Durchschneidung des Lungenmagennerven auf die Respirationsorgane," Archiv für Anatomie, Physiologie und wissenschaftliche Medicin, 1855, 269-313.

⁸¹Wundt, Erlebtes und Erkanntes, 90-94.

2. A short career as physician and the decisive move to physiology.

Wundt's relatives were anxious for him to begin practicing medicine. He rejected the idea of general practice, but considered two other choices: military physician or doctor at a local health spa. The first option was attractive; Vierordt had told him that it was a convenient way to begin a career in research. (Helmholtz also had served several years as a military physician.) It turned out, however, that there were no openings in the Army. Wundt then decided against the spa because he was uncomfortable with the idea of having to entertain, as well as treat, the "anemic daughters of Baden's bureaucrats."⁸²

An attractive temporary job opened: assistant in the women's ward of the university hospital for a half year. This position allowed him to work for one of his favorite professors, Ewald Hasse (1810-1902), pathologist and a director of the hospital. Solomon Diamond has insinuated that Wundt's lack of self-confidence made him prefer the military post because "he could do little harm to healthy young soldiers."⁸³ If this were so, Wundt should have also chosen the spa over the hospital. With all his psychoanalytic insight, Diamond overlooks interesting aspects of Wundt's decision. Wundt chose to treat serious diseases in women of the lower classes and to stay in the

⁸²Wundt, Erlebtes und Erkanntes, 97.

⁸³Diamond, 20.

university community (and with his mother). He rejected the opportunity to have a less demanding practice in the health spa, because of his embarrassment at having to treat young women of his own social class.

As it happened, Wundt chose the fire instead of the frying pan: his patients at the hospital gave him plenty of trouble. Of the three hospital wards--the surgical, the men's, and the women's--Wundt was sure that his assistantship in the last one was the most unpleasant job. The patients were those unable to pay for medical care, and included factory workers, servant girls, and not a few prostitutes. These latter, whom Wundt referred to as "servants of Venus vulgivana," were kept apart from the rest, but they still managed to make life difficult for the young doctor. In the men's ward, it seemed to him, the patients were quieter, came only if they were very sick, and did not suffer from hysteria. The women, Wundt complained, talked and carried on at all hours. They teased him and were particularly demanding of their resident physician at nighttime.

The events of one evening profoundly influenced Wundt's thinking about the workings of the mind, and perhaps about his own career. After little sleep for several days, he was summoned to the bedside of a typhus patient whose noisy delirium was disturbing the others. To quell the racket, Wundt took a bottle from the shelf. It was not the preparation of opium usually used in such circumstances, but tincture of iodine, which was of course only for topical use. Even though the liquids looked similar, they were clearly labelled and Wundt recalled knowing at

the time that it was iodine. Still he was convinced, in his sleepy state, that it was the appropriate medication. Fortunately, the patient disagreed and spat the poisonous liquid without ingesting much. Wundt immediately told another assistant what had happened and the next morning confessed it to Professor Hasse, who told him not to worry about it.

But Wundt did worry about it. For weeks he wondered whether someone who could make such a mistake should practice medicine. He also recalled the incident in a later essay opposing the use of hypnotism as a method for experimental psychology. He considered his experience an example of auto-suggestion and its effects during a somnambulistic state. To Wundt, the normal mind could not be studied by means of such strange and uncontrolled phenomena.⁸⁴

How could his episode in auto-suggestion to "quiet" the woman--possibly one of those teasing prostitutes--contribute to an investigation of the function of the mind? Such a question would certainly have interested Sigmund Freud, but Wundt did not see it as relevant to his own theories of conscious and unconscious mind.⁸⁵

In the Heidelberg environment, that of his energetic and orderly grandfather, Wundt became a scientist and scholar. When

⁸⁴Wundt, "Hypnotismus und Suggestion," Philosophische Studien, 8 (1893), 1-85; published separately under the same title (Leipzig: Engelmann, 1892) and in revised form under the same title in Wundt, Kleine Schriften, vol. 2 (Leipzig: W. Engelmann, 1911), 426-490.

⁸⁵Cf. Diamond's emphasis on Wundt's sense of inferiority in op. cit., 21.

his father died and his mother was able to devote her attention to him, Wundt's work habits improved and he began to excel. He became self-reliant and fiercely independent of his equals or superiors, i.e., other men. Yet Wundt always relied on a devoted female companion: first his mother, then his wife, finally his unmarried daughter. These three offered both personal and intellectual support to the busy and productive scholar.⁸⁶

Before leaving the clinic in 1856, Wundt did two things that prepared him for an academic career. He carried out experiments on localization of touch sensations on patients with paralyzing nervous diseases, such as encephalitis and meningitis. Combined with experiments on healthy subjects, these observations and experiments formed the basis for his first article on a psychological topic two years later.⁸⁷ In Wundt's succinct account: "The clinic was thus the station along the path of my own experimental work which first led me to psychology, before I ever applied myself thoroughly to philosophical studies." [So war die Klinik die erste Station, die mich auf dem Wege eigener experimenteller Arbeiten zuerst zur Psychologie führte, ehe ich

⁸⁶Curiously, Wundt's autobiography betrays little feeling for these women, especially compared to his discussion of father figures. In this respect, Solomon Diamond is certainly on the right track.

⁸⁷Woodward and Bringmann et al incorrectly follow Schlotte that these were experiments on hysterical patients. Wundt does not mention hysteria in connection with these studies. Bringmann et al, 23; William R. Woodward, "Wundt's program for the new psychology: Vicissitudes of experiment, theory, and system," in The problematic science: Psychology in nineteenth-century thought, ed. William R. Woodward and Mitchell G. Ash (NY: Praeger, 1982), 167-197; 177.

noch mich gründlich mit philosophischen Studien beschäftigt hatte.]⁸⁸ In the course of this research Wundt noted that the experimenter had to be aware that patients may try to play tricks, and that female subjects were particularly inclined to such deception. Fortunately, as Wundt observed, an alert experimenter could usually guard against these difficulties.⁸⁹

While working in the clinic Wundt also published his dissertation [Promotionsschrift] for the doctoral degree from Heidelberg University. He had already passed the state exams in Karlsruhe, and most people in his position simply paid a fee to the library in lieu of the written work. Wundt, however, chose to write a dissertation on nerve pathology and to dedicate it to Hasse.⁹⁰ Wundt admitted that the work reported no major discoveries: it was just a careful anatomical and pathological survey combined with some experiments in the sectioning, grafting and transplanting of tissues. It earned the Dr. med. degree "mit grösstem Lob" and brought an honorable end to his pathological-anatomical studies. Thereafter he began to devote himself fully to physiology.

⁸⁸Wundt, Erlebtes und Erkanntes, 101.

⁸⁹Wundt, Beiträge Zur Theorie der Sinneswahrnehmung (Leipzig: C.F. Winter, 1862), 45.

⁹⁰Wundt, Die Veränderungen der Nerven in entzündeten und degenerierten Organen (Heidelberg: Mohr, 1856).

3. Post-doctoral work in Berlin with Johannes Müller and Emil du Bois-Reymond.

When Johannes Müller accepted Wundt's prize essay for publication in the Archiv, he also sent him an encouraging letter. Armed with this encouragement, the money from his prize essay, and a contribution from his mother, Wundt set out for Berlin to work with Emil du Bois-Reymond and Müller.

Wundt remembered Berlin in the mid-1850s as a "large village." He took a small apartment in the Dorotheenstrasse near the University (the same street, coincidentally, where Berlin's first psychological laboratory opened thirty years later). On a second visit ten years later Wundt would discover that Berlin had in the meantime become an "elegant, impressive large city."⁹¹

Initially Berlin University disappointed Wundt. Scientific laboratories were small, even the famous ones. There was a chemical laboratory open to students, but Gustav Magnus kept his collection of physical instruments, used for demonstrations in lectures, in his own apartment. Only a few students were ever permitted to work with them. By contrast, Philip von Jolly had opened a physical institute in Heidelberg ten years before, and Bunsen by this time had a thriving chemical institute there.

Berlin's famous physiologists enjoyed few amenities in the university. In the winter semester Johannes Müller worked in the old Anatomical Museum and gave instruction in anatomical

⁹¹Wundt, Erlebtes und Erkanntes, 105.

preparations. In the summer semester he used a few rooms in an upper floor of the university building, near the zoological collection. Up a staircase was du Bois-Reymond's "so-called laboratory"--just a corridor where his students worked and a small room for the director. Wundt was the only researcher working with du Bois-Reymond and one of four or five doing anatomical research with Müller.

Wundt was impressed and gratified by the seriousness and intensity with which Müller questioned him about his particular interests. They agreed on a project related to the prize essay: the extirpation of nerve centers in invertebrates, particularly mussels. This research came to a dead end when Wundt was unable to exercise control over muscular processes, and no publication resulted.

The flamboyant du Bois-Reymond introduced him to a topic of more current interest: the controversy between Eduard Weber of Leipzig and A.W. Volkmann of Halle concerning the variability of muscle contraction under stress of weights. Wundt proposed a new method for investigating the problem. He used living frogs and stimulated nerves that were relatively undamaged. In late 1856, Wundt submitted to Müller's Archiv an article that generalized this method to all elastic organic tissues.⁹² The studies on muscles were later expanded into Wundt's first book, published after he returned to Heidelberg.

⁹²Wundt, "Ueber die Elasticität feuchter organischer Gewebe," Archiv für Anatomie, Physiologie und wissenschaftliche Medicin (1857), 298-308.

Even though university facilities were less than Wundt expected, he was impressed by a number of important intellects in Berlin, and especially by Johannes Müller, who, the year after Wundt studied with him, died at age fifty-six. Müller was the "most versatile and original [genial] physiologist of his time" and the most perfect example of a member of Berlin's learned society, "with his earnest tenacity [Geschlossenheit] and his amazing versatility."⁹³ Writing his memoirs in extreme old age, Wundt identified himself with this father of German physiology rather than with du Bois-Reymond, who probably had actually been more helpful to him. Wundt wanted to think of himself as "many-sided" like Müller, rather than single-minded like Du Bois-Reymond, the consummate reductionist in physiology. In the next three decades Wundt would try to follow the Müller pattern in academic psychology, resisting the tendency toward specialization and reductionism. This had consequences for his place in the history of psychology. Younger experimentalists especially considered his generalist approach outmoded.

C. Early career: physiology and politics, 1857-1869.

1. Illness and a bad start teaching; the first book is not successful.

The return to Heidelberg marked the beginning of Wundt's

⁹³Wundt, Erlebtes und Erkanntes, 113-114.

academic career as a physiologist, a period characterized by Titchener as "seventeen years of depression."⁹⁴ In fact, these were very productive years for Wundt in spite of hardships and uncertainties.

Right away he needed to do two things: habilitate as Privatdozent and publish, as all Privatdozenten were expected to do. Wundt planned to write an article on the localization studies he had done in Hasse's clinic and also to publish the research on muscle contraction that he had begun in Berlin. The habilitation was very easy, as Wundt later recalled. With the doctoral degree summa cum laude, he was not required to take written or oral habilitation exams, and his doctoral dissertation was accepted as the habilitation essay. There remained only the formality of the public disputation. Wundt and three of his friends worked out a dramatic discussion in which Wundt would finally triumph. After the "performance" they had a festive meal, and the next day Wundt announced his course offering on the bulletin board.

Wundt's first lecture course did not go well. With great enthusiasm, he undertook to teach general physiology, six hours per week with demonstrations and experiments. As he later realized, he simply made too much work for himself, especially since only four students were enrolled. One morning, during his lecture, he had a "sudden hemorrhage," which continued throughout the day. The physician thought that death was probable, so

⁹⁴Edward B. Titchener, "Wilhelm Wundt," American journal of psychology, 32 (1921), 161-178; 171n.

Wundt's brother Ludwig, then a legal official in Mannheim, was summoned to the sickbed. Although Wundt's memoirs do not specify the reason for the hemorrhage, it was almost certainly tuberculosis.⁹⁵

Wundt recalled the episode as a profound experience of "perfect tranquility"; it probably affected his career and research interests. The interconnectedness and even unity of scientific and philosophical knowledge came as a revelation to Wundt as he thought death was approaching. He was vividly conscious of his predicament and of his philosophical outlook as he lay there, and that consciousness stood in ironic contrast to his unconscious action in the "iodine affair."

To avoid a relapse, Wundt had to regulate his life, habits, schedules, and interests. Late in life Wundt confessed to a student, afflicted by the same illness, that this serious attack had not been his first, that he had failed to heed warning signs and had continued to overwork until he became severely ill.⁹⁶ Probably upon the advice of his uncle, Freidrich Arnold, who had taught at Zürich University, Wundt retreated to the mountains near that city, hoping to speed his recovery. He even devised an oxygen mask to aid his breathing.⁹⁷

⁹⁵This is the diagnosis by Bringmann et al, 25.

⁹⁶Wundt to Friedrich Sander, 18 March 1915, UAL, Wundt Nachlass, Nr. 1430a1.

⁹⁷Felix Schlotte, "Beiträge zum Lebensbild Wilhelm Wundt aus seinem Briefwechsel," Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschafts- und sprachwissenschaftliche Reihe, 5 (1955/56), 333-349; 334. Hereafter Schlotte.

The need for rest and for restrictions on his activities did not force Wundt to retreat from his career plans. On the contrary, his regimen probably helped him to concentrate and exercise control over the scope of his research, abilities which were valuable for the young man who was to develop a reputation for synthetic scholarship.

Wundt's first book was a monograph, though, not a synthetic work. During his recovery, he put finishing touches on this study of muscle movement. The preface is dated October 1857, just a half year after the attack. Wundt dedicated the book to du Bois-Reymond.⁹⁸ The Berlin physiologist sent a polite note of thanks, but Wundt suspected that he never took the time to read it.⁹⁹ Wundt surmised that the leader of the reductionist school of physiology was not pleased by his preface, which acknowledged the importance of mechanical explanation but criticized extreme reductionism in physiology. Wundt's attitude toward his Berlin teacher supports Diamond's argument about his fiercely independent feelings towards father figures.

The Halle physiologist, A.W. Volkmann, also sent a letter thanking Wundt for the book and commending him for using live frogs to test elasticity of muscles. Volkmann was gratified that Wundt's results supported his own theory rather than that of Eduard Weber in Leipzig, and he sent Wundt a copy of the latest

⁹⁸Wundt, Die Lehre von der Muskelbewegung, nach eigenen Untersuchungen bearbeitet (Braunschweig: Vieweg, 1858).

⁹⁹Emil du Bois-Reymond to Wundt, [1858], quoted in Schlotte, 335. Wundt, Erlebtes und Erkanntes, 147.

article in his extended debate with Weber.¹⁰⁰ In spite of Volkmann's compliments, Wundt was left with the impression that his book was poorly received and he blamed the poor reception on du Bois-Reymond.¹⁰¹ Wundt stated that the relative failure of his first book taught him two things: let students be as independent as possible, and try never to be the head of a school [Schulhaupt].¹⁰² Diamond finds these assertions to be ridiculous in light of Wundt's later actions and his reputation with some of his students. However, Wundt would repeatedly claim that he led no "school" of psychology, and he often praised his students for their independence, even if he also harshly criticized their writings.

2. Assistant to Helmholtz and mixed success as a physiologist.

As Wundt recovered his health, he began to make progress on several fronts. Most significantly, he became assistant to Hermann Helmholtz. Friedrich Arnold's chair for anatomy and physiology at Heidelberg had been divided into two, and Bunsen helped convince Helmholtz to become professor of physiology and director of a new physiological institute. Helmholtz, who was at the time professor of anatomy and physiology at Bonn, was happy to leave anatomy behind. Helmholtz had already achieved fame in

¹⁰⁰A.W. Volkmann to Wundt, 15 May 1858, UAL, Wundt Nachlass, Nr. 1535.

¹⁰¹The mixed reviews are discussed by Diamond, 26.

¹⁰²Wundt, Erlebtes und Erkanntes, 148.

several fields. His essay on conservation of energy, though physicists had hesitated to accept it when it appeared in 1847, had become a classic. In 1850 Helmholtz devised a way to measure the speed of nerve propagation in a frog's leg and found the speed to be considerably slower than previously supposed. The next year he invented the ophthalmoscope. In 1856 Helmholtz published the first volume of his three-part treatise on physiological optics. At the time he moved to Heidelberg, he was working primarily on sensory physiology.

In February of 1858, while Helmholtz was still negotiating with Heidelberg University, Wundt applied to be his assistant. Helmholtz did not answer until August, when the plans for his institute were firmer. He told Wundt that the pay would be only 300 gulden annually, because the post was intended for a medical student just finished with exams who would count the experience as part of the pay. Helmholtz detailed some of the duties. The assistant would have charge of those physiological exercises that took too long to demonstrate in lectures. He would also give courses on microscopic anatomy--Helmholtz's chronic headaches prevented him from taking an active part in histological research, so he wanted to avoid lecturing on that topic. Finally, the assistant should open the institute at regular hours and be available for consultation. During that time he could probably find time to do his own research. All in all, it was not a particularly attractive position for a physiologist--Helmholtz made that clear. He agreed,

nevertheless, to hire Wundt, if Wundt still wanted the job.¹⁰³

Why did Helmholtz hire Wundt? Wundt, who had studied under Johannes Müller and du Bois-Reymond, came with appropriate credentials. In hiring Friedrich Arnold's nephew, Helmholtz made a politic gesture of collegiality. Perhaps the most compelling reason was that Wundt knew Heidelberg--Helmholtz's letter offering the assistantship also sought Wundt's advice on choosing a custodian for the institute.

Wundt's work in the Heidelberg Physiological Institute was at first very demanding. The Baden government, partly to justify the expense of Helmholtz's new institute, required every candidate for state medical examinations to complete a laboratory course in experimental physiology. Wundt complained that keeping the institute open from eight to twelve each morning, left him no time for his own research. The demands of anxious medical students eventually subsided, however, as they realized that stimulating frog muscles, sectioning nerves, and concocting artificial digestion gave them little help in examinations or in medical practice. The laboratory exercises then became more a matter of routine.

Wundt never actually worked with Helmholtz. Even though he was director of an institute, he developed no "school" there, as did du Bois-Reymond in Berlin or Carl Ludwig in Leipzig. Ivan Sechenov, who studied in the Heidelberg Physiological Institute

¹⁰³Hermann Helmholtz to Wundt, 5 August 1858, quoted in Schlotte, 335-336. Diamond, 29, incorrectly gives the date of this letter as 5 May 1858.

from spring 1859 to spring 1860, remembered it as very small: Helmholtz had his own room, and the only other was shared by Sechenov, a fellow Russian, Wundt and two other Germans. Wundt sat at his books every day and never said a word to anyone, Sechenov recalled: "I did not once hear his voice." Every morning Helmholtz made rounds like a hospital physician, asking each participant about the progress of his work. Then he went into his room and shut the door.¹⁰⁴ In spite of the chilly atmosphere in the institute, the proximity to Helmholtz, Bringmann et al suggest, probably inspired Wundt's work.¹⁰⁵ While continuing research on electrophysiology, Wundt began to work more intensely on sensory physiology, an interest he shared with Helmholtz. The latter's anatomical-mechanical study of musical tone perception appeared in 1863, and the third, most psychological and philosophical volume of Handbuch der physiologischen Optik was published in 1867.¹⁰⁶

Wundt claimed in 1920, perhaps with the clarity of hindsight, that he and Helmholtz had always taken opposite approaches in sensory studies. Helmholtz wrote on physiological optics with the intention of removing as many of its aspects as

¹⁰⁴I.M. Sechenov, Autobiographical notes, ed. Donald B. Lindsley, trans. Kristan Hanes (Washington, D.C.: American Institute of Biological Science, 1965), 89.

¹⁰⁵Bringmann et al, 26-27.

¹⁰⁶Hermann Helmholtz, Die Lehre von den Tonempfindungen als physiologische Grundlage für die Theorie der Musik (Braunschweig: Vieweg, 1863); Handbuch der physiologischen Optik, 3 vols. (Hamburg: Voss, 1867), first published in three parts: 1856, 1860, and 1866.

possible from philosophical psychology, and of placing them within the purview of natural science. Wundt, by contrast, wanted to claim perception as a psychological problem from the outset, and perceptual studies led him in the direction of more general studies of psychology.¹⁰⁷ In other words, Wundt was not challenging Helmholtz in physiology; rather he was challenging the limitation of perceptual studies to the physical approach.

Besides his series on sensory perception, Wundt published articles in the early 1860s on special problems in physiological optics and electrophysiology. In both areas, he fell into controversies with physiologists of his own generation, and emerged from battle the worse for the wear. The controversy with Hermann Munk (1839-1912) began in 1859, when Wundt reported his discovery of "secondary modification of nerves," an increased irritability of a peripheral nerve upon repeated electrical stimulation. Munk pointed out that the phenomenon had been reported already by several researchers, and that the effect was due to a gradual change in an excised nerve, not to the repetition of stimulation itself. Wundt's attempt to defend his views met with little success.

Another controversy during Wundt's early career involved a problem of current concern to Helmholtz and other vision researchers. Wundt had proposed a mathematical model for the horopter, the locus of points whose images are formed on corresponding places of the two retinas and which are therefore

¹⁰⁷Wundt, Erlebtes und Erkanntes, 161.

seen as a single image. He even published it in Annalen der Physik und Chemie to give it the broadest possible audience. The excellent observer, Ewald Hering, found problems with Wundt's approach and, a matter of great embarrassment to Wundt, a mathematical error in one of Wundt's articles. In the end, Hering and Helmholtz solved the problem of the horopter, and thus superseded Wundt's analysis. By 1864, only a few years after the physiologists had virtually ignored his work on muscle contraction, Wundt had thus been defeated in controversies in both electrophysiology and physiological optics as well.

Wundt left Helmholtz's laboratory in 1864.¹⁰⁸ The assistantship, he explained, simply took too much of his time. After his promotion in 1864 from Privatdozent to Professor Extraordinarius (though without salary), Wundt decided to earn his gulden writing textbooks. He also constructed a small physiological laboratory in the apartment he shared with his mother.

Since the embarrassing episode of the mathematical error coincided with Wundt's departure from Helmholtz's laboratory, it is not surprising that some saw a causal relationship between the two events. Diamond raises the possibility that Wundt lost the assistantship because Helmholtz wanted to hire one of du

¹⁰⁸It is not clear exactly when Wundt left Helmholtz's institute. Diamond, 46, is probably correct to give 1864, but his reasons are confusing. Erlebtes und Erkanntes gives no ending date. Schlotte, 335, gives 1863, and Bringmann et al, 25-26, give the end of academic year 1864-65, though without clear documentation. Since a new assistant arrived in 1864 and Wundt was appointed Extraordinarius that year, this seems the likely year in which he left his assistantship.

Bois-Reymond's students who had excellent skills in mathematics and physics. Certainly Julius Bernstein (1839-1917), Wundt's successor, fits that description: he later applied Wilhelm Ostwald's ionic theory to an explanation of the physico-chemical mechanism for nerve-muscle action, a problem which had long eluded solution by du Bois-Reymond and his other students.¹⁰⁹

It seems more likely, however, that Wundt was ready to leave the position after so many years. It paid very little, considering the work involved. Moreover, Wundt was clearly spending less time with physiology and more time reading philosophy. Indeed, shortly after leaving the Physiological Institute, he wrote his first philosophical book, a study of the axioms of physics, which appeared in 1866.¹¹⁰

As an Extraordinarius with no specific obligations, Wundt found time for reading philosophy, writing textbooks, reviews and popular articles, and taking active part in social and political organizations.

3. Teaching and writing textbooks.

While at Heidelberg Wundt gave courses every semester, once he recovered his health.¹¹¹ He dutifully taught microscopic

¹⁰⁹Timothy Lenoir, "Models and instruments in the development of electrophysiology, 1845-1912," Historical studies in the physical and biological sciences, 17:2 (1986), 1-54.

¹¹⁰Wundt, Die physicalischen Axiome und ihre Beziehung zum Causalprinzip. Ein Capitel aus einer Philosophie der Naturwissenschaften (Erlangen: F. Enke, 1866).

¹¹¹The list of Wundt's lectures is given in Eleonore Wundt,

anatomy six times for Helmholtz between 1858 and 1863. He gave courses in the use of physical instruments and physiological ideas in medical practice--"medical physics," as it was called (1857-1860, three times). He also taught reproductive physiology (1861-1864, three times) and either a course on general physiology or a laboratory course in experimental physiology almost every year from 1857 to 1874. These courses were typical responsibilities for a physiologist on a medical faculty.

Wundt extended his lectures into several other areas, including psychology, by taking advantage of the tradition of Lehrfreiheit in German universities, which in theory meant that a Dozent could teach any subject he wanted. As an unsalaried Privatdozent and Extraordinarius, Wundt's pay for teaching came entirely from the fees paid by students who enrolled in his lectures. In winter-semester 1859-60, Wundt offered his first course in "Anthropology (natural history of mankind)." Wundt taught at least one course called either anthropology or ethnography nearly every year at Heidelberg. The former was standard fare for the medical students.

In summer-semester 1862, Wundt taught a course entitled "Psychology from the standpoint of the natural sciences [Psychologie vom naturwissenschaftlichen Standpunkt]." Psychology lectures were nothing unusual in themselves, but Wundt may have been the first physiologist to offer them. Generally it

Wilhelm Wundts Werk, ein Verzeichnis seiner sämtlichen Schriften (Abhandlungen der sächsischen staatlichen Forschungsinstitute. Forschungsinstitut für Psychologie, Nr. 28) (Munich: Beck, 1927), 69-71.

was philosophers who took up the subject, treating it as a survey of theories of mind. Aware of the uniqueness of his approach, Wundt published his lectures the following year. This, his third book, ranged--and rambled--over physiology, biology, and anthropology. When Wundt revised and condensed it years later, he described the first edition as a "youthful sin" [Jugendsünde].¹¹²

Wundt's physiology textbooks were more successful. Perhaps through Helmholtz's arrangements with the publisher,¹¹³ Wundt wrote two textbooks--one on human physiology, the other on "medical physics"--which sold very well and quickly went into revised editions and translations.¹¹⁴

Wundt also wrote articles for popular magazines. This activity brought him into contact with social organizations and eventually led to his election to political office.

4. Popular lectures and politics, 1862-1869.

Wundt's political activities while at Heidelberg have received much attention. Ernst Meumann mentioned them in a biographical sketch in 1912, just to show that Wundt was "no one-sided philosopher."¹¹⁵ Understandably, Wundt emphasized his

¹¹²Wundt, Vorlesungen über die Menschen- und Thierseele, 2 vols. (Leipzig: Voss, 1863). 2nd ed., 1 vol., 1892.

¹¹³Bringmann et al, 26.

¹¹⁴Wundt, Lehrbuch der Physiologie des Menschen (Erlangen: F. Enke, 1864-65); Handbuch der medicinischen Physik (Erlangen: F. Enke, 1867). See Eleonore Wundt, Wilhelm Wundts Werk, for a listing of editions and translations.

¹¹⁵Ernst Meumann, "Wilhelm Wundt zu seinem achtzigsten

political involvement in his autobiography, which appeared shortly after World War I. Wundt's association with liberal causes, his attitudes toward public education, and, probably most important, his decision to leave politics and devote his undivided attention to academic research are the essential themes in the period 1862-1869. His political work provided him with contacts that, curiously enough, may also have facilitated his first appointment as full professor.

Wundt's participation in these activities probably began in 1856, with the founding of the Natural History and Medical Club [Naturhistorisch-medicinischer Verein] at Heidelberg. Wundt was a charter member of the organization, of which Helmholtz later became chairman.¹¹⁶ The club's members were mostly young Dozenten, who had been teenagers during the Revolution of 1848, and they held progressive ideas about public education. In line with these ideas, by 1861 Wundt was contributing articles on scientific subjects to liberal magazines. His short pieces for a magazine called Fireside conversations, for example, included discussions of eye movement, of tastes and smells, and of the concept of time.¹¹⁷ To the popular magazine Gartenlaube Wundt

Geburtstag," Deutsche Rundschau, 152 (1912), 193-224; 198.

¹¹⁶Wundt, Erlebtes und Erkanntes, 236; Wolfram Meischner and Erhard Eschler, Wilhelm Wundt (Leipzig: Urania, 1979), 34. The document reproduced here gives Wundt as a charter member on 24 October 1856, but is signed by Helmholtz as chairman on 4 October 1864.

¹¹⁷Wundt, "Der Blick, eine physiognomische Studie," Unterhaltungen am häuslichen Herd, 3rd series 1 (1861), 1028-1033; "Der Mund, eine physiognomische Studie," ibid., 2 (1862), 505-510; "Die Zeit," ibid., 590-593.

contributed articles on the "speed of thought" and "how death came into the world."¹¹⁸ Some of Wundt's psychological ideas--regarding experimental psychophysics and mental chronometry as well as anthropology--were thus first presented in popular publications.

By 1862, Wundt had increased his involvement in social causes. He joined a group of young Privatdozenten in a Workers' Educational Association [Arbeiterbildungsverein], one of many such organizations founded at that time by liberal, middle-class intellectuals throughout Germany. Wundt himself was not directly involved in educating workers. Rather, he helped raise money for constructing a workers' center, by giving lectures before polite society--people who would pay to have young scholars and scientists inform and entertain them with the latest in research.

Wundt recalled two occasions which give the flavor of these lectures. In Pforzheim he lectured on conservation of energy to an audience of senior citizens. After he summarized Helmholtz's essay on the sources and conversion processes of different forms of energy, one gentleman asked if the theory explained why he felt energetic after sitting in the sun. In Baden-Baden, Wundt tried to enlighten spa guests on Darwin's theory of evolution. Since there were women in the audience, the entertainment director admonished him not to show his pictures of ape and human embryos.¹¹⁹

¹¹⁸Wundt, "Die Geschwindigkeit des Gedankens," Gartenlaube, Nr. 17 (1862), 263-265; "Wie der Tod in die Welt kam," ibid., Nr. 24 (1863), 383-384.

¹¹⁹Wundt, Erlebtes und Erkanntes, 16-17.

Wundt was elected to the chair of the Heidelberg chapter of the Arbeiterbildungsverein in 1863, and his duties included travel to regional meetings. At one meeting he met the liberal democrat Friedrich Albert Lange (1828-1875)--a noted scholar, as well as a politician. Lange's History of materialism (1866) stimulated the Neo-Kantian movement in philosophy. In 1869 the democratic administrators of Zürich University created a chair of "inductive philosophy" for Lange. Some ten years after their meeting at the political assembly, Wundt succeeded Lange in Zürich.

The enthusiasm of liberal intellectuals for worker education waned as workers began to organize themselves under the influence of agitators like Ferdinand Lassalle and to arm themselves with the ideas of Karl Marx. As the workers began to reject the efforts of their bourgeois benefactors, Workers' Educational Associations [Arbeiterbildungsvereine] dissolved, and labor organizations [Arbeitergenossenschaften] formed. This was the point in time when Wundt shifted to a more conventional political path and sought election to the legislature.

From the chair of the Heidelberg Association to a member of the Baden diet was, Wundt wrote, "no terribly large step [kein allzu grosser Schritt]."¹²⁰ When the death of a fellow Heidelberg Privatdozent freed a seat in the Baden Diet, Wundt's friends convinced him to stand for it. In April 1866, Wundt was elected to the Second Chamber of the Diet, which met in nearby Karlsruhe.

¹²⁰Wundt, Erlebtes und Erkanntes, 19.

To dispel the reactionary atmosphere of the 1850s, Baden liberals were busily rewriting legal and administrative codes. Wundt, for example, helped draft legislation which abolished the traditional privileges of universities to operate their own criminal courts, and he also worked to secularize public elementary schools--both were decidedly liberal causes at the time.¹²¹

The German national situation was undergoing rapid, sometimes bewildering change while Wundt was a member of the Diet. As he took office in 1866, the majority liberal factions banded together in the "Badische Fortschrittspartei," in order to present united opposition to Prussia's belligerence toward Austria. When war broke out, Austria ostensibly had allies in the rest of the German Confederation, but, in fact, she was alone. Wundt noted that popular political sentiment quickly turned pro-Bismarck after the first, decisive battle at Königgrätz.¹²² The peace ending the Austro-Prussian War was signed before seven weeks had passed, and Prussia took control of the destiny of central Europe. Baden, a formal ally of Austria during the short war, was an "unwanted child" [verstossenes Kind] from 1866 to 1870.¹²³

Diamond describes Wundt as a pro-Prussian, anti-democratic German nationalist, but it is more accurate to say, with Wundt's biographer Peter Petersen, that he was a typical southern-German

¹²¹Wundt, Erlebtes und Erkanntes, 20.

¹²²Wundt, Erlebtes und Erkanntes, 27.

¹²³Wundt, Erlebtes und Erkanntes, 29.

democrat of the period.¹²⁴ In the late 1860s, he soberly recognized that exclusion from the Prussia's North-German Confederation was detrimental to Baden--she was too small to exist as an independent state between France and Prussia-Germany.

In the midst of this political tension, Wundt left politics in mid-1869. His official grounds for resigning were his wish to return to full-time academic work and the completion of his legislative work.¹²⁵ Personal factors, however, must have played a role in the decision, too. Wundt's mother died in 1868, and Wundt became engaged at about the same time. On his own and eager to support a wife, Wundt had to take stock of his career progress.

D. Wundt specializes in psychology, 1862-1874.

1. The way to psychology: Wundt's letters to his fiancée.

In two letters to Sophie Mau (1844-1912), shortly before their marriage, Wundt frankly assessed his career to that point.

He had begun, he explained, with the study of medicine, but then decided to pursue theoretical science as a physiologist.

¹²⁴Peter Petersen, Wilhelm Wundt und seine Zeit (Frommanns Klassiker der Philosophie, vol. 13) (Stuttgart: Frommanns, 1925), 27.

¹²⁵Wundt resigned on 4 July 1869: see newspaper announcement reproduced in Wundt studies, a centennial collection, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 344.

In a few years I would surely have had the good fortune to have reached the harbor of a secure academic profession. But . . . I have little practical sense, and am little inclined always to do that scientific work which happens at the time to be useful in attaining a superficial position [die Gewinnung einer äusseren Stellung]. Rather I am inclined in science, as in life, to follow my free interest more than normal worldly wisdom approves. My physiological work led me unintentionally to philosophical studies. Moreover, being not particularly gifted in winning the favor of influential personalities, I was described everywhere an academic position opened--and I could have predicted this--as someone who was disloyal to his discipline. I really should not be upset with people who wanted to have an upright, specialized professor. They would have to hesitate about someone whom they feared would also not hold to assigned boundaries in his teaching. Yet even these obstacles would have been overcome by working vigorously onward.

Wundt made his life even more complicated, however, by becoming involved in politics, while suffering from a serious illusion.

I had believed that politics should not be a special profession but that men of all walks of life should participate in public affairs. Soon, however, I could no

longer suppress the conclusion that the political, as well as every other profession demands the whole man, and that when one nevertheless tries to combine careers, only a splintered efficacy results, satisfying neither side. As I took my leave from you in the spring of 1868, I had already made the decision to return to scientific work totally and exclusively, and soon afterward I did that.

You see, my biography is a web of errors, which I can from time to time recognize, after they have been committed, without being able to guard against new errors. But during all this time of various mishaps, brought through my own fault, luck has stood by me in one thing: it has always been possible for me to make enough money through my writing so that I could live reasonably and independently, and sometimes even could spare a little time for larger scientific publications.

[Hier würde es mir denn wohl nach einigen Jahren geglückt sein, der Hafen eines gesicherten akademischen Berufs zu erreichen. Aber . . . ich habe wenig praktischen Sinn, bin wenig dazu angetan, auch wissenschaftlich immer das zu betreiben, was für die Gewinnung einer äusseren Stellung gerade nützlich ist, sondern bin ich in der Wissenschaft wie im Leben, mehr als es die gewöhnliche Lebensklugheit billigt, geneigt,

meinem freien Interesse zu folgen. Meine physiologischen Arbeiten führten mich unversehens auf philosophische Studien. Ohnehin nicht besonders befähigt, die Gunst einflussreicher Persönlichkeiten zu gewinnen, wurde ich nun, wie ich es mir hätte voraussagen können, überall, wo es sich um die Besetzung einer akademischen Lehrstelle handelt, als ein von seinem Fach Abtrünniger bezeichnet. Den Leuten, die einen regelrechten Fachprofessor haben wollten, dürfte ich's ja im Grunde nicht übel nehmen, wie sie sich vor einem solchen scheuten, von dem sie fürchten könnten, dass er auch im Unterricht die ihm zugewiesenen Grenzen nicht einhalten werde. Doch diese Hindernisse wären wohl durch rüstigen Weiterarbeit bald überwunden gewesen ...

Ich hatte geglaubt, dass die Politik nicht ein spezifischer Beruf sein solle, sondern dass Männer aller Lebenskreise an den öffentlichen Angelegenheiten des Landes teilnehmen müssten. Bald konnte ich mich aber der Überzeugung nicht mehr verschliessen, dass die politische so gut wie jede andere Stellung ihren Mann ganz fordert und dass, wo dennoch eine Vereinigung versucht wird, nur eine zersplitterte, nach keiner Seite befriedigende Wirksamkeit zustande kommt. Als ich im Frühjahr 1868 von Ihnen Abschied nahm, stand der Entschluss bereits fest, ganz und ausschliesslich zur wissenschaftlichen Arbeit zurückzukehren, und ich habe

ihn bald darauf ausgeführt.

Sie sehen, mein Lebenslauf ist ein Gewebe von Irrtümern, die ich zuweilen einsehe, nachdem sie begangen sind, ohne dadurch vor neuem Irren geschützt zu sein. Nur in einem ist mir in aller dieser Zeit mancherlei selbstverschuldeten Missgeschicks das Glück einigermaßen treu geblieben: es ist mir immer möglich gewesen, durch literarische Arbeit so viel zu erwerben, dass ich erträglich und unabhängig existieren, manchmal auch einiges zu grösseren wissenschaftlichen Ausgaben erübrigen konnte.]¹²⁶

The next month, Wundt reassured his future bride that he planned to be more than just a hack textbook writer.

As regards my fame with the medical men, there is really not much to that. I am known to them through a few textbooks, which are for me much what lens grinding was for the great philosopher Spinoza: I need this sideline in order to maintain a living . . . My own scientific work, I mean that which concerns science and not livelihood, moves into the border area between physiology and philosophy, which at first does not bring

¹²⁶Wundt to Sophie Mau, 27 May 1872, quoted in Wolfram Meischner and Erhard Eschler, Wilhelm Wundt (Leipzig: Urania, 1979), 40-42.

much superficial honor. Do not think, however, that I want to give the impression that I am not ambitious. On the contrary, I am very ambitious and have big plans in my pocket. I myself consider physiology only as a stage of preparation, in order to build various bridges out of corporeal life, with which this science has to do, over to mental life. He who treads new paths must of course forego the advantage of reaching his goal with certainty in a measured amount of time; he cannot have an eye to fine superficial position and all that it brings with it. But I am little deflected by these matters, actually; for I am simply too ambitious to be vain.

[Was meiner Ruhm bei den Medizinem betrifft, so hat es damit wirklich nicht viel auf sich. Ihnen bin ich durch einige Lehrbücher bekannt, mit denen es mir ergeht wie dem grossen Philosophen Spinoza mit dem Brillenschliefen, ich muss das als eine Nebenbeschäftigung betreiben, die zum Lebensunterhalt erforderlich ist . . . Meine eigentlichen wissenschaftlichen Arbeiten, diejenigen nämlich, bei denen es sich um die Wissenschaft und nicht um den Broterwerb handelt, bewegen sich aber meistens auf einem dem ehrsamem Fachgelehrten verdächtigen Grenzgebiet zwischen Physiologie und Philosophie, auf dem sich vorerst nicht viel äussere Ehre gewinnen lässt. Glaube deshalb ja nicht, ich wolle mir den Schein geben, nicht

ehrgeizig zu sein. Im Gegenteil, ich bin sehr ehrgeizig und ich habe grosse Pläne in der Tasche. Die Physiologie betrachte ich selbst nur als eine Vorbereitungsstufe, um aus dem körperlichen Leben, mit dem es diese Wissenschaft zu tun hat, verschiedene Brücken ins geistige Leben hinüber zu schlagen. Aber wer neue Wege wandelt, der muss eben auch auf den Vorteil, sein Ziel in gemessener Entfernung mit Sicherheit zu erreichen, verzichten, glänzende äussere Stellung und alles, was darum und daran hängt, darf er nicht im Auge haben. Mich scheren diese Dinge in der Tat wenig; denn ich bin eben zu ehrgeizig, um eitel zu sein.]¹²⁷

Wundt's assurances must have sufficed. The couple married later that same year, 1872. He was forty; she was twenty-eight. At year's end, Wundt wrote a letter to Wilhelm Engelmann, publisher in Leipzig,¹²⁸ making a proposal for a "larger scientific publication" that in fact helped him obtain "superficial honor and position." Wundt's road to the publication of his important text on experimental psychology, Gründzüge der physiologischen Psychologie, had been a long one.

¹²⁷Wundt to Sophie Mau, 15 June 1872, quoted in Wolfgang Meischner and Erhard Eschler, Wilhelm Wundt (Leipzig: Urania, 1979), 58-59.

¹²⁸Translated in S. Feldman, "Wundt's psychology," American journal of psychology, 44 (1932), 615-629. Reprinted in Wilhelm Wundt and the making of a scientific psychology, ed. Robert W. Rieber (NY: Plenum, 1980), 207-227; 208.

2. Wundt's study of psychology in the 1850s and 1860s.

Wundt's first study in psychology was the investigation in Hasse's clinic in 1856 of tactile localization on patients with paralyzing diseases. His observations led him to suspect that E.H. Weber's anatomical interpretation, that a grid of sensory receptors directly translated information to the mind, did not properly take into account the central nervous system's activity in the process. Wundt noticed that patients who falsely located stimuli to the shin, when the soles of the feet had actually been stimulated, consistently registered degrees of discrimination characteristic of skin on the shins, rather than on the feet. Moreover, Wundt discovered that the patients' visual images of their body parts played an important role in these false localizations. Even in healthy subjects, the mind could have remarkable influences on perceptual tasks--especially when it combined information from different senses. Straightforward psychophysical studies could determine sensory limits and capacities, Wundt realized, but ultimately perception was under psychological control.

Starting with that realization, Wundt developed a psychological interpretation of Fechner's psychophysics, emphasizing central nervous control over peripheral sensory functions. Wundt made Fechner's Psychophysical Law a special case of his general Law of Psychic Relativity. The mind always compares a sensation with other sensations; the relative

relationship is psychological (between sensations), rather than psychophysical (between stimulus and sensation).

Besides comparing, the mind can also combine multiple simple sensations into a higher perception through "creative synthesis" [schöpferische Synthese]. Wundt claimed that this concept came to him in a flash of insight during a walk on the Gaisberg near Heidelberg in the summer of 1858 or 1859. He saw it as a solution to the empiricist-nativist debate on visual space perception.

Nativists, such as Johannes Müller, following certain results of Kant's philosophy, assumed that some knowledge, in particular that of time and space, had to be innate. Empiricists, such as Helmholtz and Lotze, disliked such a supposition and tried to formulate ways in which perception of three-dimensional space could be explained sufficiently by experiences of sensations. In the case of vision, their explanation involved connections between retinal images and perceptions of eye movements. Because the mind is capable of "creative synthesis," Wundt thought, perceptions of retinal images and those of eye movement can be combined into a new perception, visual space, which is different than the sum of the parts. This solution kept Wundt in the camp of the empiricists, since he did not assume that knowledge of space pre-existed in the mind. Wundt assumed something about mental activity, but not about mental content.

Having given feelings of muscular movement such an important role in vision, Wundt made a study of eye muscles and built a

model of the visual muscle system, the ophthalmotrope (see Figure 2.1). He published this work in the leading journal for ophthalmology.¹²⁹ Although his ideas on space perception did not attract much attention, Wundt's ophthalmotrope was a success.

In the 1850s and 1860s, Wundt's writing described the synthetic act in this way: different sensations are logically combined by "unconscious inferences" into a synthetic perception--for example, three-dimensional visual space or localization of a tactile stimulus.

These basic concepts were present in six articles Wundt published as "Beiträge zur Theorie der Sinneswahrnehmung," from 1858 to 1862.¹³⁰ The first article, on the tactile studies from Hasse's clinic, introduced the term "unconscious inference." The second article was a history of theories of vision. The third article was a study of monocular vision and the role of feelings of muscular movement. The fourth and fifth articles described binocular vision; they presented Wundt's solution for the horopter, his explanation of how the mind "synthesizes" perception of space, and a discussion of optical illusions. In the sixth article, Wundt criticized Herbart's treatment of time in mental processes. He rejected Herbart's notion that rival ideas could exist in consciousness simultaneously, and he defined

¹²⁹Wundt, "Über die Bewegung des Auges," Archiv für Ophthalmologie, 8 (1862), 1-87; "Beschreibung eines künstlichen Augensystems zur Untersuchung der Bewegungsgesetze der menschlichen Auges im gesunden und kranken Zustand," ibid., 88-114.

¹³⁰Appeared in Henle und Pfeufers Zeitschrift für rationelle Medicin.

consciousness as the momentary synthesis of unconscious percepts.

This article previews Wundt's later work on "speed of thought" and reaction time.

When the Beiträge were bound into a single volume in 1862,¹³¹ Wundt added an introductory essay which stands as his first programmatic statement of a research plan for psychology. Psychology, he claimed, had not advanced since Aristotle. Its practitioners continue to take data directly from introspection [Selbstbeobachtung] and then use these data to build metaphysical systems of mind. What was needed, Wundt contended, was a revolution in methods. The traditional psychological method of self-observation had to be supplemented by experimental studies of perception in individuals and by historical data.¹³²

These three methods--self-observation, experiment, and historical studies--would elucidate the functions of unconscious mental processes which give rise to conscious actions. Researchers could use the methodology to discover the mechanisms of normal perception and the sources of mental errors such as optical illusions. Wundt envisioned the three methods operating together to describe and explain psychological processes. In his first comprehensive work on psychology, however, Vorlesungen über Menschen- und Thierseele, published the year after Beiträge, the

¹³¹Wundt, Beiträge zur Theorie der Sinneswahrnehmung (Leipzig: C.F. Winter, 1862).

¹³²Henry Thomas Buckle's statistical sociology in History of Civilization in England (2 vols., 1857, 1861) portrayed a scientific approach to history that attracted considerable attention. See Solomon Diamond, "Buckle, Wundt, and psychology's use of history," Isis, 75 (1984), 143-152.

difficulties inherent in using all the methods at once became all too evident.

3. Wundt's shift from psychology of the unconscious to psychology of conscious action.

In the period from 1863 to 1873, Wundt gradually separated, methodologically and operationally, the historical-sociological approach from the approach combining self-observation and experiment. Wundt himself never admitted, nor perhaps even recognized, that he had made a fundamental shift, but many of his readers noticed.

Wundt continued to refer to his Law of Relativity and to "creative synthesis," and he still viewed mind as activity rather than substance, in the technically philosophical sense. But he came to avoid reference to the unconscious, and he restricted psychological experimentation to conscious--sometimes he says "volitional"--processes. "Unconscious inference" essentially disappeared from the Wundtian vocabulary, and another term, "apperception," took its place.

Robert Richards has suggested parallels between contemporary biological thought and the "evolution" of Wundt's program for psychological research.¹³³ In the Beiträge and Vorlesungen of the

¹³³He contends that Wundt was "among the first, perhaps the first German scientist to integrate Darwin's ideas into his own system, and throughout his career he continued to relate his changing views to what he understood as the Darwinian position." Robert J. Richards, "Wundt's early theories of unconscious inference and cognitive evolution in their relation to Darwinian biopsychology," in Wundt studies, a centennial collection, ed.

early 1860s, Wundt was comfortable with the idea of development of the conscious out of the unconscious mental actions. Like others impressed by Darwin's evidence for a grand evolutionary scheme, he overlooked the very anti-Lamarckian natural selection in the early editions of Origin of species, and preferred as explanation purposeful development to chance selection.

As Darwin's real message emerged, many biologists began to qualify their support for Darwinian evolution. Likewise, Wundt argued that neo-Lamarckian inheritance of acquired characteristics was particularly important in higher animals, especially with regard to mental functions. He stressed psychological research on conscious actions and avoided the implication that a mental mechanism analogous to natural selection could build conscious ideas out of unconscious ones. Indeed, Wundt began to argue that unconscious actions typically result from habit, or from conditioning to actions that were originally conscious. In Wundt's scheme of evolution, even the single cell at the beginning had a sort of consciousness, or voluntary action.

Wundt thus shifted from the early, Heidelberg program for a combined introspective, experimental, historical, and statistical investigation of unconscious mental phenomena to the Leipzig program of introspective and experimental investigations of simple conscious mental actions on the one hand, and historical-cultural Völkerpsychologie on the other hand. Carl

Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: C. J. Hogrefe, 1980), 42-70; 43.

Friedrich Graumann has suggested that this separation was unfortunate because it has led to the splintering of psychology as a field.¹³⁴ The concentration on experimentation was a natural one, given the scientific spirit of the time. The specialization in the direction of experimentation corresponds to William Coleman's overview of the life sciences of the nineteenth century as undergoing a shift from the "historical ideal" to the "experimental ideal" as the century wore on.¹³⁵ Wundt did not abandon the historical and sociological approaches, but he did distinguish them from experimental psychology. The result, in that climate of thought, was the flourishing of the experimental approach.

There is perhaps one other explanation why Wundt abandoned the language of the unconscious--it had become too current (Wundt would use the term "vulgar") in popular philosophy. Certainly the Schopenhauer revival brought with it talk of will and consciousness. One popular author in particular opportunistically connected Wundt's concept to his own theory of the unconscious. The retired Prussian army officer and

¹³⁴Carl F. Graumann, "Experiment, statistics, history: Wundt's first program of psychology," in Wundt studies, a centennial collection, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: C. J. Hogrefe, 1980), 33-41; 40. The German version of the article: "Wundt vor Leipzig--Entwürfe einer Psychologie," in Wolfram Meischner and Anneros Metge, eds., Wilhelm Wundt--progressives Erbe, Wissenschaftsentwicklung und Gegenwart (Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig, 1980), 63-77.

¹³⁵William Coleman, Biology in the nineteenth century: Problems of form, function, and transformation (Cambridge: Cambridge U. Press, 1977), 160-166.

inveterate scribbler of philosophical books and tracts, Eduard von Hartmann (1842-1906), published his Philosophy of the unconscious in 1869, and included relevant passages from Wundt's Beiträge on unconscious inference as support for his views.¹³⁶

Hartmann's pessimistic vision of unconscious forces driving the universe, however, was not at all congenial to a positive thinker like Wundt.

Developments in biological thought and popular German philosophy made theories of unconscious processes problematic, and Wundt began to find experiments that could study consciousness directly. The notion of synthesizing one idea out of information from more than one sense led Wundt to consider a problem that had troubled astronomers for decades--the so-called personal equation. As a celestial object approached a certain position in the sky, astronomers watched and counted pendulum beats to get the precise time of the event. They found that there were unavoidable and curiously regular differences between the results from different observers using this technique, often more than a half-second. In 1861, Wundt suggested that the differences depended upon whether a person saw first and then heard, or vice versa.¹³⁷ Consciousness, he maintained against Herbart, could only hold a single thought at any one time.

Wundt's explanation of the astronomers' problem was not the final word, but it started him investigating the time factor in

¹³⁶Eduard von Hartmann, Philosophie des Unbewussten (Berlin: Duncker, 1869).

¹³⁷See Diamond, who covers these developments in detail.

perception. With a pendulum set-up, Wundt devised a "complication experiment" which, unlike celestial events, could give absolute rather than relative measures of eye-ear coordinated estimations. These "speed of thought" experiments and Wundt's concept of apperception--the focussing of consciousness--led to a whole line of experimental investigations, discussed in Chapter Four.

E. Career advancement: Heidelberg, Zürich, Leipzig, 1871-75.

1. Farewell to physiology: the Grundzüge der physiologischen Psychologie

Wundt's professional objectives in the early 1870s were based upon his interrelated efforts to produce the text on physiological psychology and to become professor of philosophy in a German university. Although the move to philosophy would not be easy, Wundt had made the decision to leave physiology. About the time Helmholtz left Heidelberg to become a physicist at Berlin in 1871 (the founding year of the Prussian-German Reich), Wundt was given a salary, and the obligation to teach "anthropology" and "medical psychology," in the medical faculty.

In 1873 Wundt published the introduction and parts one and two of his Grundzüge der physiologischen Psychologie. These sections comprised the anatomical and physiological introduction to the brain and nervous system. In the spring of 1874, Wundt published parts three, four and five, and the work sold as one

volume in this first edition. The last three parts dealt with psychological questions. As Bringmann notes, they constituted "the first comprehensive textbook or handbook of experimental psychology by modern standards."¹³⁸

Wundt depended on the publication of Grundzüge to help him win a professorship. He had already been recommended for chairs in philosophy at Marburg, Giessen, Würzburg, Halle and Vienna, but he never received job offers.¹³⁹ Helmholtz had written letters recommending Wundt for some of these positions, but those letters also took the opportunity to criticize the current state of philosophy in Germany. Helmholtz wrote, for example, to Marburg University:

In my view the only way to produce positive content again in philosophy (which in Germany presently has sublimated into history of philosophy) is to research the actual processes of our knowledge [Erkennens] from their beginnings in sense impressions onward.

[Positiver Gehalt ist meines Erachtens für die Philosophie (die sich z. Zt. in Deutschland in Geschichte der Philosophie verflüchtigt hat) nur durch Untersuchung der tatsächlichen Wege unseres Erkennens von seinen Anfängen in den Sinnesempfindungen an wieder

¹³⁸Bringmann et al, 29.

¹³⁹Bringmann et al, 28.

zu gewinnen.]¹⁴⁰

Helmholtz's letters may have done Wundt's career more harm than good, since German philosophers may not have taken kindly to such criticism, even from such a renowned scientist.

Wundt's biggest problem was his lack of identity as a philosopher. He had been teaching physiology and psychology as part of the medical faculty at Heidelberg, but he taught no systematic philosophy, such as logic, ethics, or metaphysics. Even Grundzüge evinced a limited knowledge of philosophy. The first edition, in fact, included only a very short theoretical discussion at the end, although subsequent editions expanded that philosophical section.

2. Philosophy professor at Zürich.

Wundt did not get a call to Marburg, but his political acquaintance Friedrich Albert Lange did, and Lange's move in 1872 created a vacancy at Zürich. In Marburg Lange began a distinguished line of Neo-Kantian philosophers, including Hermann Cohen (1842-1918), Paul Natorp (1854-1924), and, carrying the same concern with epistemology beyond Marburg to Hamburg, Sweden, and the United States, Ernst Cassirer (1874-1945).

Lange lobbied to have Wundt succeed him in Zürich, but the recommendation to hire the physiologist as full professor of

¹⁴⁰Helmholtz to [University of Marburg], 1873, quoted in Schlotte, 337.

"inductive philosophy" met opposition, and the chair remained unoccupied for several semesters. Eventually the democratic faction in the ministry managed to act on Lange's recommendation in 1874; the letter offering Wundt the position apologized for the small salary but added that "it is a distinct advantage to live in a republic" [dass es ein besonderer Vorzug sei, in einer Republik zu leben].¹⁴¹ Perhaps Wundt's political work had not all been in vain.

In those days Zürich University was very small. It had only ten classrooms in an old building and no library of its own. Wundt nevertheless managed to get a small room to store the experimental instruments he used for his psychology course. In winter-semester 1874-75, Wundt gave his psychology lectures, complete with demonstration experiments, and also the course, "Philosophical results of scientific research: cosmology." As a new philosopher and a full professor, Wundt had many courses to prepare. Both lecture courses for the summer-semester 1875 were entirely new: "Logic and scientific methodology, with special reference to the methods of scientific research" [Logik und wissenschaftliche Methodologie, mit besonderen Rücksicht auf die Methoden der Naturforschung] and Völkerpsychologie. Although Wundt had taught general courses in "anthropology" at Heidelberg, he used this second lecture course to begin more specialized work on psychology of language. The publications on linguistics did not appear for nearly a quarter-century, but the work on logic

¹⁴¹Wundt, Erlebtes und Erkanntes, 242.

contributed to Wundt's first large book on this traditional subject in philosophy, which was published a few years later in 1880.

3. The call to Leipzig.

a. The scientist behind it.

Wundt had barely settled down in Zürich when he received inquiries from Leipzig. These puzzled him because he thought he had no connections there. He did know the dean of the Philosophical Faculty, who that year happened to be Friedrich Zarncke (1825-1891), editor of LiterarischesZentralblatt für Deutschland. Wundt had been writing for Zarncke's magazine since 1871, contributing over seventy short reviews of physiological literature by 1875.¹⁴²

Zarncke, a specialist in modern languages, was clearly interested in hiring a philosopher with scientific background, but it was the astrophysicist Friedrich Zöllner (1834-1882) who was Wundt's most enthusiastic supporter. Zöllner was impressed by Wundt's program for a scientific psychology; he had been saying similar things in connection with his own work in the new field of astrophysics, and more particularly in connection with the problem of a geometrical-optical illusion that bore his name.

The son of a cotton textile printer in Berlin, Zöllner's

¹⁴²Eleonore Wundt, Wilhelm Wundts Werk, 7-11.

interest had been struck by one of the cloth patterns, and he pondered an explanation for the illusion it exhibited (see Figure 2.2). He was convinced that the cause of the illusion was "purely psychic." Perception takes a certain amount of time, he theorized in 1860, and it takes less time to perceive divergence and convergence than to be assured of parallelism. Any decision whether or not the lines are parallel is "not an immediate result of sensory perception, but of logical inferences, which, with the aid of the reflecting and comparing activity of our understanding, we derive from the observational data given by the eye." In a footnote, Zöllner added that such a process is characteristic of the activity of science: we gather data, but these data are ordered by "psychic activities" consisting of "logical inferences."¹⁴³

Zöllner had good reason to be concerned about how the senses gather scientific information. Building on the discovery of the laws of spectroscopy by Bunsen and Kirchhoff in Heidelberg in 1859-60, he was a pioneer in astrophysics and celestial spectroscopy. His new spectroscopic instruments promised to reveal the chemistry and physics of distant heavenly bodies, a startling notion to some people at the time. The sensationalist notion of "clear evidence from the senses" was shattered, and, in Zöllner at any rate, a naturphilosophisch interest in mind and its relationship the physical world reemerged after a generation

¹⁴³J.C.F. Zöllner, "Ueber eine neue Art von Pseudoskopie und ihre Beziehung zu den von Plateau und Oppel beschriebenen Bewegungsphänomenen," Poggendorf's Annalen der Physik, 110 (1860), 500-523.

of physical scientists had rejected such bold analogies.

Zöllner's important book on comets, published in 1871, included a discussion of his geometrical-optical illusion and a hodgepodge of other topics. He declared that the time was ripe for the "founding and development of an experimental psychology." He credited his Leipzig colleagues, E.H. Weber and Gustav Fechner, with the formulation of a "psychophysical statics," but pointed out the need for a "psychophysical dynamics" based on experimental investigations. Advances in physical science, Zöllner declared, depended upon advancement of experimental psychology.¹⁴⁴

Zöllner favored Wundt's explanations for perceptual processes to those of Helmholtz or Hering. Helmholtz took a sober empiricist approach, but Zöllner liked to think in terms of bold discoveries, not patient investigations. Hering argued that certain innate ideas were part and parcel of the physiological system. For example, he gave the following explanation for Zöllner's illusion: we cannot perceive the vertical lines as parallel, because we overestimate small angles and underestimate large ones. We do this because the retinal surface is curved and apparent length of a line segment is given by the chord, rather than the arc, on the retina. Typically, Hering starts with a perceptual phenomenon (the illusion of divergence and convergence), then proposes a bold physiological explanation

¹⁴⁴J.C.F. Zöllner, Ueber die Natur der Cometen. Beiträge zur Geschichte und Theorie der Erkenntnis, 3rd ed. (Leipzig: Engelmann, 1883), 224-225. The preface states that this particular chapter is identical in the first edition, 1871.

(the retina is "wired" to the brain in such a way that chord-length rather than arc-length is perceived). An arch-physiologist, Hering rejected the separation of perceptual problems into physiological and psychological parts.¹⁴⁵ His keen observations led him to some remarkably accurate guesses about many things, such as certain aspects of color vision. However, Helmholtz showed that Hering's explanation of Zöllner's illusion was flawed. To this day, there is still no consensus on this particular visual phenomenon.

Wundt had begun, already in 1858, with the first articles of his Beiträge, to set forth systematically psychological explanations for such phenomena in sensory perception. The fifth article (1862) dealt with optical illusions and emphasized psychic controls of perceptual processes. In the first edition of his Grundzüge (1874), Wundt reproduced Zöllner's figure and commended Zöllner's general approach to the problem. His explanation differed from that of the astrophysicist, however: Wundt believed that certain preferred eye movements were responsible for the illusion that the vertical lines were not parallel.¹⁴⁶

A few years after he arrived in Leipzig, Wundt disappointed Zöllner severely, by failing to be as enthusiastic about visiting spiritualists and their seances, as Zöllner himself was.¹⁴⁷ At

¹⁴⁵Ewald Hering, Beiträge zur Physiologie (Leipzig: Engelmann, 1861-64), 75.

¹⁴⁶Wundt, Grundzüge der physiologischen Psychologie (Leipzig: Engelmann, 1874), 563-566.

¹⁴⁷Marilyn E. Marshall and Russel A. Wendt, "Wilhelm Wundt,

that time, Zöllner called attention to Wundt's debt to him:

My highly esteemed colleague, you know of course that you owe your presence in Leipzig to me, since it was I who removed the various doubts about your call from Zürich to our university.

Zöllner explained that he had endorsed Wundt because Wundt had been Helmholtz's assistant, had worked in physiological optics (as had Zöllner), and was well educated in the natural sciences.

I believed that I possessed sufficient evidence from your writings on sensory perception and the axioms of modern physics that you would not succumb to the errors of the so-called philosophers.¹⁴⁸

The protocol of the faculty committee which nominated Wundt shows that Zöllner indeed was Wundt's strong supporter.

b. Philosophy at Leipzig, how Wundt fit in.

Zarncke, as dean, kept the minutes of the meeting of 5 February 1875.¹⁴⁹ The report noted that Leipzig University

Spiritism, and the assumptions of science," in Wundt studies, a centennial collection, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 158-175.

¹⁴⁸Zöllner (1881), translated in Bringmann, et al, 129.

¹⁴⁹Werner Thiermann, "Zur Geschichte des Leipziger

educated thousands of students who would benefit from lectures on the relationship between the material and the mental realms. A philosopher with a background in the knowledge and methodology of natural science was needed in order to avoid dilettantish coverage of this important topic. Wundt was the best candidate: he was a trained physiologist; he had earlier been "leader" of a physiological laboratory (it is not specified whether this refers to Helmholtz's institute or Wundt's private laboratory in Heidelberg); and he had attracted the attention of philosophers with his Grundzüge.

In his response to these statements, the lone Ordinarius in philosophy, Moritz Wilhelm Drobisch, added that Wundt's book on physical axioms should also be mentioned, since it was a well-balanced study [viel Ausgewogenheit enthalten], but that the Vorlesungen über die Menschen- und Thierseele should not be mentioned in the nomination, for though the book contained promising material, it was too superficial.

Drobisch had some doubts about what kind of influence Wundt would come to have. He had hoped that the medical students would be able to benefit from a new professor who, like Hermann Lotze of Göttingen, made it clear that "the whole person was not simply a machine driven by physical and chemical forces" [dass der ganze Mensch nicht bloss eine von physikalischen und chemischen Kräften getriebene Maschine ist]. He was not sure where Wundt stood on

psychologischen Instituts--Wilhelm Wundt und seine Berufung an die Leipziger Universität," Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschafts- und Sprachwissenschaftliche Reihe, 29 (1980), 129-136; 133-135.

that issue. Drobisch, rankled by aspersions on the state of philosophy in Leipzig, added that he had always linked epistemology and natural science in his lectures. In his memoirs Wundt shows sympathy with this claim: although they were followers of Herbart in psychology and general philosophy, Drobisch and his colleague, Honorarprofessor Ludwig Strümpell, had always "maintained a friendly relationship between philosophy and the positive sciences" [die Tradition eines befreundeten Verhältnisses der Philosophie und der positiven Wissenschaften aufrecht erhielt].¹⁵⁰ In response to Drobisch's doubts about Wundt, Zöllner again energetically pleaded that Wundt be offered the professorship of philosophy.¹⁵¹

Zarncke wrote to Wundt on 24 April informing him that the faculty had passed the nomination to the educational ministry. His letter explained that the salary was relatively low for Leipzig, only 1500 Talers, but that 600 more were likely to come from lecture and examination fees. Zarncke summarized the faculty's wishes for "a scholar who has modern scientific [wissenschaftlich] psychology as his life's work" and noted that Wundt was the one and only choice for the job.

Two days later Wundt accepted the offer. He presumed that his moving expenses would be reimbursed, and he requested space for the "large illustrations and equipment" that he used in his psychology lectures. In early May, Wundt informed Zarncke that

¹⁵⁰Wundt, Erlebtes und Erkanntes, 295-296.

¹⁵¹Thiermann, op. cit., 134.

the formalities were settled with the ministry official in charge of them in Dresden, Kultusminister von Gerber: "I hail this decision of the Leipzig faculty not only in my own interest but regard it as a welcome omen for the whole direction of philosophy which I represent."¹⁵² Zarncke concurred in his enthusiasm: "I hope that your call to our university here in the heart of German youth will one day be viewed as the beginning of an epoch in the history of German philosophy. One can no longer satisfy German young people with the old humdrum ways" [dem hergebrachten Schlendrian].¹⁵³ Zarncke was probably referring here to Herbartian philosophy as taught by Drobisch and Strümpell.

Understandably, Wundt was careful not to cross his senior colleague in philosophy at Leipzig. He checked the schedule of lectures with Zarncke before submitting his own titles for the catalogue. Since Drobisch customarily taught psychology in the winter-semester and logic in the summer-semester, Wundt started off with logic in the winter and psychology in the summer.¹⁵⁴

The interactions concerning lecture schedules were much more casual with the other new professor of philosophy. The faculty actually called two professors of philosophy simultaneously, culminating nearly ten years of controversy on what to do about a vacant chair. Although philosophy courses might be given by other professors--Zöllner, for example, often did

¹⁵²Wundt to Friedrich Zarncke, 6 May 1875, translated in Bringmann et al, 128.

¹⁵³Schlotte, 338.

¹⁵⁴Thiermann, op. cit., 136.

this--professors of philosophy were an absolute necessity for state teachers' examinations. Leipzig's steeply growing enrollment aggravated this need. In the Philosophical Faculty alone, enrollment grew from an average of 226 in the years 1861-66, to 464 for 1866-71, to 1011 for 1871-76, to an average of 1272 in 1876-81--a five-fold increase over fifteen years.¹⁵⁵ So the decision was made to hire both Max Heinze (1835-1909), who had earlier taught in Leipzig, and the unknown factor, Wundt.

Heinze represented the philological and historical aspects of philosophy, while Wundt was to concentrate on philosophy's relationship to the natural sciences. Heinze had written on history of ancient philosophy and aesthetics, and his best-known contribution to scholarship would be his edition of the authoritative Geschichte der Philosophie, a project begun by Ueberweg.

Heinze pleased and surprised Wundt by suggesting that they not divide teaching duties according to the areas specified in their Berufung. Thus Heinze often lectured on psychology, and Wundt gave lectures on history of philosophy as early as his third semester in Leipzig. Wundt had to work hard to prepare his courses, since he had no formal training in philosophy. His reviews for Zarncke's Zentralblatt began immediately to cover more philosophical works than physiological works. As Bringmann

¹⁵⁵J. Conrad, "Allgemeine Statistik der deutschen Universitäten," in Die Deutschen Universitäten (für die Universitätsausstellung in Chicago 1893, unter Mitwirkung zahlreicher Universitätslehrer), ed. W. Lexis, vol. 1 (Berlin: A. Asher, 1893), 115-168; 120, Table I.

and Ungerer have suggested, the hiatus in Wundt's active publication record in his first years at Leipzig can be attributed to his intensive reading and research in philosophy.¹⁵⁶ Still, it must have encouraged Wundt--and probably flattered him also--that a traditional philosopher such as Heinze readily accepted him as a full-fledged colleague.

¹⁵⁶Wolfgang G. Bringmann and Gustav A. Ungerer, "The foundation of the Institute for Experimental Psychology," Psychological research, 42 (1980), 5-18; 12.