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**Wilhelm Wundt and the establishment of experimental
psychology, 1875–1914: The context of a new field of scientific
research**

Robinson, David Kent, Ph.D.

University of California, Berkeley, 1987

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Wilhelm Wundt and the Establishment of Experimental Psychology,
1875-1914: The Context of a New Field of Scientific Research

By

David Kent Robinson

A.B. (Harvard University) 1976

M.A. (University of California) 1980

DISSERTATION

Submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

HISTORY

in the

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OF THE

UNIVERSITY OF CALIFORNIA, BERKELEY

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DOCTORAL DEGREE CONFERRED
MAY 15, 1987
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**Wilhelm Wundt and the Establishment of Experimental Psychology,
1875-1914: The Context of a New Field of Scientific Research**

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Wilhelm Wundt and the Establishment of Experimental Psychology, 1875-1914:

The Context of a New Field of Scientific Research

David Kent Robinson

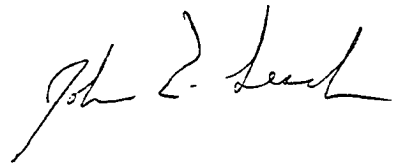
Abstract

Wilhelm Wundt (1832-1920), often called the father of modern psychology, brought his background in experimental physiology to bear on questions of philosophical psychology, with the intention to make psychology scientific. Following his medical education and physiological research in Heidelberg, he launched a program for psychology in the 1870s, by taking advantage of unique opportunities which allowed him to become professor of philosophy in Leipzig in 1875. There Wundt established, in 1879, the Institute for Experimental Psychology, and directed laboratory work related to his general theories of mental processes. The reaction-time experiment, in particular, became a vehicle that spread the new psychology throughout the world.

Psychology was part of philosophy at the time, and Wundt's achievement must be understood in the context of his intellectual and institutional environment, i.e., the requirements of him as academic philosopher and the attitudes of other philosophers, scientists, students, and university administrators toward the idea of an experimental science of mind. Wundt's program was very successful in attracting followers, especially in the 1880s, when there was strong belief that experimental science would continuously open up new areas of research. Wundt's psychological model combined a concept of active mind, a heritage of German idealism, with the promise of experimental science. In the 1890s, however, the philosophy of positivism, for example that of Mach, attracted younger psychologists away from Wundt and general theories.

Some historians have qualified Wundt's achievement, observing that psychology did not achieve separate identity as a discipline in Germany, as it did in America. Wundt, however, successfully promoted experimental psychology as the scientific basis of philosophy and thus as an integral part of the field. Experimentalists attained increasingly more professorships of philosophy, though by World War I, signs were that the arrangement was strained. Wundt's career illustrates a changing context for experimental psychology, from an optimistic to a critical view of broad scientific theories. Even though

Wundt's own theories became less popular, experimental psychology had been established.

A handwritten signature in cursive script, appearing to read "John E. Smith". The signature is written in black ink on a white background.

Acknowledgments

One of the best things about endings is that they give pause to reflect; I gladly reflect now upon those who mean so much to me.

My dissertation committee has been trusting, helpful, and long-suffering. To my advisor, John E. Lesch, my thanks for his patience, for his continual encouragement and, of course, for reading and commenting on the many sets of drafts. To Roger Hahn, thanks for uplifting discussions, intellectual generosity, and well-placed words of advice. To these two, and to all who staff the History Department, I owe my training in this profession. I also am obliged to the Department for my computing account. The third member of my committee, Gerald Westheimer, is truly an inspiration. His knowledge of, and excitement for, science, philosophy, and nineteenth-century German thought made my visits with him pure joy.

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Most of the research for this dissertation was carried out in the University Archive in Leipzig. Archivist Gerhild Schwendler, as well as Karin Gaukel and Petra Müller, provided me with an exceedingly cheery and productive environment. I learned much there, especially from my teacher, Archivist Emeritus Renate Drucker, to whom I dedicated this work.

With support from the University of California Regents Fellowship, I continued my research in 1984 at the Institut für die Geschichte der Neueren Psychologie in Passau, FRG, where Director Werner Traxel, Gisela Tyroller, Horst Gundlach, Ulrich Zschuppe, Angelika Wacker and all the staff helped me immensely, as did Passau University. In Passau, and elsewhere, I have profited from the friendship of Wolfgang Bringmann, and I look forward to our future collaboration. The annual meetings of CHEIRON (The International Society for the History of Behavioral and Social Sciences) gave me the opportunity for my scholarly debut. Its members' names crowd my footnotes, and I thank them all.

Finally, I want to thank my family in Indiana. In spite of my crazy ideas, they continue to believe in me, and to them I dedicate my next effort.

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Commonly used abbreviations and short titles.

UAL	University Archive, Leipzig (Archive of Karl Marx University)
KM	Königliches Ministerium des Kultes und öffentlichen Unterrichts (the ministry of education for Saxony)
NS	New Series, as in a journal
Boring	refers to Edwin G. Boring, <i>A history of experimental psychology</i> . 2nd ed. (NY: Appleton-Century-Crofts, 1950).

A note on quoted material: All translations from the German into English are my own, unless otherwise noted. Most longer passages, and many key phrases, are given in both German and English. Hopefully few will find this parallel text distracting, and some will find it enjoyable.

To Renate Drucker, teacher, scholar, citizen.

Chapter I

The birth of scientific psychology.

A. Introduction.

This study examines and analyzes the emergence of the field of experimental psychology in the last decades of the nineteenth century and the early years of this century. The focus on the scientific career of Wilhelm Wundt (1832-1920), generally acknowledged as the founding father of modern psychology, supports the view of the traditional "great man" approach to the history of science--that the ideas and achievements of a single individual can disproportionately influence the early stages in the formation of a discipline. At the same time, a general intellectual development depends upon more than a single thinker, innovator, and academic entrepreneur; it also depends upon the context of that person's career: his training, the institutional and intellectual environments within which he conceived and promoted the new line of research, his students and followers, his opponents and detractors. The circumstances that engendered a scientific study of mental life were complex, and a combination of biography and institutional and intellectual history is needed to cast light on the problematic nature of the emergence of modern psychology.

Is psychology a science? This has been an agitated question among psychologists and historians.

The conventional view is that scientific (or experimental) psychology began in the late nineteenth century when a few researchers, particularly Wundt, began applying the findings and methods of sensory physiology explicitly to an investigation of mental phenomena. These psychologists announced the birth of the new science, established its research program, and nurtured the early development of the academic and professional field of psychology.

Edwin G. Boring's monumental book, *A history of experimental psychology*,¹ sets forth such a view of the origins of psychology. The prominent Harvard psychologist recounted a wide range of writings and discoveries that made psychology experimental. Although not all contributors to this process

¹ Edwin G. Boring, *A history of experimental psychology*. 2nd ed. (NY: Appleton-Century-Crofts, 1950). First edition, 1929. Hereafter Boring.

were experimenters, they together laid the groundwork for the experimental approach that, according to Boring, made psychology an independent science.

Thomas Kuhn's theory of science and its paradigms poses challenges to Boring's description of experimental psychology. Kuhn implied that the behavioral sciences are not mature sciences,² that psychologists do not have a paradigm--a problem or set of issues that defines the locus of the cognitive content of the science by consensus of the community of researchers in that field.

In the early 1970s, Kuhn's theory of science and scientific revolution provoked a lively debate on the status of psychology.³ The forays into intricacies of Kuhnian and other theories of science were centrally concerned with whether psychology is a mature science now and whether it can look forward to paradigm shifts. From the standpoint of this dissertation, the remarkable thing about the debate was that the assessment of Wundt's contribution rose and fell with judgments of the scientific status of psychology a century later. Some argued that both nineteenth-century German psychology and late-twentieth-century American psychology are mature sciences with well-defined paradigms; others claimed that neither are. No one took the position that modern psychology is scientific but Wundtian psychology was not.

Robert I. Watson, who began the *Journal for the history of the behavioral sciences* in 1965 and a doctoral program in history of psychology at the University of New Hampshire at about the same time, found the Kuhnian model to be of little help. He claimed that since his science was pre-paradigmatic, its history required a different approach. Instead of normal science and revolutions, Watson proposed a framework of "prescriptions" or "attitudes" that define the various ways in which psychologists formulate their questions and research.⁴ These prescriptions take the form of eighteen contrasting pairs: for

² For example, Thomas S. Kuhn, *The structure of scientific revolutions*, 2nd ed. (Chicago: U. Chicago Press, 1970), preface, vii-viii. The preface is identical in the first edition, 1962.

³ David S. Palermo, "Is a scientific revolution taking place in psychology?" *Science studies*, 1 (1971), 135-155; Niel Warren, "Is a scientific revolution taking place in psychology?--Doubts and reservations," *ibid.*, 1 (1971), 407-413; L.B. Briskmann, "Is a Kuhnian analysis applicable to psychology?" *ibid.*, 2 (1972), 87-97; Brian D. MacKenzie, "Behaviorism and positivism," *Journal for the history of the behavioral sciences*, 8 (1972), 222-231; Walter B. Weimer and David S. Palermo, "Paradigms and normal science in psychology," *Science studies*, 3 (1973), 211-244; Niel Warren, "Normal science and the normal standards of scholarly debate," *ibid.*, 4 (1974), 195-197; Walter B. Weimer and David S. Palermo, "Standards, scholarship, and debate: A rejoinder to Warren," *ibid.*, 4 (1974), 198-200; Walter B. Weimer, "The history of psychology and its retrieval from historiography. I: The problematic nature of history," *ibid.*, 4 (1974), 235-258; Walter B. Weimer, "The history of psychology and its retrieval from historiography. II: Some lessons for the methodology of scientific research," *ibid.*, 4 (1974), 367-396; Mark W. Lipsey, "Psychology: Paradigmatic, postparadigmatic, or misparadigmatic?" *ibid.*, 4 (1974), 406-410.

⁴ Robert I. Watson, "Psychology: A prescriptive science," *American psychologist*, 22 (1967), 435-443.

example, Conscious mentalism--Unconscious mentalism, Staticism--Dynamicism. Watson admitted that he was less interested in defining psychology as a unique academic field than in giving an overview of the types of problems psychologists deal with.⁵ The prescriptive pairs define prominent and recurrent issues in psychological thought and may give some understanding of its development. The overview they provide might, in rare cases, even help psychologists mine the past for fresh approaches to present research.⁶ They might also provide a suitable framework for a comprehensive survey of psychological ideas over time.⁷ Still, the prescriptive pairs as a whole are ahistorical, intellectual concepts which are at best tools to reaching a more general view of psychology's history.

Since the goal here is to understand Wundt's role in the establishment of experimental psychology, the question of scientific discipline brings back Kuhn's model and the historical issues it raises. Whether paradigm-based science actually emerged in Wundt's laboratory depends on interpretation of Kuhn's theory of science. One could say that, in a strict sense, only natural sciences can be mature sciences with well-defined paradigms that guide the progress of normal research between revolutions. Behavioral or social sciences, because they study ultimately inscrutable human action, cannot develop clear paradigms which exclude alternative points of view sufficiently to define normal science. A less strict interpretation of Kuhn's theory might relax the requirement that consensus exclude all controversy over fundamentals. In the case of psychology, such consensus may be an impossibility; schools of thought among its researchers are more typical. This less strict approach applies the sociological aspects of Kuhn's theory more than its conceptual aspects. In the postscript to the second edition of *Structure of scientific revolutions*, Kuhn himself pointed in this direction and described a scientific paradigm as a "disciplinary matrix" uniting a community of practitioners.⁸

Using the latter sense of scientific discipline and postponing the question of whether psychology is a mature science, this study examines both the institutional and intellectual history of early experimental

⁵ Robert I. Watson, "Prescriptions as operative in the history of psychology," *Journal for the history of the behavioral sciences*, 7 (1971), 311-322.

⁶ A case for direct relevance of a long forgotten Wundtian theory to current research in psychology is given by Thomas H. Leahey, "Something old, something new: Attention in Wundt and modern cognitive psychology," *Journal of the history of the behavioral sciences*, 15 (1979), 242-252.

⁷ Such a work, though not directly based on Watson's prescriptions, is Daniel N. Robinson, *An intellectual history of psychology* 2nd ed. (NY: Macmillan, 1981). (No relation to the author of this dissertation.)

⁸ Kuhn, *op. cit.*, 182.

psychology. It tries to determine what the founders of experimental psychology understood a science of psychology to be, and to what extent they were able to meet their own expectations for the field. If it succeeds in pointing out definite internal and external conditions that affected the successes and failures of the founders' plans, then this study has contributed to the understanding of history of psychology, and perhaps also to the understanding of general issues surrounding other human sciences in the twentieth century.

Of the difficulties associated with this task, the question of scientific status has already been mentioned. This problem should not be paralyzing; it is in fact part of the story. The deliberate intention to make psychology scientific informed the development of experimental psychology in the nineteenth century. A second problem is psychology's close relationship to philosophy. The classical view, that the Scientific Revolution freed science from the dogmatism of philosophy (especially its theological aspects) in the seventeenth and eighteenth centuries, seems to conflict with the fact that scientific psychology was part of nineteenth-century academic philosophy in Germany, where its practitioners generally supported a continuation of the combination. This brings up the third problem--that psychology was not a separate academic discipline in nineteenth-century Germany, even though German psychologists then led the world in the theoretical, technical and methodological development of the field.

Modern scholarship on the Scientific Revolution has found that the distinction between science and philosophy at the time was not so sharp as some of the rhetoric of science would indicate. In the nineteenth century, the interaction of scientific and philosophical thought is the most important feature of the emergence of experimental psychology.

B. The background of experimental psychology in sensory physiology, psychophysics, and philosophy.

1. Sensory physiology.

One important scientific discovery was that specific nerves have specific functions. In England around 1810, Charles Bell (1774-1842) sectioned spinal nerves in living animals and commented on the different functions of posterior and anterior roots. In France in 1822, François Magendie (1783-1855)

used his superior surgical technique to determine conclusively that the anterior roots of the spinal cord are motor nerves and the posterior roots are sensory nerves. The so-called Bell-Magendie Law was an early success of the emerging field of experimental physiology.⁹

In Germany Johannes Müller (1801-1858) further developed the specificity of nerves. A given sensory nerve, he wrote in 1838, has a "specific energy." If stimulated to the appropriate degree by any of a variety of physical or chemical agents, the nerve reports the same type of sensation to the central nervous system, or sensorium. For example, pressure on the side of the eyeball can produce sensations of luminous flashes; electrical stimulation of the tongue can produce tastes; and certain substances in the bloodstream can make a person hear sounds. In other words, the sensory system's information about the physical world is not entirely trustworthy:

Sensation consists in the sensorium's receiving through the medium of the senses, and as a result of the action of an external cause, a knowledge of certain qualities or conditions, not of external bodies, but of the nerves of sense themselves; and these qualities of the nerves of sense are in all different, the nerves of each sense having its own peculiar quality or energy.¹⁰

A natural extension of the specificity of nerves was the localization of distinct sensory areas in the brain, a concept that was especially important to phrenologists. The complex anatomy and physiology of the brain, however, and perhaps also the disrepute of phrenology among scientists, allowed for very little interaction between work on cerebral localization and work in psychology, at least until the twentieth century.¹¹ Experimental techniques useful to psychology developed instead out of investigations of the functions of peripheral sensory organs.

A variety of experimental scientists, not only physiologists, were concerned about how the senses impart knowledge of physical phenomena. The French physicist and mathematician Pierre Bouguer (1698-1758), a pioneer in photometry, determined that the human eye could distinguish an increase of about 1/64 in illumination, whether the illumination level was high or low. In other words, the

⁹ John E. Lesch, *Science and medicine in France: The emergence of experimental physiology, 1790-1855* (Cambridge, MA: Harvard U. Press, 1984), 175-178.

¹⁰ Johannes Müller (1838), translated in *A source book in the history of psychology*, ed. Richard J. Herrnstein and Edwin G. Boring (Cambridge, MA: Harvard U. Press, 1965), 31.

¹¹ Boring, 50-95. Cf. Robert M. Young, *Mind, brain, and adaptation in the nineteenth century: Cerebral localization and its biological contexts from Gall to Ferrier* (Oxford: Oxford U. Press, 1970).

differential threshold for vision was a relative rather than an absolute measure of stimulus.¹² The Lille physicist Charles Delezenne (1776-1866) produced a study in 1827 which implied that the differential threshold for musical pitch is also relative.¹³ In 1834 the Leipzig anatomist, Ernst Heinrich Weber (1795-1878), published a Latin treatise which discovered experiments on judging weights by lifting and estimating line lengths by eye. Taking Delezenne's findings into consideration, Weber noticed a general pattern:

Since the observation has been confirmed in most of the senses that men, in observing disparity, perceive not absolute but relative differences between things, I have urged myself again and again to investigate the cause of this phenomenon, and I hope that this cause will sometime be known well enough so that we will be able to judge more correctly concerning the nature of the senses.¹⁴

E.H. Weber generalized that, for a given sensory task, the measurements of these two stimuli. His idea, "just-noticeable difference" between two stimuli describes a characteristic, constant proportion between the physical became widely known after it appeared in 1846 in an important reference work, Rudolph Wagner's *Handwörterbuch der Physiologie*.¹⁵

The notions of specificity of nerves and just-noticeable differences were involved in much nineteenth-century research in sensory physiology. E.H. Weber produced a classic study of cutaneous sensitivity in 1852.¹⁶ The skin, he suggested, was divided into "sensory circles," each with one associated nerve fiber. Two simultaneous stimuli could be distinguished, only if they stimulated different circles which had at least one unstimulated circle between them; otherwise the two were perceived as one. Weber used compass points to test different areas of his own body. He found substantial variance in minimum distances at which he could perceive two points. The tips of the tongue and fingers could distinguish points only about 2 mm distant, whereas parts of the thigh and upper arm could not distinguish compass points that were 20 mm apart. Weber's system accounted for the observed phenomena in a very straightforward way, in that he assumed that specific cutaneous nerves give direct reports about

¹² Pierre Bouguer (1760), translated in Herrnstein and Boring, eds., *op. cit.*, 60-62.

¹³ Charles Delezenne (1827), translated in Herrnstein and Boring, eds., *ibid.*, 62-64.

¹⁴ Ernst Heinrich Weber (1834), translated in *ibid.*, 65.

¹⁵ Ernst Heinrich Weber, "Der Tastsinn und das Gemeingefühl," in *Handwörterbuch der Physiologie*, ed. Rudolph Wagner, vol. 3 (Braunschweig: Vieweg, 1846), 481-588.

¹⁶ Ernst Heinrich Weber, "Ueber den Raumsinn und die Empfindungskreis in der Haut und im Auge," *Berichte der königlich-sächsischen Gesellschaft der Wissenschaften zu Leipzig, mathematisch-physische Classe*, 4 (1852), 87-105.

specific areas of the skin.

E.H. Weber's work on sense of touch in the 1840s and 1850s was followed by important anatomical and physiological investigations into vision and hearing in the 1850s and 1860s. These phenomena are of course more complex. Advances in physiology of vision in particular involved studies of subjective phenomena, particularly by careful observers such as Johannes Müller and Johannes Evangelista Purkinje (1787-1869). Even though the physicalist approach of Hermann Helmholtz defined a stage of maturity for physiology of vision and hearing in the 1860s, subjective visual studies, particularly by Ewald Hering (1834-1918), continued to be important.¹⁷

Studies of visual physiology involved the psychology of perception, and often more than incidentally. Aspects of mental activity were typically discussed along with anatomical and physiological considerations. The main idea, however, was not experimental investigation of mental processes in general. It was simply necessary to know when and how mental processes affected the sensory processes being observed. Hering and others made use of subjective experiences as clues even in investigation of peripheral sense organs. There was no direct experimentation on mental functions themselves, since they were presumably not accessible to exact measurement.

2. Psychophysics.

In 1860 a colleague and former student of E.H. Weber, Gustav Theodor Fechner (1801-1887), published a book, *Elemente der Psychophysik*, which announced a new field of science, psychophysics, based on a scale of measurement for sensation, a mental phenomenon.¹⁸

Fechner was not a physiologist but rather a physicist turned philosopher. After an education in medicine, he became professor at Leipzig and was an important German physicist in the 1820s and 1830s. He introduced and translated French treatises on analytical physics and contributed significant research on the measurement of electric current. Fechner was not content, however, with sober experi-

¹⁷ On the influence of the poet and would-be scientist Goethe on studies of subjective visual phenomena, see Karl E. Rothschuh, *History of physiology*, trans. Guenter B. Risse (Huntington, NY: Robert E. Krieger, 1973), 197-200; on Hering, 299-301.

¹⁸ Gustav Theodor Fechner, *Elemente der Psychophysik*, 2 vols. (Leipzig: Breitkopf and Härtel, 1860); vol. I has been translated as *Elements of psychophysics*, trans. Helmut Adler (NY: Holt, Rinehart, and Winston, 1966).

ment. With a sense of mission that can be compared to that of *Naturphilosophen* in the first decades of the nineteenth century, Fechner took Weber's finding on just-noticeable differences in stimulation and made it the basis for a general relationship between physical and mental phenomena. More accurately, since Fechner ardently believed in the possibility of a unified understanding of the world, he sought the connection between matter and spirit. Psychophysics, based on Weber's finding, would make this connection amenable to experimental investigation, quantitative representation, and scientific understanding.¹⁹

Weber had determined that in any given sensory system, the just-noticeable difference (j.n.d.) in stimulus R (from the German *Reiz*) divided by the intensity of stimulus is a constant fraction, C :

$$dR/R = C \quad \text{for the j.n.d.}$$

Stimulus is measured as a physical quantity, e.g., illumination, electrical current, pressure, or weight.

Fechner then took a bold step: he assumed that all j.n.d.'s in a sensory system are equal, so that the j.n.d. is the unit of sensation, S : This assumption allows a further relation between change in stimulus and change in sensation.

$$dS = c dR/R \quad \text{where } c \text{ is a constant different from } C \text{ above.}$$

Fechner integrated the equation to obtain his famous Law of Psychophysics:

$$S = k \log R \quad \text{where stimulus, } R, \text{ is expressed in units of j.n.d.'s.}$$

Fechner believed that this law held for all relationships between stimulus and sensation, so that the Law of Psychophysics gave the quantitative relation between mind and matter.

Reviewing the literature on sensory physiology, Fechner set down methodological principles for determining the all-important j.n.d.'s, the natural units of sensation, the psychic part of psychophysics. His three basic methods have continued to be standard to this day.

¹⁹ On Fechner: Marilyn E. Marshall, "Physics, metaphysics, and Fechner's psychophysics," in *The problematic science: Psychology in nineteenth-century thought*, ed. William R. Woodward and Mitchell G. Ash (NY: Praeger, 1982), 65-87; Wilhelm Schreier, "Über historische Wurzeln von Fechners Psychophysik," in *Zur Geschichte der Psychologie* ed. Georg Eckardt (Berlin [GDR]: Verlag der Wissenschaften, 1979), 61-71; and Lothar Sprung and Helga Sprung, "Gustav Theodor Fechner—Wege und Abwege in der Begründung der Psychophysik," *Zeitschrift der Psychologie*, 93 (1978), 439-454.

The first was direct reporting or "the method of just-noticeable difference" which E.H. Weber used. This was the easiest method, but Fechner cautioned that it was very subjective and so should be combined with the others.

The second method was the "method of right and wrong cases." This had been developed independently by Karl Vierordt (1818-1884) in Tübingen and Alfred Wilhelm Volkmann (1800-1877), Fechner's brother-in-law and professor in Halle. In this measurement of the j.n.d., the subject is given a base stimulus and then judges whether or not subsequent stimuli match the base stimulus.

The third method, "the method of average error," was commonly used in physics and astronomy and was adapted to psychophysical experiments by Fechner and A.W. Volkmann. In this method, the subject himself varies a stimulus until it matches a base stimulus. The range of error in this matching indicates the j.n.d. The last two methods invite the statistical analysis of errors in order to arrive at estimates for sensory thresholds, the j.n.d.'s.

Fechner was aware of inconsistencies affecting the proportionality relationship between stimulus and sensation (the area he called outer psychophysics), but he asserted that the proportionality between sensation and central nervous excitation (inner psychophysics) was exact. Although Fechner's ultimate goal was to understand inner psychophysics, his outer psychophysics was more directly accessible to empirical work. Many researchers worked to identify the stimulus ranges where Fechner's Law was valid and where it failed. Important contributors to the development of psychophysics included two Belgians: the physicist J.A.F. Plateau (1801-1883) and the professor of philosophy J.R.L. Delboeuf (1831-1896). The latter criticized Fechner for making the j.n.d. the sole basis for psychophysics and developed other ways to measure sensory magnitudes or at least to compare them. In Germany, Georg Elias Müller, a rival of Wundt's, began his career by writing an important critique of Fechner's methods (see Chapter Seven).

Psychophysics was historically prior and methodologically essential to early experimental psychology. It must be strongly emphasized, however, that the two areas of research were not identical. Boring, for example, blurred the distinction. He put chapters on Fechner, Helmholtz, and Wundt in a section called "The founding of experimental psychology" and wrote of Fechner, "One may call him the

'founder' of experimental psychology, or one may assign that title to Wundt. It does not matter. Fechner had a fertile idea which grew and brought forth fruit abundantly."²⁰ Like Wundt's younger critics during his own lifetime, Boring tended to look upon the large number of psychophysical studies out of the Leipzig laboratory as Wundt's lasting contribution to scientific psychology and to consider work done on areas such as attention, volition, and emotions to be unfortunate expressions of Wundt's mentalist theories.

Psychophysics as envisioned by Fechner, however, was at once more narrow and broader than Wundt's experimental psychology. Its broad ambition was to give credence to a metaphysics, the parallelism or essential oneness of matter and spirit. Wundt and most other experimental psychologists had little interest in that effort, even if they were sympathetic to the view. They did however appreciate psychophysical techniques for measuring sensations and establishing relationships to physical stimuli. For this reason psychophysics became an important part of the repertoire of the research psychologist.

The equation of early experimental psychology with psychophysics denies the historical importance of Wundt's program for experimental psychology, in its entirety. This program, like the word "psychology," originated in philosophy.

3. Philosophy.

Psychology as an area of philosophy is at least as old as Aristotle's *De anima*, but since the focus here is on scientific psychology, it is convenient to begin the discussion with the Scientific Revolution. In the seventeenth century Descartes (1596-1650) argued that mechanical principles underlie physiology but that innate ideas provide the fundamental basis of human psychology. John Locke (1632-1704) rejected Cartesian innate ideas and put forth the view that human knowledge derives from sensations and reflections upon those sensations. It is *associations* of sensations and reflections which give rise to the concepts, categories, notions of causality, etc., which we call knowledge. This empirical epistemology was very popular with English and French philosophers of the Enlightenment, who, taking little interest in the reflections, developed the characteristic philosophy of sensationalist empiricism.

²⁰ Boring, 295.

Boring devoted several chapters to "British empiricism and associationism," because he claimed that it "formed the chief philosophical preparation for the new scientific psychology" and that Wundt "relied primarily upon the British tradition."²¹ This emphasis on British associationism, however, reflects Boring's own views more than Wundt's, which were more dependent on German idealistic philosophy.²²

Though a complete discussion of German idealism must go back to its roots in medieval Scholasticism and religious mysticism, for present purposes it will suffice to begin with Gottfried Wilhelm Leibniz (1646-1716). Leibniz proposed an elaborate metaphysical system based on atom-like "monads." The doctrine of monads accounts for the physical attributes of extension and motion, and since monads are "perceptive" their activity also accounts for mental phenomena. Different monads have different degrees of conscious, self-conscious, or even unconscious perception of themselves and the universe. Leibniz called conscious perception "apperception," and unconscious perception "petites perceptions." Stimuli could produce unconscious perceptions, e.g., sounds of separate water drops hitting the beach, which sum to produce a conscious one, e.g., the apperception of the sound of a wave rolling in. Perceptive monads supported Leibniz's notion of the pre-established harmony of the universe, a harmony that included logic and ethics, as well as celestial mechanics. Leibnizian metaphysics indicated an underlying oneness of body and mind, and of experience and rationality. Christian Wolff (1679-1754), the leader of German philosophy after Leibniz, made these two aspects explicit for psychology when he divided the topic formally into two books, *Psychologia empirica* (1732) and *Psychologia rationalis* (1734).

In Germany the double-aspect view of psychology survived the sensationalist empiricism of the Enlightenment. David Hume (1711-1776) carried British empiricism to its logical extreme, reaching the conclusion that associationist psychology was the ultimate basis of all knowledge, including natural science. In his analysis science was nothing more than the mind making associations and arriving by habit at causal connections between phenomena. Hume's radical conclusion awakened Immanuel Kant

²¹ Boring, 246.

²² Kurt Danziger, "Wundt's psychological experiment in the light of his philosophy of science," *Psychological research*, 42 (1980), 109-122; Kurt Danziger, "Wundt and the two traditions in psychology," in *Wilhelm Wundt and the making of a scientific psychology* ed. Robert W. Rieber (NY: Plenum, 1980), 73-87.

(1724-1804) from his dogmatic slumbers in Königsberg and set him to writing his monumental works on philosophy and the foundations of natural science.

Kant's careful definition of natural science gave psychology an ambiguous status.²³ His *Critique of pure reason* (1781) argued that scientific knowledge is more than empirical psychology, that human understanding is dependent upon a few necessary, innate mental categories such as space and time, and that mathematical representation is the key to real scientific knowledge. These fundamental mental categories, a more restricted group than Cartesian innate ideas, comprise the foundation of science itself. Concerning the study of psychology, on the other hand, Kant's *Metaphysical foundations of natural science* (1786) expressed doubts that it could ever be scientific. Psychology was destined to be "merely empirical"; it could not become a "natural science proper" because it could not use mathematics to construct its fundamental concepts.

For Kant psychology was not mathematical, nor was it experimental: controlled experiments such as those used in physics were not possible, because introspective reports of mental phenomena by individuals were not strictly objective. In *Anthropology from a pragmatic point of view* (1798) Kant proposed making psychology a better empirical study by more objective observations of wide areas of human behavior, including historical and cultural manifestations. The Kantian attitude toward psychological experiment was hardly challenged until Fechner's breakthrough with psychophysics in 1860. In the meantime, there was some important discussion on the role of mathematics.

Johann Friedrich Herbart (1776-1841), a successor to Kant's chair in Königsberg and later professor in Göttingen, agreed that psychology could not be studied by the experimental method. He insisted, however, that mental phenomena could in principle be represented mathematically. Mathematics could make psychology an exact science, if not an experimental one. Herbart's major treatise, *Psychology as a science, newly grounded upon experience, metaphysics, and mathematics* (1824/25) developed these ideas.²⁴

²³ David E. Leary, "Immanuel Kant and the development of modern psychology," in *The problematic science: Psychology in nineteenth-century thought* ed. William R. Woodward and Mitchell G. Ash (NY: Praeger, 1982), 17-42. See also David E. Leary, "the philosophical development of the conception of psychology in Germany, 1780-1850," *Journal for the history of the behavioral sciences*, 14 (1978), 113-121, where the positive and negative effects of Kant's pronouncements on psychology are traced through his philosophical followers.

²⁴ On Herbart, see Boring, 246-261, and Fritz Blättner, *Geschichte der Pädagogik*, 2nd ed. (Heidelberg: Quelle & Meyer, 1953), 173-200.

Using a conception similar to Leibnizian monads, Herbart described the mind as a complex of *Vorstellungen* (literally “presentations,” they include sensations, reflections, ideas, etc.). Supposing that these mental elements vary in intensity and in time, Herbart developed a mechanics of *Vorstellungen* to represent mental phenomena mathematically. *Vorstellungen* with sufficient strength and in supportive configurations with those surrounding them define the conscious part of mind; those lacking strength and those suppressed by nearby *Vorstellungen* make up the unconscious part. Herbart gave Leibniz’s term, apperception, a rather specific meaning in his model. Perception occurs when a *Vorstellung* enters the mind; apperception occurs when that *Vorstellung* is contextualized so as to secure its position in consciousness. Lacking strength or support, a *Vorstellung* might slip into the mass of *Vorstellungen* that make up the unconscious part of the mind. This is forgetting. By the same token, a shift of configuration might allow a *Vorstellung* to rise into consciousness. This is remembering something which was forgotten.

Herbart devised his system of psychology in connection with his educational theories. These were inspired by the great Swiss educator, Johann Friedrich Pestalozzi (1746-1827), whom Herbart had known during his early career as a tutor. The matrix of interactive bits of knowledge presented a useful model to those whose profession it was to fill young minds, so Herbartian psychology became popular with teachers. It challenged them to teach contextually and to realize that individuals had unique learning capacities according to their personal patterns of meaning.

When Wundt started publishing on psychology in the 1860s, Herbart’s theories dominated academic psychology in German-speaking universities. Moritz Drobisch (1802-1896) at Leipzig extended the mathematical interpretations and developed statistical methods. Wilhelm Fridolin Volkmann (1821-1877) at Prague produced a Herbartian textbook on psychology, the most popular one in German universities until Wundt’s general psychology textbook appeared near the end of the century.²⁵

In general the Herbartians had little interest in anatomy and physiology. A notable exception was Theodor Waitz (1821-1864) at Marburg, who suggested that the research results of Johannes Müller and

²⁵ Wilhelm Fridolin Volkmann, Ritter von Volkmar, *Lehrbuch der Psychologie vom Standpunkte des Realismus und nach geneitlicher Methode*, ed. C.S. Cornelius, 4th ed., 2 vols. (Cöthen: Otto Schulze, 1894/95). The first edition was published in 1856, with the lead word, *Grundriss*, instead of *Lehrbuch*.

others could give scientific backing to the psychology of Herbart.²⁶ Toward the end of his short career, Waitz joined Moritz Lazarus (1824-1903) and Hajim Steinthal (1823-1899) in promoting *Völkerpsychologie* (ethnopsychology). By indicating the importance of physiology and *Völkerpsychologie* Waitz anticipated Wundt's work by twenty years, but was unable to carry it out.

Herbart's successor as professor of philosophy in Göttingen, Rudolph Hermann Lotze (1811-1881), had more success in establishing a connection between physiology and psychology. Lotze was an influential teacher and writer who embodied the German double-aspect view of psychology. After studying natural science and medicine in Leipzig under E.H. Weber and Fechner, he decided to devote his logical and critical rigor to philosophy. He contributed two important articles to Wagner's *Handwörterbuch*, the reference work that gave wide audience to E.H. Weber's findings on just-noticeable differences. In "Life, life force" [Leben, Lebenskraft] Lotze criticized contemporary usage of "vital force" as explanation in physiology, stating that the term explained nothing. In "Mind, mental life" [Seele, Seelenleben] he argued that although mechanistic explanations should be sufficient for organic phenomena, mental actions are something beyond the merely organic.²⁷

Lotze's writings inspired opposing trends in thought. The materialist writers of the 1850s and 1860s were encouraged by the first article but ignored the message of the second. Antimaterialists hailed Lotze's philosophy because it took account of scientific research but was essentially spiritualistic.²⁸ Lotze's major work on psychology, *Medical psychology, or physiology of the mind* [*Medizinische Psychologie, oder Physiology der Seele*] (1852), systematized the results of physiological research for philosophical psychology and for the treatment of mental diseases, but Lotze did not call for an independent program of experimental psychology. Nevertheless, some of Lotze's ideas, particularly his theory of "local signs" for spatial perception, specified psychological components to some of the perceptual problems under study by physiologists. Accordingly, Helmholtz and others included psychological explanations in their treatises on sensory physiology.²⁹ The historian Merz probably went too far in his

²⁶ Theodor Waitz, *Grundlegung der Psychologie nebst einer Anwendung auf das Seelenleben der Thiere, besonders die Instincterscheinungen* (Hamburg and Gotha: Perthes, 1846); *Lehrbuch der Psychologie als Naturwissenschaft* (Braunschweig: Vieweg, 1849).

²⁷ Hermann Lotze, "Leben und Lebenskraft," in *Handwörterbuch der Physiologie*, ed. Rudolph Wagner, vol. 1 (Braunschweig: Vieweg, 1842), ix-lviii; "Seele und Seelenleben," *ibid.*, vol. 3 (1846), 142-264.

²⁸ Frederick Gregory, *Scientific materialism in nineteenth-century Germany* (Dordrecht: Reidel, 1977).

²⁹ William R. Woodward, "From association to gestalt: The fate of Hermann Lotze's theory of spatial perception,

claim that "modern psychology may be dated from Lotze's writings,"³⁰ but certainly Lotze influenced many who were part of the beginning of modern psychology. He was in fact the teacher of several of Wundt's early rivals in German psychology--Franz Brentano, Carl Stumpf, and G.E. Müller (see Chapter Seven).

C. Wundtian psychology: Critical perspectives.

In the 1860s Wilhelm Wundt brought his background in experimental physiology to bear on questions of philosophical psychology and established a research program in experimental (alternatively, physiological) psychology in the 1870s and 1880s. There is virtually no disagreement on that statement, nor on the assertion that Wundt's enterprise was a success, at least for a time. Arguments abound, however, about what happened then. The issue of the scientific status of experimental psychology emerged by 1900, and then psychology failed to become a separate discipline in Germany until the mid-twentieth century. Wundt's achievement looks problematic in the light of these facts.

Edwin Boring was able to avoid these problems by characterizing the Wundtian *Zeitgeist* in terms of British associationist philosophy and German physiology, and by underplaying the role of German idealism. In this way he showed a smoothly cumulative growth of scientific psychology from Wundt to twentieth-century American psychologists, whose thinking was far removed from nineteenth-century German philosophy. The present study, on the contrary, finds that idealistic philosophy played an extremely important role in German experimental psychology, at least up to World War I.

Using Boring's account, sociologists of science Joseph Ben-David and Randall Collins have made Wundt's establishment of experimental psychology into a case study in the emergence of a new scientific discipline. The intellectual background for experimental psychology, they argue, was available in much of Europe; it was the institutional structure that made Germany the unique site of the birth of scientific psychology.³¹ Competition between German universities favored the rapid growth of new

1846-1920," *Isis*, 69 (1978), 572-582.

³⁰ John Theodore Merz, *A history of European thought in the nineteenth century*, vol. 3 (Edinburgh: W. Blackwood, 1912; reprinted NY: Dover, 1965), 268.

³¹ Joseph Ben-David and Randall Collins, "Social factors in the origins of a new science: The case of psychology," *American sociological review*, 31 (1966), 451-465. The case of German psychology is an exemplary one in a full-length study: Joseph Ben-David, *The scientist's role in society, a comparative study* (Englewood Cliffs, New Jersey: Prentice-Hall, 1971).

fields of science, first physiology and then psychology. Physiology had high prestige in mid-nineteenth-century Germany, whereas philosophy there had declined since the death of Hegel in 1831. When Wundt was unable to compete successfully for a full professorship of physiology, he executed a role-hybridization and promoted physiological psychology to reform philosophy. The new hybrid discipline thrived on prestige transferred from the scientific field, and the new field thrived also in America, where higher education was decentralized and competitive, as in Germany.

Historians William Woodward and Mitchell Ash have identified problems in the sociologists' explanation. They disagree that philosophy was suffering such a problem of low esteem, and they point out, more importantly that in Germany, the land of "take-off into sustained growth," there was really no separate discipline of psychology until after World War II. They have concluded that "the possibility of psychology as a science first emerged" in the nineteenth century, but "psychology did not fully emerge as an autonomous discipline until the twentieth century."³²

Ash considered the competition for chairs in philosophy in German universities and found that the institutional structure in fact hindered the emergence of experimental psychology as a new academic discipline. Although Wundt and a few others were able to function as both philosopher and psychologist, true specialists in psychology did not have a secure place in the German universities until well into the twentieth century. In choosing whether to be primarily philosophers or psychologists, the most successful scholars chose philosophy, which still was, contrary to the argument of the sociologists, a very prestigious field in the German university. The few who did specialize in psychology paid the price in lowered prestige and less influence in the academic system.³³

Woodward supports Ash's picture by characterizing Wundt as an old-fashioned philosopher more than a psychologist: "Wundt's profession belongs to a bygone era; for him, psychology was the foundation for an interdisciplinary concern, the unity of knowledge."³⁴ The "will to system" led Wundt to

³² William R. Woodward, "Stretching the limits of psychology's history," in *The problematic science: Psychology in nineteenth-century thought* ed. William R. Woodward and Mitchell G. Ash (NY: Praeger, 1982), 1-14; 1.

³³ Mitchell G. Ash, "Academic politics in the history of science: Experimental psychology in Germany, 1879-1941," *Central European history*, 13 (1980), 255-286.

³⁴ William R. Woodward, "Wundt's program for the new psychology: Vicissitudes of experiment, theory and system," in William R. Woodward and Mitchell G. Ash, *op. cit.*, 167-197; 169.

spend his time writing systematic and synthetic books on many different subjects, rather than producing research reports of discrete scientific advances; his call for interdisciplinary studies was out of step with the development of university scholarship, even in conservative Germany.

In an analysis that is almost contrary to Woodward's, a West German psychologist, concerned about the splintered state of his discipline today, suggests that Wundt restricted the scope of psychology too much. Carl Graumann notes that Wundt called for a new science in the 1860s that would include, besides experimental psychology, the study of historical psychology, anthropology, sociology and psychoanalysis (of sorts). From the "Heidelberg program" for "an evolutionary and historical social psychology of the conscious and unconscious mind and action,"³⁵ Wundt narrowed his "Leipzig program" to highly controlled experimental investigations of simple conscious processes on the one hand and historical/empirical compilations of the *Völkerpsychologie* on the other. The first part of the Leipzig program produced the scientific psychology above which Boring wrote; the second part and all the rest of the "Heidelberg program" developed outside of academic psychology.

Wundt's identity as both philosopher and psychologist has presented special problems for Marxist historians in Eastern Europe, particularly because Lenin's major philosophical work referred to Wundt as a "muddled idealist."³⁶ The Marxist framework assumes the progressive growth of science toward true knowledge of the real world, and Marxist writers criticize Western thinkers like Kuhn for failing to support the philosophical primacy of this progress.

Despite this shared conviction, Marxist historians and philosophers of science have no unified position on Wundt. The Soviet psychologist and philosopher Yaroshevskii was reluctant to allow the idealistic philosopher any significant role in founding the "progressive and materialist" science of psychology. Wundt's methodology was, in his view, not scientific, and the progress in psychology during Wundt's lifetime is to be found in the work of certain German and Russian physiologists on sensa-

³⁵ Carl 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: "Wundt vor Leipzig--Entwürfe einer Psychologie," in Wolfram Meischner and Anneros Metzge, eds., *Wilhelm Wundt--progressives Erbe. wissenschaftsentwicklung und Gegenwart* (Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig, 1980), 63-77.

³⁶ Vladimir Ilyich Lenin, *Materialismus und Empirio-kritizismus: Kritische Bemerkungen über eine reaktionäre Philosophie* (Leipzig: Philipp Reclam, 1980), 52. Russian original, 1909.

tion and behavior.³⁷

Finding a much more important role for Wundt, psychologist Wolfram Meischner recalls that the Marxist-Leninist philosophy of dialectical materialism teaches the historical necessity of contradictions and controversies in progressive developments. Accordingly, Wundt's contributions to scientific psychology can be part of the "progressive heritage," even if his idealistic philosophy cannot.³⁸

In honor of the centennial of the Leipzig Institute for Experimental Psychology, a group of Leipzig scholars under Meischner's chairmanship evaluated Wundt's contributions to a variety of fields of study. Anneros Metge-Meischner discussed Wundt's methodology for experiments in psychology: the synthesis of psychophysical and chronometric techniques and their application to explicitly psychological questions.³⁹ Once the genie of exact, quantitative methods was released, even its liberator, retreating into a class and time-bound idealism, could not put it back into the bottle. Metge's general point about the importance of Wundt's experimental program has been supported by Marxist and non-Marxists alike. For example, the directors of the Archive for History of American Psychology in Akron, Ohio, have documented the extraordinary persistence of Wundt's laboratory apparatus in America, after Wundtian theories had given way to very different ways of framing psychological questions.⁴⁰

In spite of the historiographical complexity surrounding Wundt and early psychology, everyone at least agrees that his founding of the Institute for Experimental Psychology at Leipzig represents a landmark in the history of experimental psychology. This dissertation therefore concentrates on the

³⁷ Mikhail Grigorevitch Yaroshevskii, *Psychologie im 20. Jahrhundert, theoretische Entwicklungsprobleme der psychologischen Wissenschaft* (Berlin [GDR]: Volk und Wissen, 1975), 110-122. Russian original, 1974.

³⁸ Wolfram Meischner, "Wilhelm Wundt--Hauptetappen seines Lebenswerkes," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschaft- und Sprachwissenschaftliche Reihe*, 28 (1979), 171-179; "Widersprüche im Wundtbild der Gegenwart," *Beiträge zur Wundt-Forschung II* (Wissenschaftliche Beiträge der Karl-Marx-Universität, Reihe Psychologie, 1977), 7-21; "Die Anwendung marxistisch-leninistischer Prinzipien der Psychologiegeschichte auf die Wundtforschung," in *Psychologiehistorische Manuskripte* (Berlin [GDR]: Gesellschaft für Psychologie der DDR, 1977), 30-34.

³⁹ Anneros Metge, "Zur Methodenlehre Wilhelm Wundts und zu frühen experimentalpsychologischen Arbeiten im Leipziger Institut für experimentelle Psychologie," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschaft- und Sprachwissenschaftliche Reihe*, 28 (1979), 181-186. A detailed study of the contributions of the physiologists and Fechner is the same author's *Zur Herausbildung der Experimentalpsychologie unter besonderer Berücksichtigung des Beitrages von Wilhelm Wundt* (Dissertation A, Karl-Marx-Universität Leipzig, 1977).

⁴⁰ John A. Popplestone, "The influence of the apparatus of the Leipzig laboratory in the United States: 1880-1910," in *Wilhelm Wundt--progressives Erbe, wissenschaftsentwicklung und Gegenwart* ed. Wolfram Meischner and Anneros Metge (Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig, 1980), 158-163; Marion White McPherson, "The persistence of the apparatus of the Leipzig laboratory in the United States," *ibid.*, 164-171; John A. Popplestone and Marion White McPherson, "The vitality of the Leipzig model of 1880-1910 in the United States in 1950-1980," in *Wundt studies, a centennial collection* ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: C. J. Hogrefe, 1980), 226-257 (includes illustrations).

formation of the Institute, its development and early influence on psychology as a discipline. This focus allows a selection from Wundt's writings and from publications in early psychology. Such selection is necessitated by the volume of the material. Wundt's career was long—he lectured in the university for sixty years—and the scope of his interests was wide. His writings on formal areas of philosophy (logic, ethics, metaphysics, and history of philosophy) are not completely separable from those on experimental psychology; yet that cannot receive detailed attention here. Likewise, Wundt's *Völkerpsychologie* (ethnopsychology), published mostly after 1900, is considered only in its relation to Wundt's vision of psychology as a whole.

Boring characterized the *Zeitgeist* that called forth and blessed Wundt's experimental psychology in terms of British associationist philosophy and German physiology. Those ingredients of Wundt's thinking which resonated so strongly with two or three generations of researchers and which established experimental psychology can be more accurately and meaningfully described as German idealistic philosophy and what I call the "Comtean spirit." German philosophy, as already noted, regarded body and mind together or in parallel. Comtean spirit is a way to characterize the confidence that a science of psychology is possible. (The word "positivism" is avoided, because that term comes up later with a meaning almost opposite to the sense of the Comtean spirit.)

Boring did not include the French writer Auguste Comte (1798-1857) in his background to Wundt and experimental psychology,⁴¹ and there is no obvious reason why he should have. Comte's writings probably had little direct influence on Wundt, especially since Comte's later, mystical writings supporting a "religion of science" complicated the reception of his ideas by scientists. Moreover, on the possibility of scientific psychology, Comte himself was decidedly negative, for reasons similar to Kant's. Comte's ideas, nevertheless, had far-reaching effects on the general thought of the nineteenth century. As used in this dissertation, Comtean spirit simply refers to the widespread conviction that the methods of natural science should be used to investigate organic and behavioral phenomena; new disciplines, patterned on mathematical sciences like physics, would then issue forth in an age of scientific and

⁴¹ Boring, 633-634, mentions Comte only in the chapter on behavioristics, where he distinguishes between Comte's positivism of the early nineteenth century, Mach's positivism of the late nineteenth century, and logical positivism of the post-World-War-I period. Chapters Seven and Eight discuss these new trends of thought.

technological progress.⁴²

The assignment of such productive role to German idealism may raise Marxist eyebrows, among others, but of course the thought of the idealist Hegel was also essential to that scientist of economy and society, Marx, an exemplar of the Comtean spirit if ever there was one. The German idealistic tradition preserved the double-aspect view of psychology, and the Comtean spirit encouraged the experimental investigation of mental as well as physiological processes. One fruit of the Comtean spirit was a new discipline, as emphasized by Boring, Ben-David and Collins. Eventually the marriage of the Comtean spirit and German idealism dissolved, due to weakening of the former and to growth and redirection of the latter. At that point the problems pointed out by Woodward and Ash come to the fore. Had the marriage already produced thriving offspring? How did it fail?

The formation, reception and institutionalization of Wundtian psychology and then its fragmentation in the early twentieth century were shaped by the dynamics of the German university system. Analysis of these developments will follow the order of their appearance in Wundt's career.

The next two chapters present the origins. Chapter Two examines Wundt's education and early career, tracing his path to psychology through crucial career decisions and illustrating the personal and institutional circumstances that conditioned them. It follows Wundt through his first academic appointments to his arrival at Leipzig. Chapter Three investigates the formation of Wundt's Institute for Experimental Psychology at Leipzig, showing the central role of Wundt's teaching duties and research methods in laying the foundation for experimental psychology's first institute and in launching its first journal, Wundt's *Philosophische Studien*.

The next three chapters present different aspects of the institutionalization of experimental psychology in universities. Chapter Four examines the unique scientific content and characteristic social organization of research within the model for the institutionalized discipline, Wundt's Leipzig Institute, emphasizing the central importance of reaction-time studies in defining the Institute's research program. Chapter Five follows the fairly rapid spread of Leipzig psychology into the non-German academic world

⁴² Stanislav Andreski, "Introduction: Comte's place in the history of sociology," in Auguste Comte, *The essential Comte, selected from "Cours de philosophie positive"*, ed. Stanislav Andreski, trans. Margaret Clarke (NY: Barnes & Noble, 1974), 7-18.

from 1880 to 1895, giving particular attention to why experimental psychology was more successful in America than elsewhere. Chapter Six traces the successes, sometimes qualified, of Wundt's model in the German-speaking universities in the decade from 1887 to 1897.

The final chapters are marked by themes of challenge and relative decline. Chapter Seven shows that, soon after its initial success, Wundt's model was contested in Germany by competing approaches in both the experimental and the philosophical modes. The chapter argues that philosophical issues increasingly dominated discussions at the expense of questions which were more accessible to experiment. Wundt became more isolated from productive trends in experimental psychology, even though he continued to hold a position of great personal authority. Chapter Eight examines the intellectual and institutional fragmentation of psychology between 1896 and 1914, as Wundt struggled to find a successor in the *Leipzig Institute*, his own followers moved in different directions, and competing approaches to psychology gained ground.

The closing chapter looks at the circumstances of Wundt's retirement during the World War and then assesses Wundt's achievement. It argues that the strengths of Wundt's institutional setting at Leipzig, of his organization skills, and of his initial research program were eventually offset by his inability to synthesize a growing body of research results and by the failure of psychologists in the philosophical environment of the turn of the century to reach a working consensus on the nature of mental activity. In spite of these problems, Wundt's achievement was sufficient to establish the field of psychology permanently, if not separately, in Germany.

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.¹ 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.

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).² 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

¹ Wolfgang 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.

² The 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.*

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 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 Heildelsheim, 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. Heildelsheim was a religiously integrated community, with a sizeable minority of Catholics and even a few hundred Jews with their own synagogue and school.³ 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 purpose was to show the features common to them all.⁴ Wundt's later anthropological writings produced a more sophisticated version of the same theme.

Heildelsheim also had its share of political strife. Church officials described the community as

³ Max 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.

⁴ Wundt, *Erlebtes und Erkantes* (Stuttgart: Kröner, 1920), 199.

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.

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."⁵ Starting with these earliest memories volunteered by 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."⁶ Apparently Mrs. Wundt could be strict, too.

In 1840 grandfather Arnold died and Wundt's father suffered 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

⁵ Solomon Diamond, "Wundt before Leipzig," *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum, 1980), 3-70; 8. Hereafter Diamond.

⁶ Wundt, *Erlebtes und Erkanntes*, 37.

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.⁷

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 want to study theology.⁸ 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.

⁷ Wundt 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.

⁸ Wolfgang 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 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 the revolution in Germany. Some of the rebels were captured; others fled to Switzerland or 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.⁹

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 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 1846,¹⁰ 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.¹¹

⁹ Wundt, *Erlebtes und Erkantes*, 72.

¹⁰ For 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.

¹¹ Wundt, "Ueber den Kochsalzgehalt des Harnes," *Journal für praktische Chemie*, 59 (1853), 354-363. Carl

In spite of the attraction of chemistry, physiology was 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:¹²

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.]¹³

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 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

Ludwig, *Lehrbuch der Physiologie des Menschen*, 2 vols., 2nd ed. (Heidelberg: Winter, 1858-1861).

¹² Wundt'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.

¹³ Wundt, *Erlebtes und Erkanntes*, 73-74.

recurrens nerves in rabbits. He worked in secret, perhaps so he could surprise his uncle, the professor who set the problem.¹⁴ To his great satisfaction he shared first prize with a student "who had been helped by his professor."¹⁵ Wundt's long article, which his mother helped him prepare, was accepted by Johannes Müller for his important journal.¹⁶ 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.¹⁷ 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.

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."¹⁸

¹⁴ Diamond, 19-20.

¹⁵ Wundt, *Erlebtes und Erkanntes*, 83.

¹⁶ Wundt, "Versuche über den Einfluss der Durchschneidung des Lungenmagennerven auf die Respirationsorgane," *Archiv für Anatomie, Physiologie und wissenschaftliche Medicin*, 1855, 269-313.

¹⁷ Wundt, *Erlebtes und Erkanntes*, 90-94.

¹⁸ Wundt, *Erlebtes und Erkanntes*, 97.

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."¹⁹ 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 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

¹⁹ Diamond, 20.

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.²⁰ 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.²¹

In the Heidelberg environment, that of his energetic and orderly grandfather, Wundt became a scientist and scholar. When 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.²²

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.²³ 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

²⁰ Wundt, "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: Engelmann, 1911), 426-490.

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

²² Curiously, 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.

²³ Woodward 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.

studies.” [So war die Klinik die erste Station, die mich auf dem Wege eigener experimenteller Arbeiten zuerst zur Psychologie führte, ehe ich noch mich gründlich mit philosophischen Studien beschäftigt hatte.]²⁴ 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.²⁵

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.²⁶ 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.

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.”²⁷

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

²⁴ Wundt, *Erlebtes und Erkanntes*. 101.

²⁵ Wundt, *Beiträge Zur Theorie der Sinneswahrnehmung* (Leipzig: C.F. Winter, 1862), 45.

²⁶ Wundt, *Die Veränderungen der Nerven in entzündeten und degenerierten Organen* (Heidelberg: Mohr, 1856).

²⁷ Wundt, *Erlebtes und Erkanntes*. 105.

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 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.²⁸ The studies on muscles were later expanded into Wundt's first book, published after he returned to Heidelberg.

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."²⁹ Writing his memoirs in extreme old age, Wundt identified himself with this father of German physiology rather than with du Bois-Reymond, who

²⁸ Wundt, "Ueber die Elasticität feuchter organischer Gewebe," *Archiv für Anatomie, Physiologie und wissenschaftliche Medicin* (1857), 298-308.

²⁹ Wundt, *Erlebtes und Erkanntes*, 113-114.

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 academic career as a physiologist, a period characterized by Titchener as “seventeen years of depression.”³⁰ 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 Wundt’s brother Ludwig, then a legal official in Mannheim, was

³⁰ Edward B. Titchener, “Wilhelm Wundt,” *American journal of psychology*, 32 (1921), 161-178; 171n.

summoned to the sickbed. Although Wundt's memoirs do not specify the reason for the hemorrhage, it was almost certainly tuberculosis.¹

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.² Probably upon the advice of his uncle, Friedrich 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.³

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.⁴ The Berlin physiologist sent a polite note of thanks, but Wundt suspected that he never took the time to read it.⁵ Wundt surmised that the leader of the reductionist school of physiology was not pleased by his preface, which acknowledged

¹ This is the diagnosis by Bringmann *et al.*, 25.

² Wundt to Friedrich Sander, 18 March 1915, UAL, Wundt Nachlass, Nr. 1430a1.

³ Felix 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.

⁴ Wundt, *Die Lehre von der Muskelbewegung, nach eigenen Untersuchungen bearbeitet* (Braunschweig: Vieweg, 1858).

⁵ Emil du Bois-Reymond to Wundt, [1858], quoted in Schlotte, 335. Wundt, *Erlebtes und Erkanntes*, 147.

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 article in his extended debate with Weber.⁶ 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.⁷

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].⁸ 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 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

⁶ A.W. Volkmann to Wundt, 15 May 1858, UAL, Wundt Nachlass, Nr. 1535.

⁷ The mixed reviews are discussed by Diamond, 26.

⁸ Wundt, *Erlebtes und Erkanntes*, 148.

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.⁹

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.

⁹ Hermann Helmholtz to Wundt, 5 August 1858, quoted in Schlouze, 335-336. Diamond, 29, incorrectly gives the date of this letter as 5 May 1858.

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 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.¹⁰ In spite of the chilly atmosphere in the institute, the proximity to Helmholtz, Bringmann *et al* suggest, probably inspired Wundt's work.¹¹

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 1867.¹²

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 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.¹³ 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

¹⁰ I.M. Sechenov, *Autobiographical notes*, ed. Donald B. Lindsley, trans. Kristan Hanes (Washington, D.C.: American Institute of Biological Science, 1965), 89.

¹¹ Bringmann *et al*, 26-27.

¹² Hermann 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.

¹³ Wundt, *Erlebtes und Erkanntes*, 161.

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 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 1864.¹⁴ 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 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

¹⁴ It 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. Schlöte, 335, gives 1863, and Bringmann, 25-26, gives 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.

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.¹⁵

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 1866.¹⁶

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.¹⁷ He dutifully taught microscopic 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

¹⁵ Timothy Lenoir, "Models and instruments in the development of electrophysiology, 1845-1912," *Historical studies in the physical and biological sciences*, 17:2 (1986), 1-54.

¹⁶ Wundt, *Die physikalischen Axiome und ihre Beziehung zum Causalprinzip. Ein Capitel aus einer Philosophie der Naturwissenschaften* (Erlangen: F. Enke, 1866).

¹⁷ The list of Wundt's lectures is given in Eleonore Wundt, *Wilhelm Wundt's Werk, ein Verzeichnis seiner sämtlichen Schriften (Abhandlungen der sächsischen staatlichen Forschungsinstitute. Forschungsinstitut für Psychologie, Nr. 28)* (Munich: Beck, 1927), 69-71.

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 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].¹⁸

Wundt's physiology textbooks were more successful. Perhaps through Helmholtz's arrangements with the publisher,¹⁹ 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.²⁰

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."²¹ Understandably, Wundt emphasized his 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.

¹⁸ Wundt, *Vorlesungen über die Menschen- und Thierseele*, 2 vols. (Leipzig: Voss, 1863). 2nd ed., 1 vol., 1892.

¹⁹ Bringmann *et al.*, 26.

²⁰ Wundt, *Lehrbuch der Physiologie des Menschen* (Erlangen: F. Enke, 1864-65); *Handbuch der medicinische Physik* (Erlangen: F. Enke, 1867). See Eleonore Wundt, *Wilhelm Wundts Werk*, for a listing of editions and translations.

²¹ Ernst Meumann, "Wilhelm Wundt zu seinem achtzigsten Geburtstag," *Deutsche Rundschau*, 152 (1912), 193-224: 198.

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.²² 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.²³ To the popular magazine *Gartenlaube* Wundt contributed articles on the "speed of thought" and "how death came into the world."²⁴ 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.²⁵

²² Wundt, *Erlebtes und Erkantes*, 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.

²³ Wundt, "Der Blick, eine physiologische 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.

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

²⁵ Wundt, *Erlebtes und Erkantes*, 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]." ²⁶ 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. 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. ²⁷

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

²⁶ Wundt, *Erlebtes und Erkanntes*, 19.

²⁷ Wundt, *Erlebtes und Erkanntes*, 20.

after the first, decisive battle at Königgrätz.²⁸ 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 1870.²⁹

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 democrat of the period.³⁰ 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.³¹ 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.

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

²⁸ Wundt, *Erlebtes und Erkanntes*, 27.

²⁹ Wundt, *Erlebtes und Erkanntes*, 29.

³⁰ Peter Petersen, *Wilhelm Wundt und seine Zeit* (Frommanns Klassiker der Philosophie, vol. 13) (Stuttgart: Frommann, 1925), 27.

³¹ Wundt 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.

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.]³²

³² Wundt to Sophie Mau, 27 May 1872, quoted in Wolfram Meischner and Erhard Eschler, *Wilhelm Wundt* (Leipzig: Urania, 1979), 40-42.

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 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 Medizinern 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 Brillenschleifen, 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.]³³

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,³⁴ 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.

³³ Wundt to Sophie Mau, 15 June 1872, quoted in Wolfgang Meischner and Erhard Eschler, *Wilhelm Wundt* (Leipzig: Urania, 1979), 58-59.

³⁴ Translated 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. Straight-forward 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.³⁵ 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 1862.³⁶ 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 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 1862,³⁷ 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

³⁵ Wundt, "Über die Bewegung des Auges," *Archiv für Ophthalmologie*, 8 (1862), 1-87; "Beschreibung eines künstlichen Augenmuskelsystems zur Untersuchung der Bewegungsgesetze der menschlichen Auges im gesunden und kranken Zustand," *ibid.*, 88-114.

³⁶ Appeared in *Hentle und Pfeufers Zeitschrift für rationelle Medicin*.

³⁷ Wundt, *Beiträge zur Theorie der Sinneswahrnehmung* (Leipzig: C.F. Winter, 1862).

FIGURE 2.1

Wundt's Ophthalmotrope.

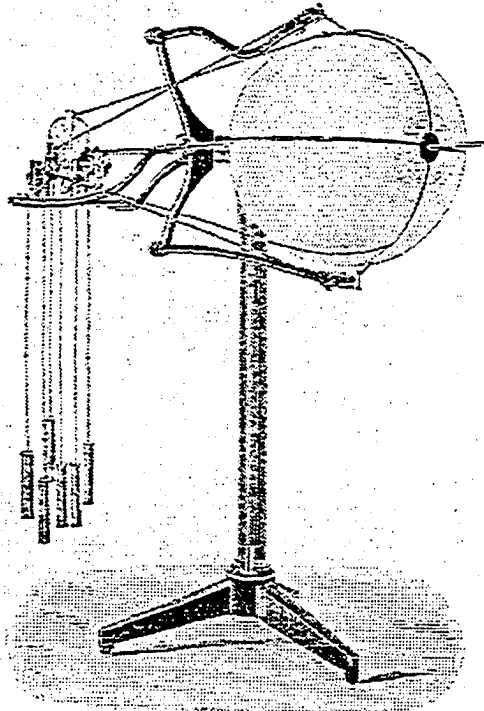


Fig. 252. Ophthalmotrop.

Wundt, Grundzüge der Physiologischen Psychologie, 5th ed., vol. 2
(Leipzig: Engelmann, 1902), 534.

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.³⁸

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 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.³⁹ In the *Beiträge* and *Vorlesungen* of the early

³⁸ Henry 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.

³⁹ He 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. Wolfgang G. Bringmann and

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 Friedrich Graumann has suggested that this separation was unfortunate because it has led to the splintering of psychology as a field.⁴⁰ 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.⁴¹ 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.

Ryan D. Tweney (Toronto: C. J. Hogrefe, 1980), 42-70: 43.

⁴⁰ Carl 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.

⁴¹ William Coleman, *Biology in the nineteenth century: Problems of form, function, and transformation* (Cambridge: Cambridge U. Press, 1977), 160-166.

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 opportunisticly connected Wundt's concept to his own theory of the unconscious. The retired Prussian army officer and 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.⁴² 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.⁴³ 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 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.

⁴² Eduard von Hartmann, *Philosophie des Unbewussten* (Berlin: Duncker, 1869).

⁴³ See Diamond, who covers these developments in detail.

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."⁴⁴

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.⁴⁵ 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 Sinneempfindungen an wieder zu gewinnen.]⁴⁶

⁴⁴ Bringmann *et al.*, 29.

⁴⁵ Bringmann *et al.*, 28.

⁴⁶ Helmholtz to [University of Marburg], 1873, quoted in Schlott, 337.

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 "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].⁴⁷ 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

⁴⁷ Wundt, *Erlebtes und Erkanntes*, 242.

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 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 *Literarisches Zentralblatt für Deutschland*. Wundt had been writing for Zarncke's magazine since 1871, contributing over seventy short reviews of physiological literature by 1875.⁴⁸

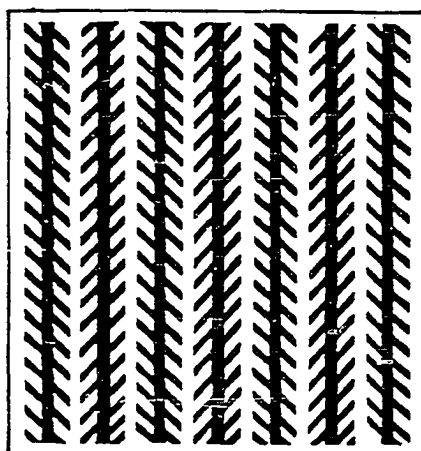
Zarncke, a specialist in modern languages, was clearly interested in hiring a philosopher with scientific background, but it was the astrophysicist Friedrich Zöllner (1834-1882) who was Wundt's most enthusiastic supporter. Zöllner was impressed by Wundt's program for a scientific psychology; he had been 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 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

⁴⁸ Eleonore Wundt, *Wilhelm Wundts Werk*, 7-11.

FIGURE 2.2

Zöllner's Illusion.



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

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."⁴⁹

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 to the physical world reemerged after a generation 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.⁵⁰

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 (the retina is "wired" to

⁴⁹ J.C.F. Zöllner, "Ueber eine neue Art von Pseudoskopie und ihre Beziehung zu den von Plateau und Opper beschriebenen Bewegungsphänomenen," *Poggendorfs Annalen der Physik*, 110 (1860), 500-523; 503.

⁵⁰ J.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 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.⁵¹ 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.⁵²

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.⁵³ At 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.⁵⁴

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

⁵¹ Ewald Hering, *Beiträge zur Physiologie* (Leipzig: Engelmann, 1861-64), 75.

⁵² Wundt, *Grundzüge der physiologischen Psychologie* (Leipzig: Engelmann, 1874), 563-566.

⁵³ Marylyn E. Marshall and Russel A. Wendt, "Wilhelm Wundt, 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.

⁵⁴ Zöllner (1881), translated in Bringmann, *et al.*, 129.

b. Philosophy at Leipzig, how Wundt fit in.

Zarncke, as dean, kept the minutes of the meeting of 5 February 1875.⁵⁵ The report noted that Leipzig University 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 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].⁵⁶ In response to Drobisch's doubts about Wundt, Zöllner again ener-

⁵⁵ Werner Thiermann, "Zur Geschichte des Leipziger 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.

⁵⁶ Wundt, *Erlebtes und Erkanntes*, 295-296.

getically pleaded that Wundt be offered the professorship of philosophy.⁵⁷

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 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."⁵⁸ 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].⁵⁹ 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.⁶⁰

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 this--professors of philosophy were an

⁵⁷ Thiermann, *op. cit.*, 134.

⁵⁸ Wundt to Friedrich Zarncke, 6 May 1875, translated in Bringmann *et al.*, 128.

⁵⁹ Schlotte, 338.

⁶⁰ Thiermann, *op. cit.*, 136.

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.⁶¹ 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 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.⁶² 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.

⁶¹ J. Conrad, "Allgemeine Statistik der deutschen Universitäten," in *Die Deutschen Universitäten (für die Universitätsausstellung in Chicago 1893, unter Mitwirkung zahlreicher Universitätslehrer)*, ed. W. Lexis (Berlin: A. Asher, 1893), 115-168; 120, Table I.

⁶² Wolfgang G. Bringmann and Gustav A. Ungerer, "The foundation of the Institute for Experimental Psychology," *Psychological research*, 42 (1980), 5-18; 12.

Chapter III

Establishment of the Institute for Experimental Psychology at Leipzig, 1875-1883.

Wundt announced his intentions to establish a new branch of science already in 1862, in the introduction to his second book, *Beiträge zur Theorie der Sinneswahrnehmung*; in the following twenty years he carried out his plan by (1) working out the basic methodology, (2) inventing and improving applications of apparatus, (3) writing textbooks, (4) establishing a specialized institute, and (5) publishing a specialized journal for the field.

These steps were by no means always separate and distinct. Wundt arrived in Leipzig with a methodology, some apparatus, and at least one very important text, *Grundzüge der physiologischen Psychologie*. He refined and supplemented these tools as he created a functional role for experimental psychology in the academic environment in Leipzig. Wundt masterfully used existing financial and pedagogical imperatives to the advantage of his own intellectual pursuits. In particular, he attracted many doctoral students to help him carry out his ambitious program for scientific psychology as the basis of philosophy.

A. Getting a place and getting money for equipment.

1. The psychological laboratory in the context of teaching and personal research.

Wundt published this sketch of the founding of his famous institute at Leipzig, thirty years after its establishment:

When the present director of the Institute for Experimental Psychology joined the faculty of the University on October 1, 1875, the Royal Ministry, with the concurrence of the Academic Senate, placed at his disposal a small former lecture hall in the refectory building for the storage of his demonstration equipment for his psychological lectures and his equipment for personal experimental work.

From the fall of 1879 on, individual students began to occupy themselves with experimental projects in this room in the refectory building. In this way the first study originating from this seminar came about... Dr. Max Friedrich's investigation into the duration of apperception during simple and complex ideas.... This work began in the winter of 1879 and was published as a dissertation in 1883 and in volume 1 of the "Philosophical Studies".... In the following semesters several students and younger instructors participated in practica and research projects which initially were not listed in the catalogue.¹

¹ Wundt, "Das Institut für experimentelle Psychologie," in *Festschriften zur Feier des 500 jährigen Bestehens der*

Wundt's simple history outlines the academic context of the new field of study: personal research, lectures in psychology, and general needs of advanced students. When he was offered the post in Leipzig, Wundt asked for a storage room for demonstration apparatus for his lectures, such as he had had in Zürich. He said nothing, however, about plans for an institute. He had to build his case for that very carefully.

In his second semester at Leipzig Wundt offered a general lecture course on psychology.² He had the storage room for instruments by March 1876, about the time the lecture course began. It was just a small unused classroom in the old refectory, or *Convict*, but the university furnished it with two cabinets, three tables, and six chairs--at a cost of 231.75 marks.³ Although officially only a storage room, it also functioned as a small laboratory for personal research.

It is significant that the storage room was located near the lecture hall where Wundt taught his course on general psychology. Lecture demonstrations, using the instruments from the nearby store-room, became his trademark. The American psychologist G. T. W. Patrick recalled that Wundt had apparatus "on a long table on the platform in the lecture room and illustrated his lecture with it. This of course was his great innovation."⁴ Such demonstrations were something entirely new to lectures in psychology, which was, after all, a subfield of philosophy. Wundt's psychology course made him internationally famous, and it actually became an attraction for visitors to the city.

These lectures had very large enrollments, and the high level of student interest eventually brought about another use for the instrument collection. Wundt began offering an advanced seminar on psychology [Psychologische Gesellschaft] in his fourth semester at Leipzig, and soon students and "younger instructors" wanted to get hands-on experience in experimental psychology, either informally,

Universität Leipzig (Leipzig: Rektor und Senat der Universität, 1909), vol. 4, 118-119. Translated in Wolfgang G. Bringmann and Gustav A. Ungerer, "The foundation of the Institute for Experimental Psychology at Leipzig University," *Psychological Research*, 42 (1980), 5-18; 11-12.

² A full list of Wundt's lecture courses is given in Eleonore Wundt, *Wilhelm Wundts Werk* (Munich: Beck, 1927), 69.

³ Dorothea Fensch, "Zur Rolle Wilhelm Wundts bei der Institutionalisierung der Psychologie in Leipzig," in *Psychologiehistorische Manuskripte* (I. Herbstsymposium, 29. September bis 1. Oktober 1976, Reinhardbrunn) ed. Georg Eckardt and Dorothea Fensch (Berlin: Gesellschaft für Psychologie der Deutschen Demokratischen Republik, Dezember, 1977), 60-66; 62. Source: Königliches Ministerium des Cultus und öffentlichen Unterrichts (hereafter, KM) to Universitätsrentamt, 13 March 1876, Staatsarchiv Dresden, Ministerium für Volksbildung, Nr. 10281/322 (Personalakte Prof. d. Philosophie Dr. med. Wilhelm Wundt 1876-1932), fol. 5.

⁴ Bird T. Baldwin, ed., "In memory of Wilhelm Wundt," *Psychological review*, 28 (1921), 153-188; 171.

or formally for doctoral research and research publications. Since Wundt had already been doing his own research in the room where the teaching instruments were kept, the space conveniently took on a new role.

Personal research alone might well have been carried out at home. In Zürich Wundt had a storage room near his lecture room, but for a while he also had a small laboratory at home for his personal research.⁵ For most of their lives in Leipzig, from 1878 to 1911, the Wundts lived in E. H. Weber's former flat in the large university-owned building at Goethestrasse 6.⁶ Many university professors lived in that building, just a block away from main classroom buildings, and several did their personal research in the ample quarters there.⁷ But the Wundts did not have a laboratory in their apartment; personal circumstances surely prevented it. Their daughter Eleonore was born in 1876, followed by their son Max in 1879. A daughter Lilli, born in 1880, survived only until 1884. Wundt was forty-four the year his first child came. A late marriage and family was nothing unusual among his peers, but young children in the home made it a less suitable location for experimental research.

In Leipzig, moreover, Wundt had the convenience of living close to his work. It was a very concentrated cultural and intellectual setting. Most university facilities were located either within the bounds of the old city or in the new complex of medical and scientific institutes a few blocks to the south. Wundt did not have to go more than a few steps from home to the lecture hall and his storage-room-cum-laboratory.

2. First students in experimental psychology: mostly from mathematics and science background.

Initially students who were eager to do advanced research in psychology came mainly from the natural sciences and particularly from mathematics. This fact is ironic in light of often-repeated stories about Wundt's lack of scientific ability. G. Stanley Hall, one of the first to participate in experiments in Wundt's laboratory, produced the major printed sources for this knowledge. After Wundt's death Hall

⁵ Wolfgang G. Bringmann and Gustav A. Ungerer, "The establishment of Wundt's laboratory: An archival and documentary study," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 123-157; 124-125.

⁶ The *Personalverzeichnis* of the University of Leipzig gives the addresses of the faculty. A full set of these is available at the Archive of Karl Marx University (hereafter UAL). Wundt himself tells us that he occupied Weber's former apartment. Wundt, *Erlebtes und Erkantes*. (Stuttgart: Kröner, 1920), 292.

⁷ Dorothea Fensch, *op. cit.*, 62.

recalled: "There was then [1878 or 1879] an impression that Wundt was not very scientific, and there were rumors that Helmholtz had found him too inexact as his assistant."⁸ Earlier, in *Founders of modern psychology*, Hall's biographical essay on Wundt was even more matter-of-fact: "...he became for a time an assistant of Helmholtz, who later desiring a helper more accomplished in mathematics and physics, sought another in his place."⁹

Wundt himself protested that Hall's biography of him was "invented, from beginning to end."¹⁰ In fact, it was precisely students of mathematics and natural science who were most enthusiastic about experimental psychology in those early days, when Hall himself was in Leipzig. Perhaps their enthusiasm did not preclude occasional doubts about the scientific status of Wundt's new field and the direction of his work. Hall might have been reflecting students' insecurities with their own choice of study as much as with their teacher's abilities. Certainly Wundt had left his career in medicine and physiology behind. But as a philosopher, he had every intention of incorporating science in his work, and he apparently welcomed interaction with students of science.

Some of Wundt's following was already prepared for him when he arrived in Leipzig. The Herbartian philosophers, Drobisch and Strümpell, had "maintained a friendly relationship between philosophy and the positive sciences [die Tradition eines befreundeten Verhältnisses der Philosophie und der positiven Wissenschaften aufrecht erhielt]."¹¹ Particularly Drobisch, a mathematician-turned-philosopher with a particular interest in philosophical foundations of statistics, must have had a following among science students. And of course, the astrophysicist Zöllner had for some years been attracting mathematics and science students to his lecture courses on psychological and philosophical topics.¹²

One particular connection between Wundt and mathematics in his early years in Leipzig indicates another path by which mathematics students in particular may have come to experimental psychology.

⁸ Bird T. Baldwin, ed., "In memory of Wilhelm Wundt, *Psychological review*, 28 (1921), 153-188: 171.

⁹ G. Stanley Hall, *Founders of modern psychology* (NY: D. Appleton, 1912), 311.

¹⁰ Wundt, *Erlebtes und Erkanntes*, 155. His first reaction to the German version of Hall's book was Wundt, "Eine Berichtigung," *Literarisches Zentralblatt für Deutschland*, Nr. 48 (1915), column 1080.

¹¹ Wundt, *Erlebtes und Erkanntes*, 295-296.

¹² Jürgen Hamel, "Karl Friedrich Zöllners Tätigkeit als Hochschullehrer an der Universität Leipzig: Ein Beitrag zur Geschichte der Institutionalisierung der Astrophysik," *NTM: Schriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin*, 20 (1983), 29-33. A compilation of enrollment numbers for Zöllner's lectures, compiled by a school group [astronomische Schülerschaft] in Leipzig and kindly made available to me by their teacher, G. Münzel, shows that a plurality of those enrolled in Zöllner's philosophical lectures were students of mathematics.

Beginning a cycle of administrative service which culminated in the university rectorship in 1889/90, Wundt became dean [Dekan] of the Philosophical Faculty in winter-semester 1881-82, and his friend Friedrich Zarncke was rector, the highest faculty officer. That same semester, Wundt's name first appeared among the listings for university institutes, as one of the curators, with Felix Klein, of the collection of mathematical instruments and materials called the Czermak'sches Spectatorium.

Wundt remained a curator of the Spectatorium, even after the Institute for Experimental Psychology was established, until Klein moved to Göttingen in 1886 and his successor Sophus Lie reorganized the collection as part of the Mathematical Institute. The biographical and autobiographical material on Wundt never mentions the Spectatorium, but given his interest in scientific instruments, it is possible that this formal connection put Wundt in contact with some of the mathematics students who took doctorates with him in the 1880s. Wundt's connection with mathematics students in particular was complemented by a second, more compelling connection between Wundt and students of both science and mathematics at Leipzig.

By and large, university students who studied mathematics and natural sciences at that time planned to teach those subjects in the *Gymnasien* (the Classical high schools) and the *Realgymnasien* (the modern high schools which featured science and modern languages). Philosophy (with emphasis on logic, ethics and psychology) was a required field in the state teacher's exams [Staatsexamen], so many students encountered Wundt during preparation for these exams. Additionally, some saw him during the examination itself, because Wundt was one of the examiners in philosophy.

Wundt served as an examiner until 1910; however, during the 1880s he also chaired the examination commission for teacher candidates in mathematics and natural sciences.¹³ Many were undoubtedly pleased to encounter, instead of a dry, philologically oriented philosopher, a man educated in medicine and accomplished in experimental science, a man who was developing a "scientific approach" to philosophy. It is not difficult to see how Wundt's work found an enthusiastic reception among mathematics and science students during his first years at Leipzig and why some of them chose to do doctoral work with him following their state exams.

¹³ Wundt's examination seats are listed in the *Personalverzeichnis* of Leipzig University.

An institute for experimental psychology was a natural, if not necessary, development. German universities were establishing and enlarging institutes in the scientific fields at a fast tempo at the time. Wundt's connections to the mathematics and science students explain some of the otherwise curious statements in Wundt's applications for support for his laboratory.

3. Formal applications for state support for an institute.

Such applications had to address the concerns of the administrative authority, in Wundt's case the Royal Saxon Ministry of Religion and Public Education [das Königliche Sächsische Ministerium des Kultus und öffentlichen Unterrichts] in Dresden. As in other German states, a single ministry managed both religious and educational affairs for Saxony. In Prussia medical affairs also were included under a similar ministry.

Wundt first tried to get regular funding for his laboratory in 1879, when advanced students actually began working with the equipment in his storage room. The Ministry, however, had already been giving some support to his work in experimental psychology before that. Wundt began receiving an extra 600 marks annually in 1876 as a personal *Gratifikation* for his experimental work.¹⁴ And of course he got his storage room near his lecture hall. In 1879, the 600 mark *Gratifikation* was apparently converted to a 900-mark raise, as his salary went from 1500 Thaler to 5400 marks.¹⁵ Heartened by the raise, Wundt attempted to get his laboratory into the regular budget, i. e. to have an institute with status apart from his personal research and demonstrations for his lectures. By then he had a few students ready to do advanced research.

Wundt's first applications did not actually use the word "institute." In March of 1879, he simply asked for an annual budget of 600 marks to improve his collection of demonstration apparatus and make it available for an advanced course in experimental psychology. Wundt declared that he had always intended to provide such "exercises" [Übungen] as soon as he was convinced of his teaching "effectiveness" [Wirksamkeit] in the university. The "theoretical exercises" (the reading seminar on

¹⁴ Dorothea Fensch, *op. cit.*, 63. Source: KM to Universitätsrentamt, 17 January 1876, Staatsarchiv Dresden, *ibid.*, fol. 2.

¹⁵ Dorothea Fensch, *ibid.*, 63. Source: KM to Universitätsrentamt, 1 January 1879, Staatsarchiv Dresden, *ibid.*, fol. 9.

psychology) enjoyed such "enthusiastic participation" [eifrige Beteiligung] that the instructor could not hope to meet anticipated demand for "practical exercises" solely from his own resources. He therefore needed the 600 marks "for the building and maintenance of psychological apparatus for students' exercises and as teaching aids for the lectures on psychology [für die Herstellung und Erhaltung eines psychophysischen Apparats zu Übungen der Studierenden und als Lehrmittel zu den Vorlesungen über Psychologie]." ¹⁶ The emphasis on instruction rather than on personal research is of course natural in such an application for funding.

The Ministry declined his request for a regular budget for instruments. ¹⁷ Wundt's plan for an official institute had to wait, but he proceeded with the unofficial institute, and advanced students started to work in his storage room by the fall. In spite of his stated doubts about such an arrangement, he financed the work out of his own pocket and from special laboratory fees paid by the participants.

Three years after the first attempt failed, Wundt applied again, this time not just for money for apparatus, but specifically for the establishment of a "seminar for experimental psychology." At this point Wundt had been at Leipzig for seven years. He was half-way through his one-year term as dean of the Philosophical Faculty. He also was associated with an institute, the Czermak'sches Spectorium. Wundt had learned some of the ropes of university administration and realized that regular state support depended upon the Ministry's interest in producing people with certain types of training.

Wundt's letter to Cultusminister von Gerber, dated April 4, 1882, carefully reviewed academic achievements to date, as well as concrete plans for the future. ¹⁸ Wundt started out in a fashion similar to the earlier application: he had planned a "seminar for experimental psychology [Seminar für experimentelle Psychologie]" since coming to Leipzig in the fall of 1875. But he decided to delay this undertaking until he had proved his effectiveness as a teacher, "a prerequisite for establishing such a seminar [die zu einer solchen Seminarthätigkeit erforderlichen Vorbedingung]." Informal meetings for psychological experiments began in the winter-semester 1879/80 and "a seminar devoted to such

¹⁶ Dorothea Fensch, *ibid.*, 63. Source: Wundt to KM, 24 March 1879, Staatsarchiv Dresden, *ibid.*, fol. 11r.

¹⁷ Dorothea Fensch, *ibid.*, 64. Source: KM to Wundt, 27 March 1879, Staatsarchiv Dresden, *ibid.*, fol. 13. Also a copy at UAL, Phil. Fak. B1/14(raised)37 Bd III (Psychologisches Institut 1879-1917), Bl. 45.

¹⁸ Dorothea Fensch, *ibid.*, 64. Source: Wundt to KM, 4 April 1882, Staatsarchiv Dresden, *ibid.*, fol. 14-17r. Also Wundt's draft of that letter in UAL, *ibid.*, Bl. 46-48, typewritten transcription on Bl. 49-51.

laboratory exercises [eine praktische Seminarthätigkeit der gedachten Art]” was announced in the course catalogue beginning summer-semester 1880. The expenses for materials were paid by the instructor.

The application continued with supporting circumstances. It was much more detailed than the application of 1879 and very explicit on how this research was both attractive and useful to students. The number of students interested in this seminar, Wundt explained, was much larger than expected.

Not only students of philosophy in the narrow sense came (only a few of these are interested in such a subject anyway); rather, more came from physics and mathematics, attracted by the field of psychophysics. The undersigned believes that, precisely for these students of natural science and mathematics, such activity with experimental work is not simply of interest as a binding substance between the professional area and general philosophy; rather, this activity, by the training in direct observation which it involves, can be of use in their special areas.

[Nicht bloss Studierende, welche die Philosophie in engeren Sinne zu ihrem Specialstudium gemacht, und deren Zahl der Natur der Sache nach noch eine sehr beschränkte ist, sondern mehr noch Studierende der Mathematik und Physik haben sich eifrig an den psychophysischen Arbeiten beteiligt. Auch glaubt der Unterzeichnete es wohl aussprechen zu dürfen, dass gerade für die Studierenden der Naturwissenschaften und der Mathematik die Beschäftigung mit experimentellen Arbeiten dieser Art nicht nur Bindemittel zwischen dem Berufsfach und den allgemeinen philosophischen Interessen sein kann, sondern dass diese Beschäftigung noch durch die Übung in direkter Beobachtung, die sie mit sich führt, den speziellen Fachinteressen... zu statten kommen dürfte.]

Products of work in this seminar were “some doctoral dissertations which were well-received by the Philosophical Faculty [einige hierher gehörende Inaugural-Dissertationen, die von der philosophischen Fakultät approbiert worden sind]” and Wundt’s new journal, *Philosophische Studien*, which included doctoral dissertations based on the seminar’s researches.

The rapid development of experimental psychology, Wundt pointed out, was straining the resources of the instructor. Moreover, the present financial arrangement limited research in a field which had much potential. In other words, Wundt made it clear that psychology at Leipzig had outgrown his private resources--it was high time for the Ministry to give official support to an institute.

To give clinching evidence of his success, Wundt noted that his lecture aids had become inadequate. For example, he had to use tables and illustrations originally prepared for a class of 25 students, although there were now over 250 students in his lecture course on general psychology. Here Wundt casually but effectively pointed out the extent of his popularity as a teacher, that self-imposed prerequisite to establishing a seminar for experimental psychology.

Those were the grounds for the request of a 900 mark budget. If this could not enter the regular budget for 1882 and 1883, Wundt concluded, then the request was for a special grant of 900 marks for each year.

Wundt's suggestion that the work of natural scientists would benefit from training in experimental psychology echoes Zöllner's original interest in Wundt's work. There is no ready example, however, of a physical scientist who left Wundt's laboratory and applied improved understanding of perception to research in physics or chemistry, as Zöllner had envisioned. Perhaps Wundt simply mentioned that possibility because it was familiar to the educational ministry. He may also have wanted to make a subtle connection to natural sciences, in hopes of sharing the blessings of institute funding for sciences. In fact, the science and mathematics students who took doctorates in philosophy with Wundt, writing on experimental psychology, tended to teach science and mathematics in the better *Gymnasien*. It is questionable whether these particular people made any use of their training in experimental psychology at all in the actual exercise of their professions. But they did help Wundt build up a sizable group of experimental studies on which to base further research.

Ministerial responses and further applications developed as follows:

April 8, 1882. The Ministry grants 900 marks for 1882, but refuses to instate a regular budget "for the seminar for experimental psychology which you founded and which is under your direction [für das von Ihnen begründete und unter Ihrer Leitung stehende Seminar für experimentelle Psychologie]."¹⁹ The Ministry accepted Wundt's claim that he founded a "seminar for experimental psychology" in 1879, so we might as well accept that year, as Wundt himself did, as the birthyear of the Leipzig Institute for Experimental Psychology, even though the word "Institute" was not used until a few years later.²⁰

December 9, 1882. Wundt asks for 900 marks for the year 1883, as well as permission to use 500 marks left over from 1882 in the coming year.²¹ This frugality is curious, considering that the object

¹⁹ Dorothea Fensch, *ibid.*, 65. Source: KM to Wundt, 8 April 1882, Staatsarchiv Dresden, *ibid.*, fol. 18. Also a copy in UAL, *ibid.*, Bl. 52.

²⁰ There has been some controversy on this point. The issue is reviewed, with overwhelming evidence in favor of the date 1879, by Wolfgang G. Bringmann and Gustav A. Ungerer, "The foundation of the Institute for Experimental Psychology at Leipzig University," *Psychological research*, 42 (1980), 5-18.

²¹ Dorothea Fensch, *op. cit.*, 66. Source: Wundt to KM, 9 December 1882, Staatsarchiv Dresden, *op. cit.*, fol. 20-21.

was to make a case for funding. Perhaps Wundt wanted to give the impression of careful spending, since he only had a half-year to use that year's budget.

December 12, 1882. The Ministry grants 900 marks for 1883 and also permission to spend in that year any money left over from 1882.²²

March 17, 1883. Wundt drops the term "Seminar" and refers to "Institute" from here on. Since it is time to plan the budget for the next academic year, and since the Ministry has already supported the Institute for two years running, Wundt asks once again for establishment of a regular, annual budget of 900 marks. He refers to the grounds given in his long application of April 4, 1882, and notes that the Institute has since then produced more doctoral dissertations based on psychological research and that the *Philosophische Studien* are now in the fourth issue.²³

March 20, 1883. The Ministry acknowledges the request and promises to give it consideration while preparing the budget. It still refers to "Seminar" rather than "Institute."²⁴

4. Wundt's Breslau *Berufung* clinches establishment of the Leipzig Institute.

June 6, 1883, with more justice than any other single date, marks the final, *formal* establishment of the Institute for Experimental Psychology at Leipzig. On that date the Ministry issued a letter detailing Wundt's rewards for turning down the offer of a professorship at Breslau.²⁵ Wundt would later carefully coach his students to take full advantage of such job offers to negotiate better terms for remaining at a university. For agreeing to stay at Leipzig Wundt received:

- (1) A raise in annual salary, as of July 1, 1883, from 5400 to 7500 marks.
- (2) A grant of 1200 marks for his seminar for the next year.
- (3) Additional space for the seminar, as well as remodelling and appropriate fixtures.
- (4) Entry of the "Seminar für experimentelle Psychologie" into the university catalogue.

²² KM to Wundt, 12 December 1882, UAL, *ibid.*, Bl. 53.

²³ Wundt to KM, 17 March 1883, UAL, *ibid.*, Bl. 54, 55 (typewritten transcription, 56).

²⁴ KM to Wundt, 20 March 1883, UAL, *ibid.*, Bl. 57.

²⁵ KM to Wundt, 6 June 1883, UAL, *ibid.*, Bl. 58.

In the matter of item four, there was no quibble over the precise name. Although the Ministry actually requested the Academic Senate (technically in control of courses and institutes) to list a "Seminar für experimentelle Psychologie,"²⁶ it probably did so only because it was accustomed to using the term "Institute" for natural sciences and "Seminar" for other fields. The catalogue for winter-semester 1883/84 showed the name Wundt had been using for several months, "Institut für experimentelle Psychologie."

As an addendum to the second item, apparently settled in the negotiations between Wundt and Kultusminister von Gerber, the next university budget officially committed 1200 marks *yearly* to the Institute for Experimental Psychology, as a letter from the Ministry informed Wundt.²⁷ Wundt's raise in salary, item one, needs no comment.

5. Quarters for the Institute for Experimental Psychology.

The third item, space for the Institute, was very significant to Wundt and to experimental psychology. With this one stroke, Wundt expanded his domain from one small storage room into a real, if still modest, institute. This decision cost the university something in immediate outlay and in long-term commitment.

The *Rentamt* (the office combining functions of "buildings and grounds" and university bursar) prepared a detailed description of plans and costs for the Institute.²⁸ The anteroom of Wundt's storage room was divided to produce a darkroom and storage space for equipment (a and b on Figure 3.1). A nearby classroom (No. 3) was divided to produce two workrooms (labelled c and d). The new Institute therefore consisted of three workrooms: Wundt's original storage space of 37 square meters (Auditorium No. 5), the two new workrooms of 17 and 37 square meters, and a much smaller darkroom and antechamber for equipment storage. Wundt's office [Sprechzimmer] and the large auditorium where he lectured (Auditorium No. 4 on the sketch) were both conveniently close to the research space.²⁹

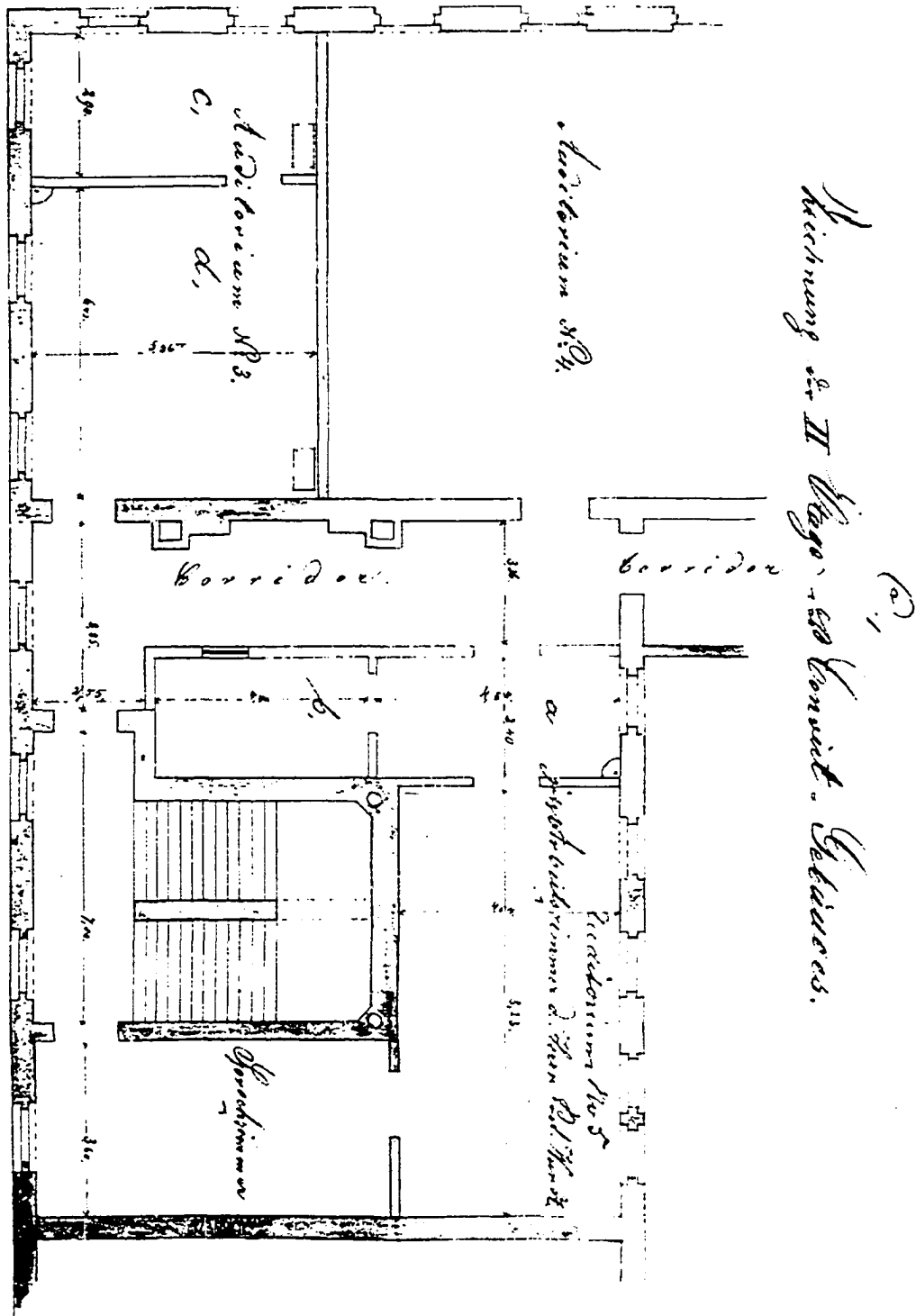
²⁶ KM to Akademischen Senat der U. Leipzig, 6 June 1883, UAL, RA 979 (Universitäts-Rentamt, Psychologisches Institut 1882), Bl. 5.

²⁷ KM to Wundt, 1 April 1884, UAL, Phil Fak B1/14(raised)37 Bd III (Psychologisches Institut 1879-1917), Bl. 59.

²⁸ Universitäts-Rentamt to KM, 31 July 1883, UAL, RA 979 (Universitäts-Rentamt, Psychologisches Institut, 1882), Bl. 7-13.

²⁹ Wundt himself remarked on this advantageous feature of the first Institute, *Erlebtes und Erkanntes*, 291.

FIGURE 3.1: Sketch of the Leipzig Institute for Exp. Psych, 1883. 75



UAL, RA 979 (Universitäts-Rentamt, Psychologisches Institut 1882), Bl. 5.

The *Rentamt* also described the redecorating of the Institute's rooms. They were provided with winter windows, jalousies, a cleaning and fresh paint, gas and electric connections, and furniture: two cabinets, five tables, and twelve chairs. Total cost: 1614 marks, detailed down to the last nail. The single most expensive entry in the list was 500 running meters of electric wire costing 150 marks. These quarters and furnishings heralded the establishment of what William James had a few years earlier called the "new prism, pendulum, and galvanometer philosophers" and what came to be known as the "Brass Age of psychology."³⁰ The Institute was ready for use by the beginning of winter-semester 1883/84.

Dorothea Fensch remarked that Wundt had literally to fight for every table, chair and cabinet. ["Ja, Wundt hat buchstäblich um jeden einzelnen Tisch, Stuhl oder Schrank gerungen."]³¹ Indeed Wundt's attention to detail was uncanny to the point of pettiness. Yet that is precisely how he managed to put together a great institute—little by solid little. With the difficult battles of the beginning behind him, Wundt began to make gains more easily.

The Institute expanded in the summer of 1889 by taking over two rooms in an adjoining building (the wing of the *Beguinhaus* in Figure 3.2) which were vacated when the department of pharmacology moved to the medical area in the *Liebigstrasse*.³² This expansion gave the Institute a total of five work-rooms, plus the darkroom.

There were more expansions to come. When Wundt was rector of the university in 1889-90, plans were being drawn up to rebuild a substantial part of the university. The main buildings, would be enlarged, and the *Convict*, the first home of the Institute, had to be razed. The Institute for Experimental Psychology would move into the remodelled university, but for a few years it would need temporary quarters.

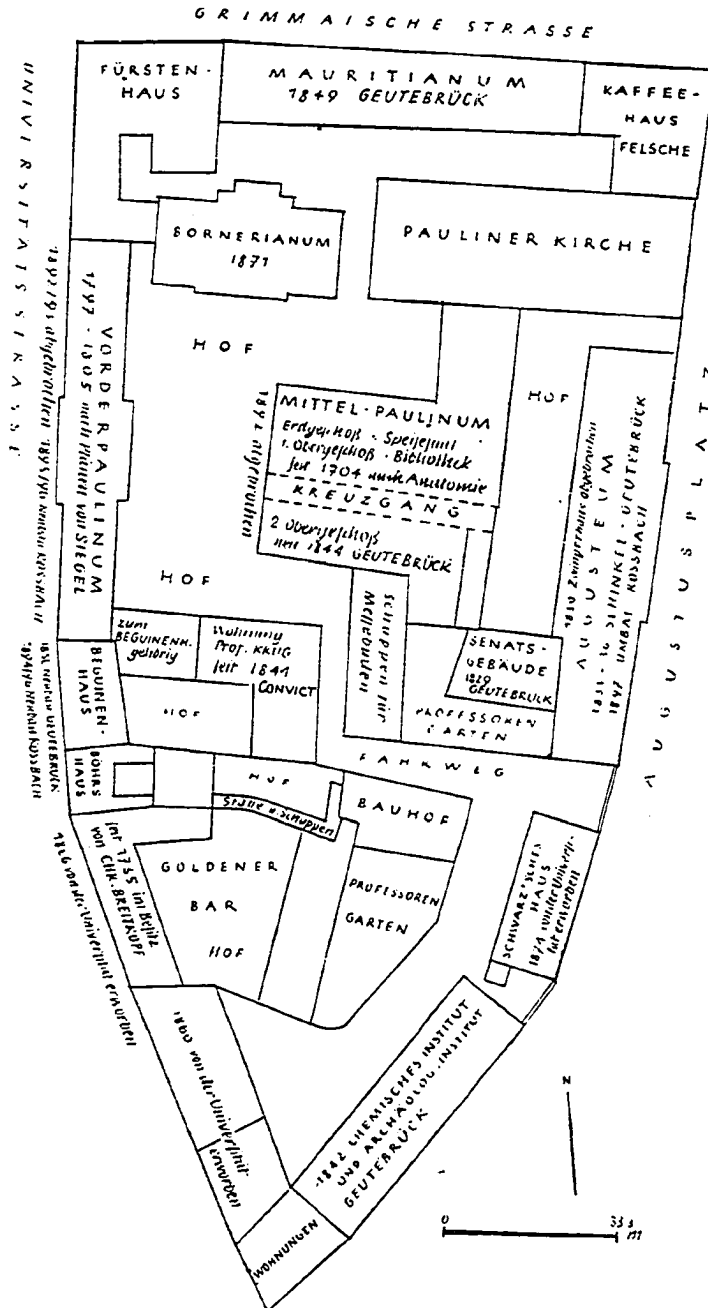
³⁰ William James, "Review of Wundt's *Principles of physiological psychology*," *North American review*, 31 (1875), 195-201; reprinted in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 115). Robert C. Davis, "Exhibit review: The Brass Age of psychology," *Technology and culture*, 11 (1970), 604-612.

³¹ Dorothea Fensch, *op. cit.*, 62.

³² Wundt, "Psychophysik und experimentelle Psychologie," in *Die deutsche Universitäten (für die Universitätsausstellung in Chicago 1893, unter Mitwirkung zahlreicher Universitätslehrer)*, ed. W. Lexis (Berlin: A. Asher, 1893), 452.

FIGURE 3.2

Sketch of Leipzig University, ca. 1883.



Renate Drucker, "Die Universitätsbauten 1650-1945," in Leipziger Universitätsbauten: Die Neubauten der Karl-Marx-Universität seit 1945 und die Geschichte der Universitätsgebäude, ed. Heinz Füssler (Leipzig: VEB Bibliographisches Institut, 1961), 183.

Shortly after his term as rector ended, Wundt wrote a memo describing the Institute and the space required for its work.³³ The number of participants, he wrote, had by summer-semester 1889 reached the desired maximum: eighteen, plus the Institute Assistant, the *Famulus* (student assistant) "who functions as a second assistant," and of course Wundt himself. The nature of the research permitted only one project in any room at a time, and the Institute was fully occupied from early until late each day. A research group typically consisted of three persons, so the Institute needed at least one more workroom, six in all for students. In addition, Wundt requested a workroom for the Institute Assistant and one for himself, so that his office [Sprechzimmer] could be cleared of apparatus. That would make a total of eight workrooms, plus the darkroom. The new quarters had to be free of street noise, preferably facing the inner courtyard. At least some of the rooms had to have southern exposure to allow the use of direct sunlight. Wundt recommended that the Institute be located on the third floor, as the present one was. He also reminded the administrators that the auditorium for the psychology lectures would need a storage room for demonstration apparatus. Wundt concluded his Institute's requirements by asking that the interim quarters fulfill those same specifications and so allow the work of the Institute to continue.

Suitable temporary quarters were found--an entire floor of Grimmaische Steinweg 12, a building called *Trierianium*. Again the Institute profited by the relocation of a department (this time gynaecology) to the new medical area. The Institute remained at that address from fall 1892 to fall 1896, four of the most decisive years of Leipzig psychology. It expanded from five workrooms to eleven, more than the eight Wundt had requested; the largest room served as the library of the Institute. The move into grand quarters in the remodelled university building will be discussed in Chapter Eight. The previous chapter told how Wundt developed his technology, the present one how he acquired his capital; there remains a discussion of his acquisition of labor, i.e., the people who staffed the Institute.

B. Personnel

1. Student helpers.

³³ Wundt to KM (draft only), December 1890, UAL, Phil Fak B1/14(raised)37 Bd III (Psychologisches Institut 1879-1917), Bl. 27-30.

Before Wundt had an institute or even a storage room in Leipzig, he sought out a student to aid him in his effort to promote experimental psychology. The student assistant, or *Famulus*, helped the professor get to lecture with any materials needed and generally assured that the lecture hall was prepared for class. Since Wundt used demonstration apparatus in his psychology lectures, his *Famulus* also gained familiarity with his apparatus. The role of *Famulus* expanded as the storage room developed into the Institute. In payment for his help with the courses, the *Famulus* did not have to pay the course enrollment fees. In fact, he received a small sum from each student enrolled. Wundt's courses often had enrollments in the hundreds, so these fees could amount to a considerable wage. It appears that Wundt usually chose talented, sometimes older, students who were in need of such financial support.³⁴

Shortly after he arrived in Leipzig, Wundt asked Dr. Hans Vaihinger, as one who was active in the Leipzig Academic Philosophical Club [Akademisch-philosophisches Verein], to recommend a student to be his *Famulus*.³⁵ Wundt had been involved in similar clubs in Heidelberg and Zürich, and, as it turned out, psychology was a major interest of the Academic Philosophical Club at the time. Fechner was a revered honorary member and patron, and Zöllner lavished books upon the club's library, occasionally interesting the members in spiritism, his consuming passion in those days.

This active organization gave Wundt contact with Leipzig's young philosophers during his first weeks there, but his interest in the club was short-lived.

It is possible that Wundt's impressions of philosophy students in the club made him all the more interested in students of science and mathematics. In any case, Max Heinze became the club's sponsoring professor, and according to the minutes, Wundt attended meetings only twice. Shortly after requesting Vaihinger's advice, Wundt came to hear him lecture to the club on epistemology. The minutes for that meeting list Wundt, Heinze, Richard Avenarius, and a certain Dr. Wolff as discussants.³⁶ A half-year later Wundt gave a lecture to the club on the concept of infinity in cosmology.³⁷ In 1880 he agreed

³⁴ This is based on the memory of one such *Famulus*: "F. Kiesow," in *A history of psychology in autobiography*, 1 ed. Carl Murchison (Worcester, MA: Clark U. Press, 1930), 163-190; 169.

³⁵ Wundt to Hans Vaihinger, 22 October 1875, UAL, Wundt Nachlass, Nr. 904.

³⁶ *Protokollbuch des Akademisch-Philosophischen Vereins zu Leipzig*, Universitätsbibliothek der Karl-Marx-Universität Leipzig, Abteilung für Handschriften und Inkunabeln, MS01304, entry for 1 November 1875.

³⁷ *Ibid.*, entry for 26 June 1876.

to give the lecture for the club's Kant celebration, but then he cancelled, complaining of overwork. By that time his interaction with the club was limited to the donation of an occasional book to their collection. Later, around the turn of the century, some of Wundt's psychology students were very active in the club, but it was never again as preoccupied with psychology as it was when Fechner and Zöllner were still alive and Wundt had just arrived in Leipzig.

Since there is no record of Wundt's *Famulus* until his Institute appeared in the catalogue in 1883, it cannot be determined whether his first student assistants came to him by way of Vaibinger and the Academic Philosophical Club. It is possible that they came instead through Wundt's contact with students preparing for teacher's examinations in mathematics and natural science. When Wundt's Institute first appeared in the catalogue for winter-semester 1883/84, *stud. math.* Gustav Lorenz was listed as *Famulus*. G. Lorenz got his doctorate with Wundt in 1885. In summer-semester 1885, Carl Lorenz (a relative?) took his place. A mathematics student like the other Lorenz, he was *Famulus* until winter-semester 1887/88. He wrote a dissertation on musical tone intervals in 1890,³⁸ a study which precipitated a bitter controversy between Wundt and his leading competitor in German psychology, Carl Stumpf. (See Chapter 7.)

2. The first Institute Assistants.

When the Institute was formally established in 1883, the *Famulus* had certain duties there, and the building custodian picked up extra cash by acting as "institute servant." Soon, however, activity in the Institute outgrew this informal arrangement. As Wundt remembered, his American student James McKeen Cattell good-naturedly prodded him into taking an assistant:

In the early years I did without an assistant altogether. Even though there was an institute servant, whose duties I entrusted to a university custodian, it was an inadequate arrangement. One day Cattell came up to me and proclaimed, with typical American determination: Herr Professor, you need an assistant, and I will be your assistant!

[In den ersten Jahren entbehrte ich eines solchen [Assistenten] überhaupt, und selbst mit einem Institutsdiener, mit dessen Pflichten einer der Universitätsaufwärter betraut wurde, war es nur kümmerlich bestellt. Da trat eines Tages Cattell an mich heran und erklärte mit bekannter amerikanischer Entschlossenheit: Herr Professor, Sie bedürfen eines Assistenten,

³⁸ The *Personalverzeichnisse* list the Institute staff for every semester. Wundt's doctoral students and the titles of their dissertations are compiled in Anneros Metge, "Doktoranden Wilhelm Wundts," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig. Gesellschafts- und sprachwissenschaftliche Reihe*, 29 (1980), 161-166.

und ich werde Ihr Assistent sein!]³⁹

Cattell was Institute Assistant for the academic year 1885/86; then he went back to the States, Wundtian doctorate in hand, to pioneer laboratory psychology there.

An administrative document gives a picture of the internal organization of the Institute at this time, as well as the flavor of the typical Wundtian attention to detail. The building custodian was replaced in September of 1886,⁴⁰ and Wundt and the *Rentmeister* had to clear the air on how some costs were to be covered.⁴¹ The Institute's budget was for equipment only, as Wundt had understood from his negotiations with Cultusminister von Gerber "on the occasion of his application for approval of an institute for experimental psychology at this university [bei Gelegenheit seines Antrags auf Bewilligung eines Instituts für experimentelle Psychologie an hiesiger Universität]." The outgoing custodian had rendered service beyond the call of normal duty (not just the usual maintenance and cleaning, perhaps mechanical help with instruments?), so Wundt had collected two marks from each Institute participant to give to the custodian. However, Wundt considered it to be "compensation for personal service which the custodian was often in the position to render; it should certainly not be considered even as partial payment for maintenance and cleaning work, which the Institute would in any case require [eine Vergütung für persönliche Dienste, -die der Castellian leisten zu müssen sehr oft in die Lage komme, nicht aber solle dieselbe eine, wenn auch teilweise Entschädigung sein für die Aufwärtendienst und Reinigungsarbeiten, welche das Institut jedenfalls bedürfe]." So Wundt asked that the new custodian be instructed to clean and maintain the Institute as if it were any other classroom.

In the meantime the volunteer Institute Assistant, Cattell, had worked out very well. The experienced custodian was gone, so the need for an Institute Assistant was even greater. Wundt hired Ludwig Lange, who had just gotten his doctorate. Lange then was Wundt's first assistant to have that degree, a normal requirement for an institute assistant in German universities. Years later, Lange proudly recalled that he had participated in the "technical and philosophical establishment [technischer und

³⁹ Wundt, *Erlebtes und Erkanntes*, 312.

⁴⁰ The *Personalverzeichnis* lists Hermann Hartmann as the first *Aufwärter* for the Institute for Experimental Psychology, and then Christian Untucht as of winter-semester 1886-87.

⁴¹ Universitätsrentamt to KM, 20 September 1886, UAL, RA 797 (Universitäts-Rentamt, Psychologisches Institut, 1882), Bl. 14-15.

philosophischer Begründung]" of Wundt's Institute by serving as "the first paid assistant [erster remunerierter Institutsassistent]."42

Lange, as the next chapter will explain, intended to continue as assistant, but illness forced him to leave the position. In April 1888, the Ministry approved the salary of 900 marks for that year for Dr.ph. Oswald Külpe as Institute Assistant and an extra 225 marks for services performed in October, November, and December of 1887.⁴³ Külpe actually began as an emergency replacement for the ingenious but unhealthy Lange, but he served several years as Institute Assistant and then achieved independent fame as a philosopher and psychologist. Wundt occasionally hired, at his personal cost, additional "private assistants," and he managed to get budgeting for an official "second assistant" in 1897. (Appendix I charts the personnel of the Institute.)

So by 1887, the Institute for Experimental Psychology was firmly established, in terms of its facilities, personnel and research program, about which more in the next chapter. Between 1887 and 1894 Külpe helped the Institute achieve international fame as a research center. His *Einführungskursus*, a sort of standard introduction to laboratory methods, trained a substantial proportion of the world's early experimental psychologists, as Wundt withdrew somewhat from the laboratory to devote more time to writing philosophy. In response to increased interest in psychology in the early 1890s, the lecture course on general psychology was given every semester, alternately by Wundt and Külpe.⁴⁴ The yearly budget went for materials, particularly to pay for brass instruments which Wundt and his students invented and refined. Until the late 1880s the precision machinist Carl Krille built most of this apparatus. After Krille died, Emil Zimmermann's precision mechanics firm, founded 1887, began building instruments for the Institute and reproducing Leipzig equipment to market throughout the growing world of experimental psychology.⁴⁵

⁴² Lange to Sophie Mau Wundt, 1 July 1917, UAL, Wundt Nachlass, Nr. 433i. Lange recalled that he was assistant from 1885 to 1887, but that must have been a lapse of memory.

⁴³ KM to Wundt, 20 April 1888, UAL, Phil. Fak., etc., Bl. 1.

⁴⁴ "F. Kiesow," in *A history of psychology in autobiography*. 1 ed. Carl Murchison (Worcester, Mass.: Clark U. Press, 1930), 163-190; 168.

⁴⁵ Wundt, "Das Institut für experimentelle Psychologie," in *Festschriften zur Feier des 500 jährigen Bestehens der Universität Leipzig* (Leipzig: Rektor u. Senat der Universität, 1909), vol. 4, 130. See also the published facsimile of the catalogue of Wundt's house mechanic: *E. Zimmermann, Leipzig. XVIII. Preis-Liste über psychologische und physiologische Apparate, 1903* (Faksimilenachdruck 1983: FIM-Psychologie Modellversuch, Universität Erlangen-Nürnberg und Institut für Geschichte der Neueren Psychologie, Universität Passau, in Zusammenarbeit mit den Sonderausstellungen des Deutschen Museums München).

C. Wundt's journal of experimental psychology, *Philosophische Studien*.

1. The context of a new specialized journal: doctoral dissertations.

The social context of early experimental psychology is illuminated in the founding of Wundt's journal. The Institute and the journal were nearly simultaneous efforts by Wundt. Both were designed to promote his new branch of learning by attracting doctoral students and serving their needs. The large number of Leipzig doctoral dissertations in experimental psychology took that new discipline to an important point in its establishment within the German academic system. There were others involved in the work of the Institute, but the doctoral students were always a central concern, since, as Wundt's applications for funding repeatedly indicated, they legitimized the Institute's existence in the university.

One way to see how the work of these students fit into Wundt's master plan is to describe the development of editions of his most important text. The *Grundzüge der physiologischen Psychologie* (first edition, 1873/74) was Wundt's masterpiece, his most influential written contribution to experimental psychology. Each of the six editions sought to encompass all of experimental psychology. It was the indispensable handbook. Wundt's first proposal to his publisher, Rudolph Engelmann, specified five sections for the book: (1) physiological characteristics of the nervous system, (2) doctrine of sensation and apperception, (3) doctrine of organic movements, (4) criticism of psychological doctrines, and (5) a general theory of psychophysical occurrences. In the first two editions, the last two parts got the short shrift. Whereas the sections on physiology made up more than half the pages, the philosophical arguments were barely developed at all. The second and third parts were, as Wundt described them, "the empirical material of physiological psychology proper."⁴⁶ To simplify, all six editions of *Grundzüge* had essentially three divisions: a long review of physiological bases of sensory perception, followed by psychology proper of the different senses and mental functions, and ending with general philosophical discussions. It was Wundt's style to make a very thorough survey of the literature available on each particular topic and to emphasize experiments wherever possible.

⁴⁶ Wundt to Rudolph Engelmann, 8 December 1872, translated in S. Feldman, "Wundt's psychology," *American journal of psychology*, 44 (1932), 615-629; 616.

It was to enrich the middle division, with its psychological experiments, that Wundt put his advanced students to work in his storage room. They undertook very methodical and exacting tasks: determination of sensory capacities and limits, reaction-time experiments, the investigation of mental processes such as association of ideas. Much of the theoretical and methodological groundwork had already been laid by Wundt and others. But Wundt was the first to attempt a general and sustained program for experimental investigation of a wide range of sensory perception and mental processes. He was the first to attract a line of doctoral students to this enterprise.

Work by advanced students in the "pre-institute" contributed to the second edition of the *Grundzüge* (two volumes, 1880), which set out a framework for the organization of laboratory work much more clearly than the first edition did. In the second volume, a section on "Apperception and sequence of presentations [Apperception und Verlauf der Vorstellungen]" reported on reaction-time experiments that Wundt carried out with his first group of advanced students. Wundt also announced that one student's research, that of Max Friedrich, would be published soon. He did not specify where that research would appear.⁴⁷ Experiments by Wundt's students and eventually those of other investigators in the growing field of experimental psychology filled the next four editions of *Grundzüge* (1887, 1893, 1902/03, 1908-11), and Wundt was even working on a seventh edition when he died in 1920!⁴⁸

Why were advanced students interested in Wundt's work, and what did he do to attract them and keep them coming to him? Edwin G. Boring's writings on history of psychology feature the *Zeitgeist*, the notion that experimental psychology was an idea whose time had come. There is some truth in that simple formulation. But Wundt also took concrete measures to bring doctoral students to experimental psychology. He provided students with backgrounds in mathematics and physical science the opportunity to exercise their experimental skills in a new branch of philosophy, experimental psychology, under the direction of an experienced physiologist. The "doctorate in psychology" with Wundt was their ticket to jobs in better *Gymnasien*. Max Friedrich, Ernst Tischer, and Martin Trautscholdt--the earliest doctoral students in Wundt's Leipzig laboratory--all became secondary-school teachers, and years later

⁴⁷ Wundt, *Grundzüge der physiologischen Psychologie*, 2nd ed. (Leipzig: Engelmann, 1880), vol. 2, 247-260.

⁴⁸ Wilhelm Wirth to Wundt, 12 June 1920, UAL, Wundt Nachlass, Nr. 950.

Wundt proudly noted their professional achievement.⁴⁹

Wundt also helped his doctoral candidates publish their dissertations. Most German universities required, besides the fees for the degree, the typesetting and printing of a minimum number of copies of the dissertation, from 150-300, depending on the university.⁵⁰ Wundt's doctoral students could do this more easily and less expensively because their advisor published his own journal. From its inception this was the idea behind the "first journal of experimental psychology," as historians of psychology refer to Wundt's journal.

2. Wundt's connections to editors and publishers.

Starting a journal was no easy thing, particularly for a professor with relatively low income. Wundt, however, had certain advantages. He was an accomplished textbook writer when he arrived in Leipzig, having published five textbooks on physiology or psychology, some already in further editions and translations.⁵¹ He had already worked closely with editors of journals, as a reviewer of physiological and, more recently, psychological and philosophical literature. Wundt also contributed to three new philosophical journals that were specifically interested in psychology:⁵² the British journal *Mind, a quarterly review of psychology and philosophy* (founded by Alexander Bain and editor J. Croom Robertson in 1876), *Vierteljahrsschrift für wissenschaftliche Philosophie* (founded by Richard Avenarius in 1877), and the French journal, *Revue philosophique de la France et de l'étranger* (founded 1876 by Théodule Ribot).⁵³

⁴⁹ Wundt, "Das Institut für experimentelle Psychologie," in *Festschriften zur Feier des 500 jährigen Bestehens der Universität Leipzig* (Leipzig: Rektor u. Senat der Universität, 1909), vol. 4, 119.

⁵⁰ See requirements for the various German universities in *Minerva, Jahrbuch der gelehrten Welt*, 2 (1892-1893).

⁵¹ *Beiträge zur Theorie der Sinneswahrnehmung* (Leipzig and Heidelberg: C. F. Winter, 1862); *Vorlesungen über die Menschen- und Thierseele*, 2 vols. (Leipzig: L. Voss, 1863); *Lehrbuch der Physiologie des Menschen* (Erlangen: F. Enke, 1864-65, 1868 [2nd ed.], 1872 [French trans.], 1873 [3rd ed.]); *Handbuch der medicinische Physik* (Erlangen: F. Enke, 1867, 1871 [French trans.]); and of course the *Grundzüge* shortly before coming to Leipzig. This listing does not count books that were more of the nature of a monograph.

⁵² This omits earlier journals that published on psychology which were short-lived and very limited in scope. A significant one that lasted was *Zeitschrift für Völkerpsychologie und Sprachwissenschaften*, begun in 1859 by Moritz Lazarus and Hajim Steinthal. See Donald V. Osier and Robert H. Wozniak, *A century of serial publications in psychology 1850-1950. an international bibliography* (Millwood, NY: Kraus, 1984).

⁵³ Wundt published in the latter only once: Wundt, "Sur la theorie des signes locaux," *Revue philosophique de la France et de l'étranger*, 6 (1878), 217-231. See also: Wundt, "La mesure des sensations. Réponse à propos du logarithme des sensations à Mr. Emile Aiglave," *Revue scientifique de la France et de l'étranger*, 2. serie, 8 (1875), 1917-1918. This was part of discussions of psychophysics that involved Delboeuf and others.

In 1875, while Wundt was still in Zürich, he received a letter from the British philosopher J. Croom Robertson. Robertson reminisced about their acquaintance in Heidelberg a decade earlier, when he had given Wundt a copy of Alexander Bain's *Senses and intellect*.⁵⁴ Robertson informed Wundt that he had become Professor of Philosophy of Mind and Logic at University College, London, and that he was planning to edit a "new psychological and philosophical review." Although Robertson did not say so, the journal in fact had financial backing from Bain.⁵⁵ Wundt's *Grundzüge* was scheduled for review in the first issue, and Robertson hoped that Wundt would contribute original articles and suggest other Germans who could write for the journal.⁵⁶ Eventually, Wundt published two articles which appeared in the first two volumes of *Mind*,⁵⁷ but the difficulties of translation and distance prevented sustained involvement with a foreign publication. Besides, a Leipzig colleague soon started up a journal with which Wundt could expect to work very closely.

Richard Avenarius was *Privatdozent* in Leipzig until 1877, when he took Wundt's former chair in Zürich (held in the meantime by Wilhelm Windelband). That same year Avenarius began *Vierteljahrsschrift für wissenschaftliche Philosophie*. Heinze and Wundt supported Avenarius by serving as his co-editors, and Wundt began to publish most of his articles and reviews in the journal. That was a satisfactory arrangement, until doctoral dissertations started issuing from Wundt's storage-room-cum-laboratory.

Wundt's plans for his own journal were apparently stimulated by the suggestions of the young psychiatrist, Emil Kraepelin. We will have more to say about his involvement with Leipzig psychology later on. As far as the journal is concerned, he and Wundt apparently began discussing it soon after advanced students began doing experiments in psychology. Within a year of that time, on August 4, 1880, Wundt wrote to Kraepelin:

⁵⁴ Diamond has pointed out the probability that Wundt benefited from his "reading of Bain's *Senses and Intellect* (1864), the first psychology book to open with a chapter about the nervous system." The implication is that this second edition of Bain's text is the model for Wundt's *Grundzüge*. Solomon Diamond, "Wundt before Leipzig," in *Wilhelm Wundt and the making of a scientific psychology* ed. Robert W. Rieber (NY: Plenum, 1980), 3-70; 59.

⁵⁵ E.B. Titchener's note: "The 'Mind' Association," *American journal of psychology*, 12 (1901), 401.

⁵⁶ J. Croom Robertson to Wundt, 30 January 1875, UAL, Wundt Nachlass, Nr. 1403.

⁵⁷ Wundt, "Central innervation and consciousness," *Mind*, 1 (1876), 161-178; and "Philosophy in Germany," *ibid.*, 2 (1877), 403-518.

Your comment about a journal of psychology, which you regard as desirable, has interested me very much, especially since I have had similar ideas.... I currently have a number of studies of time sense...for which I do not yet have a place of publication.... The best physiological journals pursue other interests as a rule, and a philosophical journal... does not have the necessary space for such topics.... If the project should become reality in any form, I would like to count on your collaboration.

Wundt gave more thought to the idea (October 14, 1880):

The plan of a psychological journal, which you suggested, has come closer to realization. After due deliberation, I think it would be best to extend the scope of the journal to the whole field of psychology and related areas.... I also think it would be best if the journal would initially print only original research.

Soon there were discussions with a publisher (December 17, 1880):

The individual issues are due to appear in an informal order...and the [frequency of] publication is to depend on available material. The publisher has declared himself willing to provide an honorarium of 40 marks and 40 reprints of each article. I would like to bring out articles in the first issue which represent the different fields which the journal is to cover.⁵⁸

Wundt was still investigating the possibilities. He discussed the project with Avenarius, editor of the *Vierteljahrsschrift*. Writing on December 19, 1880, Avenarius responded favorably to Wundt's suggestion that *Vierteljahrsschrift* publish doctoral dissertations from the Leipzig psychology laboratory, although he saw a good side and a bad side to Wundt's idea. The *Vierteljahrsschrift* was operating at a deficit, so it would help to get interesting new material without having to pay the authors. By the same token, the doctoral candidates would not have to pay for typesetting their dissertations, only the minimal costs for the 180 reprints needed to meet the university's requirement for publication. There were however problems with the idea: many of the journal's subscribers would get these reprints sent to them anyway by the authors; and a journal such as *Vierteljahrsschrift* might not always be able to publish a dissertation fast enough to meet the scheduling needs of the doctoral candidate.⁵⁹

Wundt agreed that the undertaking would be inappropriate in the *Vierteljahrsschrift* and suggested a supplemental series, "Philosophical and Psychological Studies, edited by Wilhelm Wundt [Philoso-

⁵⁸ Quotations of these letters from Wundt to Emil Kraepelin are from Wolfgang G. Bringmann, Norma J. Bringmann, and Gustav A. Ungerer, "The establishment of Wundt's laboratory: An archival and documentary study," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 146. Brackets contain my addition, for clarification.

⁵⁹ Richard Avenarius to Wundt, 19 December 1880, UAL, Wundt Nachlass, Nr. 1021.

phischen u. Psychologischen Studien, herausgegeben von Wilhelm Wundt].” Avenarius approved of the idea. He suggested an additional line to the title--“Supplementary series to the *Vierteljahrsschrift für wissenschaftliche Philosophie* [zugleich Ergänzungshefte zu der Vjschr. f. w. Ph.]”--to encourage his subscribers to buy the new series (and, of course, to keep his own connection to Wundt’s increasingly popular work in experimental psychology). Since *Vierteljahrsschrift* was barely keeping itself above water financially, Avenarius hoped that the new series would increase interests and sales. The financial arrangement was still uncertain, however. The publisher, O. R. Reisland of Leipzig, expected that the costs of producing the “Studien” would have to be shared with the authors, since long philosophical studies sold relatively poorly. It would still be a worthwhile thing for the doctoral candidates, Avenarius thought, because they would otherwise have to pay full costs of setting and printing their doctoral dissertations.⁶⁰

Wundt kept looking for a better deal, one that would require minimal money up front. Within a half-year he had the arrangement he needed with the Engelmann publishing house in Leipzig.

3. The deal with Wilhelm Engelmann Verlag and the value of a successful academic author.

In a letter to Wundt in June of 1881, Rudolf Engelmann summarized the terms for the new journal. Established writers would get 40 marks per sheet (16 pages quarto) and 12 reprints of their articles. Wundt himself would get six free copies of each issue. Dissertation writers would not be paid, but would get their necessary 180 copies, having only to pay minimal costs of setting the title page and the vita, and of producing the separates. They would not have to pay the major cost of setting the text.

Engelmann made a few general requests. The journal still needed an appropriate title. The journal should also be made attractive to the widest possible reading public: it should appeal to readers from philosophy and the natural sciences, as well as to psychologists. This goal might be accomplished by including short items on discoveries and phenomena, as well as reviews of literature in the field. Engelmann also advised that, since the Avenarius and the Wundt journals would be at least partially competing, Wundt should cut his ties with the other journal. Finally, Engelmann hinted that Wundt

⁶⁰ Richard Avenarius to Wundt, 31 December 1880, UAL, Wundt Nachlass, Nr. 1022.

would do best to publish all his future works with Engelmann Verlag.⁶¹

Wundt did not grant Engelmann all his requests. "Philosophische Studien" was a general title, but the journal certainly did not aim for a general readership.⁶² Wundt also remained coeditor of Avenarius's journal for another decade. Philosophical differences with Avenarius, discussed later, finally prompted Wundt to withdraw, much to Avenarius's dismay.⁶³

Apparently Engelmann's last request was the one that counted most. He was prepared to underwrite a risky new journal, if he had the promise of an exclusive contract for Wundt's forthcoming books. Wundt achieved such good terms for the *Philosophische Studien* because Engelmann had already profited from good sales of two editions of Wundt's *Grundzüge*. Exclusive rights to this prolific and popular author gave Engelmann promise of high sales for years to come. If Wundt had not been such a plum for the publisher, he would have had difficulty getting his specialized journal started at all. He was not, like Bain, an affluent man--not yet. But as an author whom publishers coveted, Wundt was able to use his situation to support publication of doctoral dissertations written under his direction.

Subsequent letters from Engelmann show their agreement in operation, as the first four issues of Wundt's journal appeared.⁶⁴ This first volume, completed in 1883, contained four doctoral dissertations among the articles. As already noted, Wundt referred to these doctoral dissertations and the journal in his applications for state funding for the Institute in 1882 and 1883.

Wundt's journal, so important in the history of psychology, was really more of a liability than an asset to the publisher. Letters from Engelmann Verlag noted fairly poor sales and wavered between patient optimism and complaints that the journal was too specialized. After starting with 1000 copies of the first issue (four issues to a volume, roughly a volume a year), 600 copies of the next issues were printed. In 1890, the level dropped to 450 copies, in order to save costs. By that time sales had

⁶¹ Rudolph Engelmann to Wundt, 6 June 1881, UAL, Wundt Nachlass, Nr. 1681-1.

⁶² Wundt's memoirs explained the choice of title by referring to his occasional philosophical articles and by stating that the title of the journal staked a claim for experimental psychology in the field of philosophy. See also Wolfgang G. Bringmann, Norma J. Bringmann, and Gustav A. Ungerer, "The establishment of Wundt's laboratory: An archival and documentary study," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 123-157; 146.

⁶³ Richard Avenarius to Wundt, 27 December 1891, UAL, Wundt Nachlass, Nr. 1025.

⁶⁴ Rudolph Engelmann to Wundt, 8 November 1882, UAL, Wundt Nachlass, Nr. 1682-2; Rudolph Engelmann to Wundt, 3 February 1884, UAL, Wundt Nachlass, Nr. 1682-3.

steadied at 250-260. The balance sheet showed a consistent loss: production costs [Herstellungsk., fourth column] exceeded gross income [Summe, seventh column] for nearly every issue of the first five volumes (see Figure 3.3).⁶⁵ The separates for dissertation writers and other authors are not included in these figures.

In spite of the journal's costs, Engelmann Verlag profited from the overall arrangement. It published every *new* Wundt title (though not new editions of older works). Wundt's textbooks sold well, and the agreement lasted until the fall of 1912, when Wundt wanted to change to Alfred Kröner Verlag. The Leipzig publisher had a colorful response to Wundt's plan: he did not, he wrote, "want to submit myself to amputation of a leg, even if I could replace it with a gold one [so vermag ich in diesem Falle doch nicht den Entschluss zu fassen, mich der schweren, von Ew. Excellenz gewünschter Amputation zu unterziehen, auch wenn es möglich wäre, mit den Verlust eines Beines durch ein goldenes zu ersetzen]."⁶⁶ Forced to name a price, Engelmann Verlag suggested 200,000 marks, and Kröner finally agreed to pay 100,000 marks for the name "Wundt."⁶⁷ These pre-inflation amounts give an idea of the value of the really successful academic author at that time.

D. Summary of the establishment phase of Wundt's Institute.

The successful founding of the Institute for Experimental Psychology in Leipzig depended upon Wundt's reputation as a prolific academic teacher and author. Leipzig, alone among Germany's great universities, had been interested in attaining him. Then it was willing to spend what was necessary to keep him. At Leipzig Wundt continued to refine the methodology, the apparatus, and the textbooks which characterized the new discipline. There he began the institute and the journal publication which attracted successive generations of specialists to help Wundt carry out his comprehensive program for experimental psychology.

Now that the plant was firmly rooted, it could develop and bear fruit. The next three chapters consider the most characteristic and essential research in the Institute and its role as a model in the

⁶⁵ By this time Rudolph Engelmann had died. E. Reinicke to Wundt, 7 February 1890, UAL, Wundt Nachlass, Nr. 1681-5. The table is part of this letter.

⁶⁶ E. Reinicke to Wundt, 17 October 1912, UAL, Wundt Nachlass, Nr. 1693-2.

⁶⁷ Letters of 1912, UAL, Wundt Nachlass, Nrs. 1693-18 through 1693-28.

Balance Sheet for Philosophische Studien, 1890.

<i>Sand.</i>	<i>Heft.</i>	<i>Anlage</i>	<i>Kostenstellungsk.</i>	<i>Abzahl.</i>	<i>Notw. 1.</i>	<i>Summe.</i>
I.	1.	1000	1075. 13	323	3.-	969.-
	2.	750	756. 15	327	3.-	981.-
	3.	750	893. 87	298	3.-	894.-
	4.	750	981. 24	246	3.-	738.-
				80	12.-	968.-
			<u>3707.09</u>			<u>4542.-</u>
II.	1.	750	1086. 34	271	3.-	813.-
	2.	750	918. 87	255	3.-	765.-
	3.	750	1343. 69	250	2.75	937.50
	4.	750	1072. 62	250	3.-	750.-
				47	12.75	599.25
			<u>4421.52</u>			<u>3864.75</u>
III.	1.	600	1131. 60	244	3.75	915.-
	2.	600	1194. 03	243	3.-	729.-
	3.	600	769. 95	242	3.-	726.-
	4.	600	1097. 69	239	3.75	896.25
				30	13.50	405.-
			<u>4193.27</u>			<u>3671.25</u>
IV.	1.	600	1082. 96	245	3.-	735.-
	2.	600	764. 92	237	3.-	711.-
	3.	600	1074. 82	254	3.-	762.-
	4.	600	904. 70	243	3.-	729.-
				16	12.-	192.-
			<u>3827.40</u>			<u>3129.-</u>
V.	1.	600	1035. 17	241	3.-	723.-
	2.	600	1011. 86	234	3.-	702.-

E. Reinicke to Wundt, 7 February 1890, UAL, Wundt Nachlass, Nr. 1681-5.

international spread of experimental psychology. Later chapters look at competing centers in Germany, as well as some alternative views on the philosophical basis, and proper academic role, of experimental psychology. Although Wundt's leadership of experimental psychology eventually eroded, from 1883 until at least 1900 there was no doubt that he was the leader and Leipzig was the center.

Chapter IV

Institutionalizing experimental psychology:

The model in Leipzig in the 1880s.

To make the “experimental ideal” work for psychology, Wundt needed a specific research program which justified experimental psychology as a separate discipline. He had been making arguments for this since 1862; now he had to get an international community of researchers to join him in the effort. Otherwise, psychology would continue to be only a minor part of philosophy, and psychophysical methods would interest only the physicists and sensory physiologists who occasionally used them. To establish a separate experimental discipline of psychology, Wundt sought to relate a theory of mind (at least a preliminary or heuristic model) to a well-defined, quantitative and easily reproducible experimental methodology. He had such a program in his Leipzig laboratory during the 1880s.

A. The work of the Leipzig Institute: What was at its heart?

What kinds of experiments were carried out in Wundt’s Institute? And what were they intended to prove or discover? Edwin G. Boring gave one survey of the Institute’s publications. He began with the remark that Wundt actually

defined experimental psychology for the time being, because the work of this first laboratory was really the practical demonstration that there could be an experimental psychology.... Practically all the work from the Leipzig laboratory was published in the *Philosophische Studien* (1881-1903) and there is not very much in this journal that did not come either directly from Leipzig, or from Wundt’s students so soon after leaving Leipzig that they still represented the intentions of Wundt.¹

“All the work from the Leipzig laboratory” refers to the five or so doctoral dissertations from Wundt’s Institute each year, as well as to a few research reports by more advanced researchers. Many dissertations which Wundt sponsored were not published in *Philosophische Studien*, but nearly all the experimental studies were.

Following his apt historical remarks, Boring proceeded to classify the work in the Institute in a

¹ Edwin G. Boring, *A history of experimental psychology*, 2nd ed. (NY: Appleton-Century-Crofts, 1950), 339-340. Hereafter Boring.

way that obscures its uniqueness: he draws almost no distinction between Wundt's Institute and the laboratories of contemporary sensory physiologists. Boring classified 109 experimental articles into four categories: (1) more than one-half on sensation and perception, with the proportion increasing toward the end of the series; (2) one-sixth on reaction times, concentrated in the period before 1890; (3) one-tenth on attention and feeling, especially in the 1890s; and (4) somewhat less than one-tenth on association. Dividing the first category further, he found that vision received the lion's share, nearly a quarter of all the experimental studies in the journal. The next most important area of sensation was auditory perception. In the area of tactile sensation, so important in the history of psychophysics (the Weber law, etc.), there were only a few studies. A couple of researchers published on sense of taste, and there were no articles on the sense of smell. A sixth sense, the "time sense," was represented by three different researchers' studies of the perception or estimation of temporal intervals.

Boring strongly identified with the Wundtian tradition, but his own research speciality was psychophysics, studies of sensation and perception which were not primarily concerned with the issues involved in the other three categories. He suggested that reaction-time experiments represented the core of the work of the early Institute but concluded that that line of research ultimately failed when it proved impossible to measure separately the times required by different mental functions. Boring neglected to emphasize how important this "failed program" was to the development of laboratory psychology. The failure was by no means total, as Metge-Meischner, for example, has argued.²

A separate discipline of psychology needed an area of study that it could call its own. When Wundt came to Leipzig, studies of sensation and perception were primarily identified with physiology, and Wundt would change that identification only partially. Research on sensation and perception in the Leipzig Institute, in the large picture, was preliminary or ancillary to investigations of complex central nervous processes. Reaction-time experiments sought to measure those processes directly. Leipzig researchers worked in hot pursuit of the parameters and laws of mental chronometry, and Wundt's theory of mental processes implied that reaction-time experiments could serve as the model for

² Anneros Metge, "The experimental psychological research conducted at Wundt's Institute and its significance in the history of psychology," in *Advances in historiography of psychology*, ed. Georg Eckardt and Lothar Sprung (Berlin, GDR: Deutscher Verlag der Wissenschaften, 1983), 43-49.

investigating many mental phenomena, including attention, association, feeling, and emotion.

B. The research program: Reaction-time studies.

1. Reaction-time studies before the Leipzig Institute.

Chapter Two of this dissertation told how astronomers, trying to gain ever more accurate simultaneous measurements of position and time for a given celestial event, came up against the phenomenon of the personal equation. No matter how careful the observers, they could differ in reporting a given event by as much as a half-second. This dilemma interested Wundt, and his "complication experiment" sought to explain the discrepancies and develop some standard measurement of reaction times. By 1866 Wundt was taking credit for the discovery that the observed time of a reaction was significantly greater than the time required for a nervous impulse to travel from sense organ to the brain plus that required to travel back to the reacting muscle.³ In other words, a good chunk of the time was taken up by *central* nervous processes. For a young physiologist declaring a new scientific psychology, that was a crucial finding. It only remained to discover a way to investigate those central processes experimentally.⁴

At about this time such investigations were made possible by the appearance of an accurate instrument to measure the "speed of thought." The Swiss astronomer Adolph Hirsch (1830-1901) began doing experiments with a chronoscope (a very accurate stop-clock) which had been developed by his precision mechanic, Mathias Hipp (1813-1893).⁵ The Hipp chronoscope (see Figure 4.1) registered time intervals to the one-thousandth second. With minor improvements, it remained a standard piece of apparatus in psychology laboratories for at least fifty years after Hirsch published his reaction-time measurements in the early 1860s.⁶

³ Solomon Diamond, "Wundt before Leipzig," in *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum Press, 1980), 3-70; 49.

⁴ The following discussion is based on the chapter "Reaction time" in Robert S. Woodworth, *Experimental psychology* (NY: Henry Holt, 1938), 298-339.

⁵ A. Hirsch, "Expériences chronoscopiques sur la vitesse des différentes sensations et de la transmission nerveuse," *Bulletin de la société des sciences naturelles, Neuchâtel*, 6 (1861-63), 100-114; A. Hirsch, "Ueber persönliche Gleichung und Correction bei chronographischen Durchgangs-Beobachtungen," *Untersuchungen zur Naturlehre des Menschen und der Thiere*, 9 (1863), 200-208.

⁶ Michael M. Sokal, Audrey B. Davis, and Uta C. Merzbach, "Laboratory instruments in the history of psychology," *Journal of the history of the behavioral sciences*, 12 (1976), 59-64; 61-63.

Hirsch determined the times for some simple reactions, in which the subject signaled, e.g. pressed a telegraph key, upon perceiving a stimulus:

visual stimulus	200 ms (milliseconds)
auditory stimulus	150 ms
electric shock	140 ms

It was of great interest to astronomers that visual perception required more time; astronomical photography was then in its infancy, and precision-timed observations still required eye-ear coordinated reports.

At Utrecht, the physiologist Franciscus Cornelis Donders (1818-1889) proposed a way to measure the time taken by different mental functions. His technique, the "subtraction method," was essentially this: find the time for a simple reaction to stimulus (such as those Hirsch did); run another reaction which is set up in the same way but which involves a more complicated mental process; then subtract the first time from the second to get the "physiological time" required by that additional mental process.⁷

Donders's experiments rely on the assumption that *each* part of the reaction (sensation, perception, discrimination, choice, reaction movement) takes a *specific* amount of time, and that "physiological time" for particular mental processes can be determined if experiments can be devised in which there is first no such process and then that process is simply "inserted." The additional time is the time required by that particular mental process. Donders proposed three reactions which he claimed produced time measurements for "choice" and for "discrimination."

Speech sounds served as stimuli and reactions. These were recorded on a moving drum, from which time differences could be measured. The first reaction, the a-reaction, was the simple response to stimulus. The b-reaction required sensory discrimination and then motor selection in signaling the choice. The c-reaction required sensory discrimination but, according to Donders, no motor selection.

⁷ The first presentation of such experiments was the medical dissertation of Donders's student: J. J. de Jaeger, *De physiologische tijd bij psychische processen* (Utrecht, 1865), trans. as "Reaction time and mental processes," in *Origins of psychometry*, ed. and trans. J. Brozok and M. S. Sibinga (Nieuwkoop, Netherlands: de Graff, 1970). Donders communicated the results more widely in his articles, particularly, "Die Schnelligkeit psychischer Prozesse," *Archiv für Anatomie und Physiologie* (1868), 657-681; trans. "On the speed of mental processes," *Acta psychologica*, 30 (1969), 412-431.

The experiment used five syllables, something like “ka, ke, ki, ko, ku.” For the simple reaction, the a-reaction, the stimulus was always “ki,” and the response was also “ki.” For the “choice reaction,” the b-reaction, the stimulus was any one of the five syllables; the subject responded by speaking the same syllable. The subject had to make a sensory discrimination and then a motor selection in order to produce the correct response. For the c-reaction, the stimulus was again any of the five syllables, but the subject was instructed to respond only when he heard “ki.” Donders thought that this last reaction involved sensory discrimination but no motor selection, no choice. Donders found these average results:

a-reaction	197 ms
b-reaction	285 ms
c-reaction	243 ms

Using the subtraction method, sensory discrimination time (c-a) was 46 ms, and pure choice (b-c) took 42 ms.

Wundt welcomed this quantitative handle on mental processes. The time intervals were very small, considering the crude technology which measured them, but the subtraction method promised to produce time measurements for mental processes. Conscious mental actions had become the focus of Wundtian psychology, and the reaction-time experiment was the *raison d'être* of the Institute when the work began in 1879.

One active participant in the program, James McKeen Cattell, made a point to correct a common assumption and to distinguish psychometry from psychophysics: “We are naturally glad to find it possible to apply methods of measurement directly to consciousness; there is no doubt but that mental processes take up time, and that this time can be determined. The measurements thus obtained are not psychophysical, as those which we have been recently considering, but purely psychological.”⁸ Kurt Danziger has accordingly observed: “The reaction-time studies conducted during the first few years of Wundt’s laboratory constitute the first historical example of a coherent research program, explicitly directed toward psychological issues and involving a number of interlocking studies.”⁹ Whether or not

⁸ James McKeen Cattell, “The psychological laboratory at Leipsic,” *Mind*, 13 (1888), 37-51; 45.

⁹ Kurt Danziger, “Wundt’s theory of behavior and volition,” in *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum Press, 1980), 89-115; 106.

they directly addressed the reaction-time problem, the measurement of times for specific mental processes, the crucial (and controversial) problems in early experimental psychology grew out of reaction-time work in Leipzig; this was the experimental ground upon which Wundt staked his theoretical claims and set his students to work. Innovations and improvements in psychological experimentation by other researchers often originated in a criticism of Wundt's approach.

2. Reaction-time studies in the Leipzig Institute.

Wundt altered the Donders experiment, for practical and theoretical reasons. He accepted the subtraction method but preferred to use the Hipp chronoscope rather than the rotating drum; direct readout was more convenient for repeated series of experiments than time-consuming measurements and conversions of line-lengths on the drum. (See Figure 4.1, a setup for simple auditory reaction.) In addition to this technical change, Wundt's reaction-time experiment incorporated an important conceptual difference.

Wundt's theory of mental processes involved a stricter distinction between choice and discrimination. In the first edition of *Grundzüge*, Wundt expressed doubts about Donders's classification. To him, both the b-reaction and the c-reaction involved choice. In the case of the b-reaction the choice was between different muscular responses; in the c-reaction the choice was to respond or not to respond. In the second edition of *Grundzüge*, published shortly after advanced students began to work in the Leipzig laboratory, Wundt formally introduced his pure discrimination reaction.¹⁰ In such a reaction there were different possible stimuli, and the subject signaled (always using the same muscular movement) as soon as he "recognized or identified" the stimulus given. This d-reaction involved discrimination [Unterscheidung] but not choice [Wahl].

Although the d-reaction would appear to be little more than an interesting thought experiment--there being no external way to know exactly when recognition occurs--this was in fact the actual discrimination experiment used in the early Institute. It may be that Wundt's strict theoretical

¹⁰ Wundt, *Grundzüge der physiologischen Psychologie* (Leipzig: Engelmann, 1874), 744-745; 2nd ed. (Leipzig: Engelmann, 1880), vol. 2, 247-256. Woodward mistakenly describes the Donders discrimination reaction as Wundt's own: William R. Woodward, "Wundt's program for the new psychology: Vicissitudes of experiment, theory, and system," *The problematic science: Psychology in nineteenth-century thought*, ed. William R. Woodward and Mitchell G. Ash (NY: Praeger, 1982), 167-197: 183.

FIGURE 4.1
Reaction-time Apparatus (auditory)

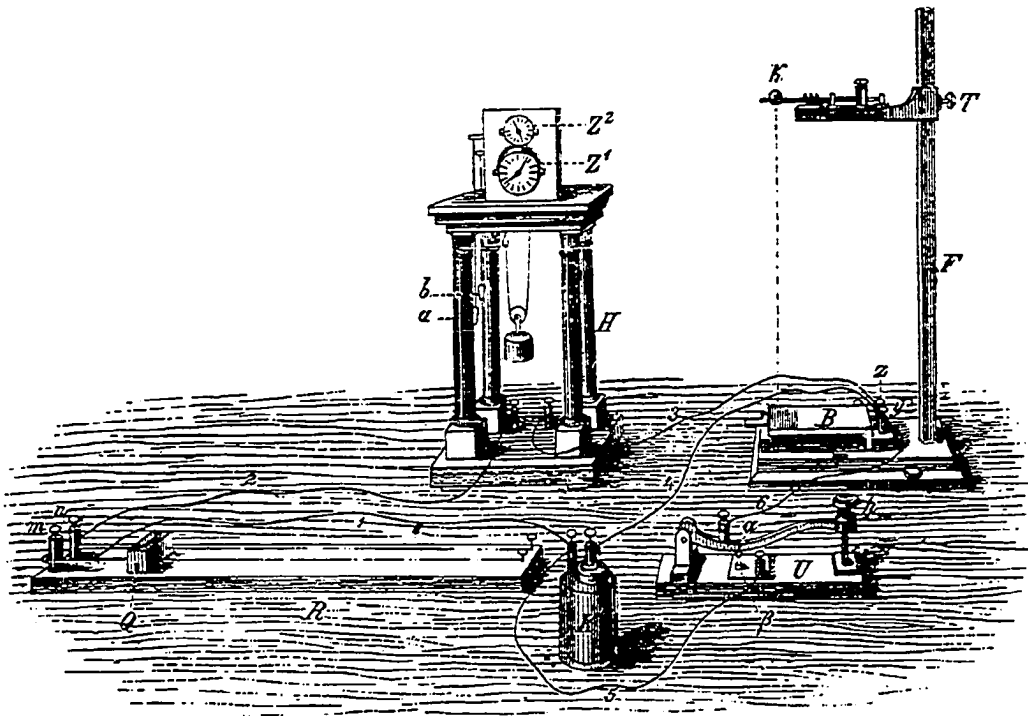


Fig. 175.

Wundt, *Grundzüge der physiologischen Psychologie*, 2nd ed., vol. 2
(Leipzig: Engelmann, 1880), 231.

requirements resulted in more flexibility in experimental controls, but he was, after all, pioneering new territory.

A purely *psychological* experiment, employing the advanced instrumentation of current physical and physiological research, was largely undefined in the 1870s and 1880s. Wundt believed that experiments on purely psychological phenomena were possible and that psychological experiments would necessarily involve subjective elements which physiologists, for example, generally tried to exclude. This was precisely why a special science of experimental psychology, in addition to and distinct from physiology, was needed. Experimental psychology depended upon refined techniques which Wundt variously referred to as self-observation [Selbstbeobachtung], inner observation [innere Beobachtung] and inner experience [innere Erfahrung]. Although Wundt's English-language translators commonly used "introspection" to refer to his experimental methodology, the term has been used too loosely. "Self-observation, controlled by experiment" is perhaps the best description of Wundt's method.

Wundt was no novice at physiological experimentation, so his faith in the d-reaction reveals a strong theoretical commitment. The sharp distinction between discrimination and choice corresponded with Wundt's five-part model for mental reaction. The schema was the centerpiece of the work of the early Institute, and not only of reaction-time studies. Especially in the 1880s, this litany began nearly every paper:

- (1) sensation, the movement of the nerve impulse from the sense organ into the brain;
- (2) perception, the entry of the signal into the field of consciousness [Blickfeld des Bewusstseins];
- (3) apperception, the entry of the signal into the focus of attention [Blickpunkt des Aufmerksamkeits];
- (4) act of will, in which the appropriate response signal is released in the brain;
- (5) response movement, or more precisely, the movement of the response signal from the brain to where it initiates muscular movement.

Wundt contended that steps one and five are purely physiological, whereas the three middle steps are psychophysical, i.e. they involve processes that "have both a physiological and a psychic side."¹¹

¹¹ *Grundzüge der physiologischen Psychologie*, 2nd ed. (Leipzig: Engelmann, 1880), vol. 2, 221.

Every mental reaction involved all five steps, and there was no direct way to measure separate times for the three middle steps. However, well-constructed experiments using the subtraction method could give estimates of "time of apperception" (discrimination time) and "time for an act of will" (choice time). The subjects in these experiments had to be trained in self-observation in order to report these psychic events.

Wundt's first doctoral students in the Institute used the discrimination reaction in the way just described. In one study using visual stimuli, the simple reaction consisted of pressing a key upon perceiving a flash of light. In another reaction, Wundt's d-reaction, one of two different images was suddenly illuminated before the subject: either a white circle on black background or a black circle on white background. The subject pressed the key as soon as he decided which one he was seeing. Initial illumination started the Hipp chronoscope running, and the pressing of the key stopped the dial, giving time elapsed for the entire reaction.

Wundt and two of his doctoral students, Max Friedrich and Ernst Tischer, did the experiments together. One served as the subject, as another initiated the reaction by illuminating the image and the third recorded the times. Then they alternated roles. This was the classical Wundtian experimental setup: subject [Reagent], experimenter [Experimentator] and observer [Beobachter], respectively. Needless to say, all three had to have a clear understanding of what it meant to "recognize" a black or a white circle, and they had to be consistent in their performance of this recognition. In these early experiments, they trained until average reaction time was as short as possible, and mean variation was minimized for each reacting subject.

The d-reaction seemed to give reasonable results in the first several studies.¹² The simple reaction took from 132 to 226 ms, in fair agreement with Donders, and "recognition" added from 50 ms (Friedrich's average time) to 79 ms (Wundt's). With four different colors the recognition time increased, from Tischer's average of 73 ms to Friedrich's 157 ms.

Similar experiments gave choice times. First was the simple choice, to react or not react to the

¹² Numerical results, unless otherwise specified, are from the first communication of the experiments, in the second edition of the *Grundzüge* (1880), vol. 2, Chapters 16 and 17, 219-327.

stimulus, e.g., press the key for the white circle but not if it is the black one that appears. (This was the reaction which Donders had claimed involved no choice.) Reaction time averaged between 368 ms and 455 ms, whereas discrimination without the simple choice averaged from 185 ms to 303 ms for the three subjects. Therefore, extra time taken to make the simple choice ranged between 152 ms and 184 ms for these subjects.

There could also be choice between different movements: press a key with the right hand if the image is white, a different key with the left hand if black. This choice time was, conveniently enough, somewhat longer, averaging between 188 ms to 331 ms more than the time for the simple discrimination reaction.

A summary of the results:

1st Experiment:	simple reaction	132-226 ms
	discrimination, 2 stimuli	50- 79 ms more
	discrimination, 4 stimuli	73-157 ms more
2nd Experiment:	reaction with discrimination,	
	but no choice	185-303 ms
	simple choice	152-184 ms more
	multiple choice	188-331 ms more

Wundt and his students recognized that individual differences and external conditions (distractions, fatigue, etc.) could affect the outcome of a reaction, but at that point they simply considered those factors as topics for further study, once they had established base averages for the different mental functions.

With confidence that they had a way to measure indirectly the time required for two parts of Wundt's five-phase reaction, the Leipzig psychologists undertook to determine the extent to which more complicated tasks called for extra action by the apperception (in recognition) and/or the will (in choice). Max Friedrich's doctoral dissertation, the very first one expressly to treat of experimental psychology, found that time of apperception increased with complexity of stimulus, i.e. it took more time to "recog-

nize" a string of six digits than just one or two, and that practice could shorten discrimination time, but not simple reaction time to any appreciable extent.¹³

Another early doctoral dissertation was Martin Trautscholdt's study of time of association. Association, according to Wundt's theory, was a particular action of the apperception, a successive focussing of attention on different thoughts. The subject in this experiment was instructed to signal the moment an idea, produced by an association with the stimulus, appeared in consciousness. Subtracting this time from "recognition time" for the stimulus itself, it was determined that the association part of apperception added 706 to 874 ms to reaction time.¹⁴

The investigations employing the subtraction method looked promising, but too much depended upon separate measurements of discrimination time, measurements which proved to be very unstable. In the first volume of *Philosophische Studien*, where Friedrich's and Trautscholdt's dissertations appeared, Ernst Tischer's dissertation on discrimination of sounds already showed some difficulties. Auditory stimulus, as Hirsch noted, gave shorter simple reaction times than visual stimulus. Occasionally discrimination time seemed to be zero, that is, the time required simply to react to an acoustical stimulus was equal to the time required to react when the stimulus was "recognized."¹⁵ Likewise, Emil Kraepelin's article on the effects of drugs on these reaction times found that discrimination time was an unreliable concept, particularly when the subject was under the influence of drugs or alcohol.¹⁶ It was becoming apparent that the discrimination reaction required practice and expertise of such a special and fragile nature that it was uncomfortable, to say the least, to base a whole line of research on it.

An ambitious American student added significantly to the discredit of the discrimination reaction. James McKeen Cattell (1860-1944) made considerable improvements to reaction-time measurements; then he essentially abandoned the discrimination reaction. Early in his work at Leipzig, he determined

¹³ Max Friedrich, "Über die Apperceptionsdauer bei einfacher und zusammengesetzten Vorstellungen," *Philosophische Studien*, 1 (1883), 39-78. See Peter J. Behrens, "An edited translation of the first dissertation in experimental psychology by Max Friedrich at Leipzig University in Germany," *Psychological research*, 42 (1980), 19-38; and Peter J. Behrens, "The first dissertation in experimental psychology: Max Friedrich's study of apperception," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 193-209.

¹⁴ *Grundzüge*, 2nd ed. (1880), vol. 2, 279-291; Martin Trautscholdt, "Experimentelle Untersuchungen über die Association der Vorstellungen," *Philosophische Studien*, 1 (1883), 213-250.

¹⁵ Ernst Tischer, "Über die Untersuchungen von Schallstärken," *Philosophische Studien*, 1 (1883), 495-542.

¹⁶ Emil Kraepelin, "Über die Einwirkung einiger medicamentöser Stoffe auf die Dauer einfacher psychischer Vorgänge," *Philosophische Studien*, 1 (1883), 417-462, 573-605.

that the magnetic mechanism on the Hipp chronoscope engaged the time dial faster than it disengaged. The delay in stopping the dial caused overall reaction times to be measured as greater than they should have been. Cattell invented a device to engage and disengage the timer equally, and his improvement became standard on chronoscopes thereafter. Cattell also devised a gravity chronometer [Fallapparat] which improved experiments involving visual stimuli. A gate would drop, starting the Hipp chronoscope running and revealing the visual stimulus (a word, figure, etc.); the reacting subject pressed a key, stopping the chronoscope. Time elapsed was thus registered. This arrangement produced reaction times shorter than the sudden illumination used in Friedrich's experiment, because abrupt change in light level required extra accommodation by the eyes.¹⁷

Since Cattell's improvements lessened measured reaction times, he had problems keeping enough slack for a distinct discrimination time. Another doctoral student who shared Cattell's critical view of the d-reaction was Gustav Berger, Cattell's closest colleague in the Institute and at times his paid personal assistant and translator. Berger's dissertation concentrated on the simple reaction and questioned the methodological status of the choiceless discrimination reaction: the motor response which actually stopped the chronometer did not depend upon perception, something with a physical correlate, but rather upon apperception, a "psychophysical event" which (at least until the electronic devices of the mid-twentieth century) could not be registered independently. There was no sure way to check for false reactions or otherwise be certain when apperception occurred.¹⁸

Cattell and Berger ran out of patience with Wundt's five-phase schema for mental action. In one of his occasional critical outbursts, the bright young American in Leipzig wrote to his parents:

Wundt's laboratory has a reputation greater than it deserves--the work done in it is decidedly amateurish. Work has only been done in two departments--the relations of the internal stimulus to the sensation, and the time of mental process. The latter is my subject--I started working on it at Baltimore before I had read a word written by Wundt--what I did there was decidedly original. I'm quite sure my work is worth more than all done by Wundt and his pupils in this department, and as I have said it is one of the two departments on which they have worked. Mind I do not consider my work of any special importance--I only consider Wundt's of still less. The subject was first taken up by Exner, and Wundt's continuation of it has no originality at all; and being mostly wrong has done more harm than good.¹⁹

¹⁷ Wundt, *Grundzüge*. 5th ed. (1902), vol. 3, 476.

¹⁸ Gustav Oskar Berger, "Über den Einfluss der Reizstärke auf die Dauer einfacher psychischer Vorgänge mit besonderer Rücksicht auf Lichtreize," *Philosophische Studien*, 3 (1886), 38-93.

¹⁹ James McKeen Cattell to parents, 22 January 1885, quoted in *An education in psychology: James McKeen*

Cattell's bragging to his parents doubtlessly involved a certain amount of perfunctory denigration of his teacher, but in fact he had some reason to brag.

Cattell's mechanical ingenuity was supplemented by his keen thinking. He compared Wundt's ideas on the reaction-time experiment to what he knew about other studies and found Wundt's view to be wanting. Exner's emphasis on the effects of attention, or preparation for a reaction, figured into Cattell's reaction studies already in his first semester in the Institute, from November 1883 to March 1884.²⁰

Sigmund Exner (1842-1926), a physiologist in Vienna who had studied in Heidelberg under Helmholtz and Wundt's uncle, Friedrich Arnold, coined the term "reaction-time experiment." He found that for simple reactions, preparation was the only thing which was voluntary; the reaction itself was involuntary, simply a reflex chain set in motion by the perception of the stimulus.²¹ Wundt argued that Exner used incorrect values for the different speeds of nerve impulses in sensory, spinal and motor areas and simply underestimated "psychophysical time"--the time Wundt ascribed to the central nervous processes of perception, apperception, and will.²² Cattell, however, judged that Exner was more correct than Wundt about the overall times and the effects of preparation.

The whole program, reaction-time research as a way of demonstrating and investigating Wundt's schema for mental processes, was about to fall apart. Yet Wundt was ready to accept the results of experimental research, and he was certainly pleased by the improvements in the instruments. He even gave Cattell the honor of being his first Institute Assistant, though Cattell was unpaid and apparently did not have the extensive responsibilities of later assistants for training students. In any case, Cattell's replacement as Institute Assistant came forth with an idea which revitalized Wundt's program and opened up areas for new research, and for new controversies.

Cattell's journal and letters from Germany and England, 1880-1888, ed. Michael M. Sokal (Cambridge, Mass.: MIT Press, 1981), 156.

²⁰ *Ibid.*, 98-105.

²¹ Sigmund Exner, "Experimentelle Untersuchungen der einfachsten psychischen Prozesse," *Pflügers Archiv für die gesamte Physiologie*, 7 (1873), 601-660; 8 (1874), 526-537; 11 (1875), 403-432, 581-602.

²² *Grundzüge* 2nd ed. (1880), vol. 2, 225, fn 4.

3. Ludwig Lange's approach to the reaction-time experiment: muscular vs. sensorial reaction.

Ludwig Lange (1863-1936) was one of the most interesting and most tragic of Wundt's students. The son of the professor of classical philology at Leipzig, he had his early education at the famous Thomasschule. After the *Abitur* in 1882, the military rejected him as "too narrow-chested" [Schmalbrüstigkeit]. So he started university studies, first a semester at Leipzig University, then two semesters in Giessen, then back to Leipzig. He concentrated on mathematics and physics, but he also studied philosophy, attending Wundt's lectures on logic, ethics, history of philosophy and psychology. Lange was another one of those many mathematics students, like Max Friedrich, who were attracted to research in the early Institute.

In 1885, Lange's father became ill, and the sickly son accompanied him that summer as they searched through Italy, the Alps and elsewhere for the right climate and the right physician. Lange's letters to Wundt show him identifying with his father's illness and taking morbid interest in psychological aspects of his own symptoms and of his reactions to the barbaric treatments he endured. For example, to cure sinus problems he took a treatment consisting of electrical burning inside the nose, five to seven times on each of six different days over the course of three weeks. "This had many interesting physiological-psychological consequences," such as simultaneous pains in one side of the jaw and the opposing buttock, and tears flowing out of one eye.

After such gruesome details, Lange's letter went on to tell Wundt of his intention to write a doctoral dissertation in philosophy—a historical-epistemological study of the law of inertia. Wundt agreed to direct the dissertation.²³ Lange's father died in August of 1885, and Wundt took the young man under his wing. Lange finished the dissertation for the doctoral degree in 1886, and his three articles on inertia appeared in Wundt's journal.²⁴

²³ Ludwig Lange to Wundt, 9 June 1885, UAL, Wundt Nachlass, Nr. 433a; 13 June 1885, UAL, Wundt Nachlass, Nr. 433b. Biographical information was collected by a physicist, famous for his early support of Einstein's theory of relativity, who took an interest in this early critical thinker on inertial systems: Max von Laue, "Dr. Ludwig Lange, 1863-1936. (Ein zu Unrecht Vergessener)," *Die Naturwissenschaften*, 35 (1948), 193-203.

²⁴ Ludwig Lange, "Ueber die wissenschaftliche Fassung des Galilei'schen Beharrungsgesetz," *Philosophische Studien*, 2 (1885), 266-297; "Nochmals über das Beharrungsgesetz," *ibid.*, 2 (1885), 539-545; "Die geschichtliche Entwicklung des Bewegungsbegriffes und ihr voraussichtliches Endergebniss," *ibid.*, 3 (1886), 337-419, 643-691.

Although Lange's first writings were not on experimental psychology, Wundt chose him to succeed Cattell as Institute Assistant. Lange was the first paid assistant, also the first to have the doctoral degree already in hand. During 1885-86, as Berger and Cattell pursued Wundt's experimental program with great accuracy, and in the process undermined the theory behind reaction-time studies in the Institute, Lange came up with a way to save Wundt's model. His experiments were reported in the 1887 (third) edition of the *Grundzüge* and appeared in an article in Wundt's journal, "New experiments on the process of the simple reaction to sense impressions."²⁵ This article was the basis for many publications in experimental psychology for the next several years.

Lange claimed that simple reactions were of two very different types: "sensorial" or "muscular," depending upon whether the subject directed attention toward the stimulus or toward the reacting movement. The sensorial reaction was a "complete" reaction, whereas the muscular reaction was "shortened"--as it were, preparation by directed attention could short-circuit apperception and will in Wundt's schema of mental processes. The purely muscular reaction was nothing more than a "brain reflex."

The experiment to show the distinction between the two types of reactions required the subject to assume certain mental attitudes of preparation. For the muscular reaction he was to concentrate on the response movement and not to think at all about the stimulus. The sensorial reaction required more difficult preparation. As Robert Woodworth explains it, the subject had "to avoid altogether all preparatory innervation of the movement, but to direct the whole preparatory tension towards the expected sense impression, with the intention, however, of letting the motor impulse follow immediately on the apprehension of the stimulus, without any unnecessary delay."²⁶ The subject practiced to acquire one or the other extreme of attitude. The muscular attitude was easier to assume, but it also produced many premature and false reactions, which did not occur in the sensorial reaction. The muscular and sensorial reactions were the extremes; in any given, unpracticed reaction, attention lay somewhere between the two attitudes. Lange thus accounted for the problematic findings of Tischer, Kraepelin, Cattell, and

²⁵ Ludwig Lange, "Neue Experimente über den Vorgang der einfachen Reaction auf Sinneseindrücke," *Philosophische Studien*, 4 (1886), 479-510.

²⁶ Robert S. Woodworth, *Experimental psychology* (NY: Henry Holt, 1938), 306.

Berger, and at the same time he opened up a line of reaction-time research on attention.

Lange and two colleagues in Wundt's Institute did simple reactions to acoustic and cutaneous stimuli and found that the muscular reaction took about 125 ms, whereas the sensorial reaction took approximately 100 ms longer. Lange interpreted the muscular reaction as action through prepared reflex (à la Exner) and the sensorial reaction as involving the full five steps of Wundt's schema, including the three psychophysical actions. To continue studies of apperception and will, one had only to make sure that subjects did only sensorial reactions.

Lange himself could not stay to carry out this effort. The manic-depressive tendency which was evident in his letters to Wundt in the summer of 1885 got out of control, and he spent the rest of his rather long life as a mental invalid. Perhaps manic energy even played a role in the experimental innovation which had so pleased Wundt, Lange's substitute father-figure. When the depressive side finally surfaced, Lange was forced to leave the Institute, even though Wundt had intended for him to remain as Assistant. A student who arrived in Leipzig a couple of years later noted that "strenuous objection was made to the new laboratory on the grounds that continued self-observation would drive young persons to insanity."²⁷ Maintaining the "sensorial attitude" while doing discrimination experiments must have been demanding and tedious. The subject had to concentrate on *not* anticipating the response movement, since one naturally tended to drift toward that state of preparation during a series of repeated reactions. Lange's problems had become the stuff of gossip and rumors against Wundt, but Lange clearly had weak physical and mental health before he came into the Institute. Nevertheless, the sad developments must have given Wundt cause to think about pathological consequences of psychological experiments.

But the work continued. The sensorial reaction offered renewed opportunity for investigations and time measurements of conscious mental processes: apperception and acts of will. Exner's notion of willful preparation followed by essentially unconscious reaction by reflex was not the stuff of psychological research, as Wundt had envisioned it anyway. Wundt wanted direct experimentation on conscious mental functions. To a large extent, it was in efforts either to reject or defend Wundt's reaction-

²⁷ Edward B. Titchener, "Wilhelm Wundt," *American journal of psychology*, 32 (1921), 161-178: 178, fn 34.

time research that an international community of experimental psychologists found its identity. Many of them first experienced this community in the Leipzig Institute for Experimental Psychology.

C. The social organization of research in the Leipzig Institute, the set-up for experiments.

The Leipzig experiments just reviewed began in 1879. Their research set-up already had its final form, where the human players were concerned. Although instrumentation developed and theories were altered, the social organization of research remained remarkably stable. It is worthwhile to take a closer look at the Wundtian experimental set-up, since it, like instrumentation, was more directly transferable to other institutions and to other cultural environments than were the theories and philosophical framework which reigned in the Leipzig Institute.

Ten years after official establishment of the Institute an occasion arose which called for Wundt to reflect upon his accomplishment. For the 1893 Columbian Exposition in Chicago, an international celebration of industry and science, German academics prepared a volume designed to put the best of their universities forward to the world. Wundt contributed an article, "Experimental psychology and psychophysics."²⁸ That such a chapter would be included in such a volume is a measure of the importance attached to the development of Wundt's line of research, just twenty years after the *Grundzüge* first appeared. Sixteen years later, when Leipzig University celebrated the 500th anniversary of its founding in 1409, Wundt had another opportunity to sketch a history and a description of his Institute.²⁹

Both sketches describe the same set-up for psychological experimentation. That stability was a result of Wundt's many years of preparation before coming to Leipzig. As de facto director of Helmholtz's institute in Heidelberg, Wundt had ably routinized the work there. He did a similar job in Leipzig, even before he had ministry support for his Institute. When Külpe assumed the position, the Institute Assistant began to run routine operations for Wundt, much as Wundt had done it for Helmholtz.

²⁸ Wundt, "Psychophysik und experimentelle Psychologie," in *Die deutschen Universitäten (für die Universitätsausstellung in Chicago 1893 unter Mitwirkung zahlreicher Universitätslehrer)*, ed. W. Lexis vol. 1 (Berlin: A. Asher, 1893), 450-457.

²⁹ Wundt, "Das Institute für experimentelle Psychologie," in *Festschrift zur Feier des 500 jährigen Bestehens der Universität Leipzig* (Leipzig: Rektor u. Senat der Universität, 1909), vol. 4: *Die Institute und Seminare der Philosophischen Fakultät an der Universität Leipzig. Part 1: Die philosophische und die philosophisch-historische Sektion.* 118-133.

Wundt's most detailed description of the organization of the Institute's work appears in the 500th-anniversary sketch. The Institute, he wrote, had two functions: to give an introductory course in the methods of experimental psychology, usually taught by an Institute Assistant, and secondly, to carry out original research.

The plan for the research projects is determined in a special assembly of all participants on the opening day of each semester. The director distributes the topics to be worked on, those to be continued from the previous semester as well as those newly chosen. In the case of the latter, consideration is given to the special wishes of particular older members who are interested in a certain theme. Then the members are divided into groups, each of which is occupied with a special topic. Participation in a group is voluntary, and each member is allowed to participate in several groups, as time and schedules allow. This group structure is as a rule necessary for psychological experiments, because it is best if the observer and experimenter are different persons; moreover it is desirable that results from a single observer should be controlled by those from the others. It can also happen with complicated experimental set-ups that it is necessary for different parts of the apparatus to be handled by different experimenters. There are very few tasks which are suitable for just one person with the combined job of observer and experimenter.

After the participants have been divided into separate groups, the schedule for the semester is determined, as well as the distribution of work space for the different groups at their different times. After groups are constituted, a leader is designated for each one. This is usually an older member of the Institute who has proved himself in previous semesters by helping in others' projects. The leader assembles the results of the experiments and, in the case that they are suitable, prepares them for publication. Whether results are published or not, the protocols of the experiments always remain the property of the Institute.

[Der Plan für die spezielleren Arbeiten wird in jedem Semester am Eröffnungstage des Instituts in einer besonders dazu anberaumten Versammlung aller Mitglieder festgestellt. Es werden zu diesem Zweck zunächst von dem Direktor die zu bearbeitenden Themata, und zwar sowohl die aus den vorangegangenen Semestern übernommenen wie die neu gewählten mitgeteilt. Bei den letzteren wird zugleich tunlichst auf etwaige spezielle Wünsche der einzelnen älteren Mitglieder, die sich für ein bestimmtes Thema interessieren, Rücksicht genommen. Dann wird eine Verteilung der Mitglieder in die einzelnen Gruppen vorgenommen, deren jede sich mit einem bestimmten Thema zu beschäftigen hat. Der Zutritt zu einer Gruppe erfolgt freiwillig, und es ist, sofern eine Zeitkollision zu vermeiden ist, jedem Mitglied die Teilnahme an mehreren Gruppen gestattet. Diese Gruppeneinteilung ist in der Regel bei psychologischen Versuchen gefordert, da bei ihnen Beobachter und Experimentator meist verschiedene Personen sein müssen und es überdies wünschenswert ist, dass die Resultate eines einzelnen Beobachters durch die anderer kontrolliert werden. Auch kann es bei komplizierteren Versuchseinrichtungen vorkommen, dass es nötig ist, die verschiedenen Teile der Apparate durch mehrere Experimentatoren bedienen zu lassen. Demgegenüber sind nur wenige Aufgaben zur Behandlung durch eine einzige Person, die dann die Eigenschaften des Beobachters und Experimentators in sich vereinigt, geeignet. Nach der Verteilung der Mitglieder in die einzelnen Gruppen wird der Stundenplan für das folgende Semester festgestellt, mit dem zugleich die geeignete Verteilung der Arbeitsräume an die Gruppen innerhalb der für die Arbeiten bestimmten Zeit stattfindet. Nach der Konstituierung der Gruppen wird ferner für jede ein Leiter designiert. Als solcher funktioniert regelmässig ein älteres Mitglied des Instituts, das sich in vorangegangenen Semestern durch die Mithilfe an andern Arbeiten bereits erprobt hat. Dieser Leiter der Gruppe hat dann schliesslich auch die Versuche zu bearbeiten und, falls sie sich dazu eignen, ihre Veröffentlichung zu redigieren. Ubri gens werden die Versuchsprotokolle selbst in jedem Falle, ob nun die Untersuchung publiziert worden ist oder nicht, als Eigentum des Instituts

betrachtet.]³⁰

Unlike the control conditions in today's experimental psychology, all actors typically knew all the roles and simply rotated through all the positions: subject [Reagent], experimenter [Experimentator] and observer [Beobachter]. The alternation of roles in the Institute had obvious pedagogical advantages, but Wundt's words make clear his conviction that the arrangement also had scientific value. His description clarifies the need for different observers, but it was also important that observers served as subjects in their own experiments as well. In the Leipzig set-up for psychological experiments, the subject had to know as much about the experiment as the experimenter or the observer, in order to be sure he was doing the reaction correctly. Reaction-time experiments, for example, depended upon consistency in the reporting of "recognition." For experiments in his Institute, Wundt insisted that subjects be trained, perhaps even, as Cattell recalled, "that only psychologists would be the subjects in psychological experiments."³¹

Exceptions to the institute-centered experiment only proved the rule in Leipzig. Cattell preferred to set up his experiments in his apartment, where work would not be limited to the hours the Institute was open. However, he also disagreed with Wundt on the need for the third person; he and his friend Berger worked together, without the separate observer.³² Their line of thinking and their experimental results challenged and even slightly altered Wundt's design of the reaction-time experiment, but Wundt did not change his fundamental theory of mental processes nor his requirements for the experimental set-up.

Although most psychologists now reject essential aspects of Wundt's set-up for the psychological experiments, its advantages in early laboratories should not be overlooked. Like any standard method, it achieved a certain stability of results and gave a clear point of departure for critics. It was also easily transferable. Even foreign students and visitors who had little understanding of, or interest in, German

³⁰ Wundt, "Das Institut für experimentelle Psychologie," *ibid.*, 131-132. These protocols, which might have given interesting data on experimental methodology and strategy in the Institute, were destroyed with the Institute during the Allied bombing of Leipzig on 4 December 1943. See UAL, Phil. Fak. B1/14(raised)37 B V, Psychologisches Institut, 1928-1945, Bl. 86-90.

³¹ Bird T. Baldwin, ed., "In memory of Wilhelm Wundt," *Psychological review*, 28 (1921), 156.

³² Michael M. Sokal, ed., *An education in psychology: James McKeen Cattell's journal and letters from Germany and England, 1880-1888* (Cambridge, Mass.: MIT Press, 1981), 127, 139.

idealistic philosophy and Wundt's larger theoretical concerns could understand the function of the apparatus and the operation of a research team.

Enthusiastic adoption of techniques without due attention to underlying theory and intent spelled conflict down the road; but no alternative theoretical position really threatened Wundt's way of doing things during the 1880s, and Wundt was happy to let a thousand flowers bloom. He had, so he tells us later in life, never intended to be "head of a school." He only wanted to establish a research program for the experimental investigation of conscious mental processes.

Chapter V

Institutionalizing experimental psychology:

Leipzig psychology goes out into the world, 1880-1895.

German universities were world leaders in research, and Wundt's popularity abroad added considerably to his--and psychology's--prestige both in Leipzig and in Germany as a whole. The reception of the new psychology in German universities was varied, something puzzling when compared to its successes abroad, which in some cases were more rapid and enthusiastic than in Germany itself.

Four indices serve as a useful guide to the spread of the new discipline, and these indices also inform Wundt's own experience. First, Wundt had a strong personal commitment to defining experimental psychology as a distinct field of research. When he arrived in Leipzig, an established group of philosophers, physiologists and even an astrophysicist supported the idea, each to a greater or lesser extent. Wundt's program assisted Leipzig University in administering the general educational needs of the state of Saxony, by training teachers and giving appropriately congenial philosophical training to students of natural sciences and mathematics. In addition to (1) personal commitment to the discipline, (2) support by the established older generation of intellectuals, and (3) fitting needs in the university and educational system, there is one more fairly obvious, but no less important, index (4) the relevance and accessibility of the German language and cultural context of the new discipline. Certainly this last is related to the second and the third. It deserves separate consideration, however, since experimental psychology went beyond the borders of Germany and beyond Wundt's own generation within Germany.

A. The remarkable success in America.

Whereas Wundt's Institute saw several years of administrative struggle for funding and space, many of the Americans were able to proceed with the establishment of laboratories more quickly. Experimental psychology grew prodigiously in the U.S.A., and many leaders in the enterprise trained in Wundt's Institute.

These Americans had a high level of personal commitment to the new field. After they took their doctoral degrees with Wundt, most of them returned to head departments of psychology and

psychological laboratories in the U.S. Having taken the special trouble to come to Leipzig to study experimental psychology with Wundt, their professional commitment to the new field was generally greater than that of Wundt's German students, who typically became secondary school teachers.

Back in the States, the older generation of American philosopher-psychologists--the teachers and mentors of Wundt's American students--generally supported the new field of research. They followed developments in German psychology quite closely. This group--Wundt's contemporaries, or those somewhat younger--included William James, Charles S. Peirce, George Trumball Ladd, and J. Mark Baldwin. James and Baldwin were also early visitors to Wundt's Institute. Though not particularly experimental in their own work, and often critical of Wundt's, they helped cultivate the American field for the German, experimental variety of psychology; and they encouraged their students to go to Europe and learn about it.¹

First among the Americans in Wundt's laboratory chronologically, and perhaps also in importance, was Granville Stanley Hall (1844-1924). After two European tours, he got his Ph.D. in 1878 at Harvard. Although the degree was in physiology, he consulted with physiologist-turned-psychologist and philosopher, William James. Then Hall went to Leipzig, where he heard some of Wundt's lectures and observed the first experiments students did in the store-room during the fall of 1879. His participation seems to have been limited to serving as a subject, but he went back, became Professor of Psychology and Pedagogy at Johns Hopkins University and opened America's first psychological laboratory on the Wundtian model in 1883.² Among those exposed to experimental psychology in Hall's lab at Hopkins was James McKeen Cattell, the first American to get the doctoral degree with Wundt for work on experimental psychology.³ Hall and Cattell were only the first of many Americans to come study psychology with Wundt.

Twenty-one Americans took the degree in Leipzig with Wundt as *Doktorvater*, according to an

¹ Edwin G. Boring, *A history of experimental psychology*, 2nd ed. (NY: Appleton-Century-Crofts, 1950), 505-549. Hereafter Boring.

² Norma Bringmann and Wolfgang G. Bringmann, "Wilhelm Wundt and his first American student," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 176-192; 178-179. Dorothy Ross, *G. Stanley Hall: The psychologist as prophet* (Chicago: U. Chicago Press, 1972).

³ Michael M. Sokal, ed., *An education in psychology: James McKeen Cattell's journal and letters from Germany and England, 1880-1888* (Cambridge, Mass.: MIT Press, 1981), 62-82.

authoritative compilation. This total includes Münsterberg, F.M. Urban and Titchener, important teachers of psychology in America (though of German, Austrian and British nationality, respectively). Fifteen of the twenty-one became some kind of psychologist in the U.S. They are (giving years of the doctoral degree) Hugo Münsterberg (1885), James McKeen Cattell (1886), Harry Kirke Wolfe (1886), Edward Aloysius Pace (1891), Frank Angell (1891), Edward Wheeler Scripture (1891), Edward Bradford Titchener (1892), William Alexander Hammond (1892), Lightner Witmer (1893), Charles Hubbard Judd (1896), George Malcolm Stratton (1896), Guy Allan Tawney (1897), Walter Dill Scott (1900), Frederick Mary Urban (1903), and George Frederick Arps (1908).⁴

There were other Americans--it would be very difficult to get a good count of these--who did not take degrees with Wundt, but who spent significant time in Leipzig as observers. Some worked in the Institute; others only attended Wundt's lectures. The first of these was G. Stanley Hall (1879-80). Then came J. Mark Baldwin (1884), Harlow Gale (1890), Howard C. Warren (1891-92), George T.W. Patrick (1894), Bird T. Baldwin (1906), Rudolph Pintner (1909-11)⁵ and probably several others.

American universities and educational systems responded to experimental psychology quickly and vigorously, and American psychologists made the most impressive progress of all in establishing psychological laboratories and achieving a distinct professional status for psychologists. Already in 1893, Wundt's major opponent in German psychology, Carl Stumpf, explicitly rejected a large institute, saying he was not interested in running a dissertation factory like "Wundt and the Americans."⁶ That was the same year Wundt featured the Institute in his article for the Chicago Exposition. Wundt had more psychological "grandchildren" in America even than in Germany, because his American students were so very prolific. In 1906 Wundt remarked to Külpe, somewhat wistfully, that "the New World,...in terms of international reputation and resources, is indeed still the Promised Land of

⁴ Anneros Metge, "Doktoranden Wilhelm Wundts," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig. Gesellschafts- und Sprachwissenschaftliche Reihe*, 29 (1980), 161-166. Comparing Metge's list with J. M. Cattell, *American men of science* 1st, 2nd, 3rd eds. (NY: Science Press, 1906, 1910, 1921), there were these non-psychologists with doctorates from Wundt: Gottfried Fritschel (1878), Friedrich David Sherman (1879), James Thompson Bixby (1885), William G. Smith (1894), Edward Moffat Weyer (1898), and William Squires (1902).

⁵ *American men of science* consistently lists Pintner with the Ph.D. from Leipzig in 1913. Metge does not list him. Either one source is in error, or someone other than Wundt was first reader for his Leipzig dissertation.

⁶ Carl Stumpf to Friedrich Althoff, 20 October 1893, Zentrales Staatsarchiv Merseburg, Rep 76 Va Sekt. 2 Tit. X Nr. 150 Bnd. 1 Bl 317-320. Translated in Mitchell G. Ash, "Academic politics in the history of science: Experimental psychology in Germany, 1879-1941," *Central European history*, 13 (1980), 255-286; 272.

psychology." [...der neuen Welt, ...was äussere Schätzung und Mittel betrifft, doch immer noch das gelobte Land der Psychologie ist.]⁷

Besides the Americans studying in Leipzig, there were also direct transfusions of German experimentalism into the New World by the early 1890s. William James brought Münsterberg to build a laboratory at Harvard. Edward Scripture, presumably with Ladd's approval, tried to lure Kirschmann to Yale, only to have him stolen away by Baldwin for Toronto. The fad of distinguished American philosophers signing up German experimentalists to run their psychological laboratories was, short-lived, however. The Germans were generally reluctant to give up prospects of careers in their native country. Aside from their general devotion to fatherland and culture, an American professor simply did not have the social status of a German professor. Moreover, psychology itself became something different in America than in Germany, certainly different than in Wundt's Institute.

Wundt's image of America as Promised Land derived not only from the pious invocations of his name in writings of his students there, but also from personal reports. One of the most enthusiastic and earliest, dated in December 1892, came from Scripture, on the letterhead of the new "Psychological Laboratory, Yale University":

You will scarcely be able to grasp what great progress psychology has made in America--just in the last year. There are now twelve laboratories, eight of which are directed by students of yours; two of the others are directed by students of Stanley Hall's. The other two are led by Münsterberg and Delabarre. Not of the least importance is that ultraconservative Yale University, by founding a laboratory, has given experimental psychology the imprimatur as not harmful to religion and morals. You could hardly believe how many people see a lurking materialism in physiological psychology--in the future they will surely have nothing to say.

In the spring or summer I will send you one or possibly two students from my laboratory to study psychology for a few years.

[Sie werden kaum begreifen, welche grosse Fortschritte die Psychologie in Amerika gemacht hat--selbst im letzten Jahr. Es gibt gegenwärtig zwölf Laboratorien, von denen acht von Ihren Schülern dirigiert sind; zwei von den anderen sind unter den Schülern Stanley Halls. Die zwei übrigen haben Münsterberg und Delabarre als Leiter. Nicht das Unwichtigste ist es, dass die ultraconservative Universität Yale durch die Gründung eines Laboratoriums die experimentelle Psychologie als der Religion und den Sitten ungefährlich gestempelt hat. Sie würden kaum begreifen, wie viele Leute in der physiologischen Psychologie einen verkappten Materialismus sehen--zukünftig werden sie wohl nichts zu sagen haben.

⁷ Wundt to Oswald Külpe, 31 December 1906, UAL, Wundt Nachlass, Nr. 411.

Im Frühling oder im Sommer übersende ich Ihnen einen oder vielleicht zwei Studenten aus meinem Laboratorium, um ein paar Jahre die Psychologie zu studieren.]⁸

There were, in fact, at least thirteen American psychological laboratories then, and it is impossible to determine exactly how Scripture got his count of eight Wundt students and four others. Interestingly, he did not count Münsterberg as one of Wundt's students. He also failed to take account of Mary Calkins's laboratory at Wellesley College. (Like Edmund Burke Delabarre, Mary Calkins had trained under Münsterberg and William James.) The two Hall students Scripture referred to were Joseph Jastrow and Edmund Clark Sanford, who both had the Ph.D. from Johns Hopkins. The laboratory there, founded in 1883, was closed by this time. These were the thirteen, with founder (and current director, where different) and starting year:

Pennsylvania: J.M. Cattell, L. Witmer (1888)
 Clark: E.C. Sanford (by 1889)
 Nebraska: H.K. Wolfe (1889)
 Iowa: G.T.W. Patrick (by 1890)
 Toronto: J.M. Baldwin (by 1890)
 Wisconsin: J. Jastrow (by 1890)
 Columbia: J.M. Cattell (by 1891)
 Cornell: F. Angell (1891)
 Wellesley: M. Calkins (1891)
 Brown: E.B. Delabarre (1892)
 Catholic U.: E. Pace (by 1892)
 Harvard: H. Münsterberg (1892)
 Yale: E.W. Scripture (1892)⁹

All of these people had titles--most of them professorships--in psychology. Of course, "professor" was a looser term in the United States than in Germany; there was no "professor of psychology" in Germany until after the turn of the century.

Experimental psychologists in America were not without problems of their own, of course. The Hopkins laboratory closed soon after Hall left for Clark, and Edward Scripture did not have smooth sailing with psychology at Yale. Ten years after his ideological victory, Scripture found himself drummed out, along with Ladd and the rest of the philosophy department, in the midst of a battle over academic

⁸ Edward Scripture to Wundt, 13 December 1892, UAL, Wundt Nachlass, Nr. 1434.

⁹ Data are from three sources. Where they disagree on dates, I indicate the latest date in the form, "by 1890," which means that another source may have reported, for example, 1888. William S. Sahakian, ed., *History of psychology, a source book in systematic psychology* (Itasca, Illinois: F.E. Peacock, 1968), 508-548 (appendix entitled "Landmarks in the history of psychology"); Cattell's *American men of science* (first three editions: 1906, 1910, 1921); C.R. Garvey, "List of American psychological laboratories," *Psychological bulletin*, 26 (1929), 652-660. Garvey lists 20 laboratories in North America by 1892, but some were more psychiatric than psychological.

policy, if not ideology. Twenty years passed before Yale had a psychological laboratory again.¹⁰ Nevertheless, in the early 1890s Scripture's pride in psychology's progress in America—even at conservative Yale—was justified.

The American success in starting up psychological laboratories and even establishing professorships of psychology in the 1880s and early 1890s reflected the rapid expansion of the American university system and with it the conscious promotion of educational innovations. The academic environment was receptive to psychology as well as to other new disciplines, especially in recently established, forward-looking universities like Johns Hopkins and Clark. Psychology found immediate applications in testing and other pedagogic research—Scholars on the Western side of the Atlantic generally did not subscribe to the strong German institutional separation of practical and theoretical aspects of science.

With few exceptions (perhaps only Scripture and Judd), American psychologists did not adhere to Wundt's theoretical views. They were eager to employ Leipzig instruments and experimental methodology, while less enthusiastic about the philosophical underpinnings for psychological research. Here, the pragmatic philosophy of William James and company better fit the American spirit. To Wundt, pragmatic philosophy was no philosophy at all. No doubt the difficulty in fully comprehending the German language and traditions in philosophy played a role in Americans' tendency to experiment and skirt the deeper theory (e.g. Cattell) or to develop independent theoretical views altogether (e.g. Titchener).

Because the language and cultural context were so different, American psychology did not remain Wundtian, despite the early influence. G. Stanley Hall, an innovator in more areas than experimental psychology, started up his psychological laboratories after only a bit of exposure to Wundt's lab. Wundt did not advise him directly, nor even his own American doctoral student, Cattell, on how to set up programs and careers in psychology. Rather, he let the Americans go their own way. Wundt had more than enough to do looking after those trying to advance the cause of psychology in Germany.

Eighteen of the twenty-one Americans who took doctorates with Wundt filed their dissertations in Leipzig by 1900. This virtual cut-off can be at least partially explained by the fact that American pro-

¹⁰ Arthur L. Blumenthal, "Shaping a tradition: Experimentalism begins," in *Points of view in the modern history of psychology*, ed. Claude E. Buxton (Orlando, Florida: Academic Press, 1985), 51-83; 74-78.

grams in psychology were well underway by that time. In the 1880s doctoral programs had barely begun in the States, but psychology quickly joined the list of academic specialties which awarded that degree. The relative decline in the influence of the German university in America nevertheless reflected more than just a build-up of domestic resources for higher education. Something was happening to the international spirit in science which, centered in Germany, had ruled the late-nineteenth century.

Wundtian psychology in the U.S. is a subject that requires renewed study.¹¹ It is difficult to determine when Wundt disassociated himself from American psychologists. He eventually accused them of straying from the true course in forsaking pure experimental psychology for applied psychology. Adding to his exasperation with the American trend was its attraction to German psychologists. Wundt had wanted to concentrate psychological research on theoretical foundations rather than on applications. Applied science, as German "mandarins" like Wundt held, was not the business of the university professor.

B. Other non-Germans: The young Herren Doktoren in the early Institute.

The students, researchers, and assistants who worked in Wundt's Institute had varied backgrounds and differing purposes for studying psychology. The most important group did research for doctoral dissertations, and most of these were Germans, Americans, and Eastern Europeans. But others in Wundt's laboratory did not do their doctoral work with him nor even necessarily in philosophy. Some of these foreign students transferred ideas of experimental psychology into other academic fields, such as medicine, history, language studies, economics or pedagogy.¹²

Particularly important for the earliest spread of experimental psychology were those who already had doctorates (some in philosophy, some in medicine) but wanted to inform themselves about the methods of the new experimental psychology. Ernst Meumann, one of the Institute Assistants, recalled the cooperative atmosphere and excitement of the early Institute:

¹¹ There are some preliminary studies: Arthur L. Blumenthal, "Wilhelm Wundt and early American psychology: A clash of cultures," in *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum Press, 1980), 117-135; Robert W. Rieber, "Wundt and the Americans: From flirtation to abandonment," *ibid.*, 137-151.

¹² For an overview of the connections to various fields, see 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.

Many participants who already had the Dr.phil. for years and who were accustomed to lecturing from the podium were obliged to do cardboard constructions and be handy with the hammer and saw, in order to build their apparatus and carry out their work.

[...mancher Mitarbeiter, der schon jahrelang seinen Dr.phil. hinter sich hatte und gewohnt war, auf dem Katheder zu dozieren, wurde zur Ausführung von Papparbeiten und zum Hantieren mit Hammer und Säge herangeholt, um mit selbstgeschaffenen Apparaten seine Arbeit weiterführen zu können.]¹³

These participants shortened the time needed to carry Wundt's model for psychological research outside Leipzig. Although a few of the finished young scholars who came to the Institute were Germans, many others were foreign visitors eager to take Wundt's laboratory techniques back to their home countries. The enthusiastic young *Doktoren* came from many European countries, America, as just noted, and later even Japan.¹⁴

1. Russians.

The Russians, like the Americans, had an open field for developing the new psychology in their homeland. Unlike the Americans, they had to contend with official censorship.¹⁵

In spite of political problems, Russian researchers were able to advance a distinctly physiological approach to psychology, particularly in studies of reflex action. Ivan Mikhailovich Sechenov (1829-1905), the originator of this Russian trend, studied physiology in Germany and met Wundt in Helmholtz's Institute in Heidelberg. (See Chapter Two.) Sechenov's most famous disciple and his successor at Moscow University, Ivan Petrovich Pavlov (1849-1936), won the 1904 Nobel Prize in medicine for his studies of conditioned reflex in the digestion of dogs. Prior to Pavlov's famous work with dogs, the most consistent promoter of "reflexology" was Vladimir Mikhailovitch Bekhterev (1867-1927), the first Russian to work in Wundt's Institute in Leipzig.

¹³ Ernst Meumann, "Wilhelm Wundt zu seinem achtzigsten Geburtstag," *Deutsche Rundschau*, 152 (1912), 193-224: 205.

¹⁴ One way to get an idea of the tradition of Wundtian psychology in different countries around the world is to read the various contributions to international congresses held in Leipzig in 1979 and 1980. One meeting was of historians of psychology: Wolfram Meischner und Anneros Metge, eds., *Wilhelm Wundt—progressives Erbe. Wissenschaftsentwicklung und Gegenwart (Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig: Reihe Psychologie)*, (Leipzig, 1980), especially "Themenkreis 2: Wilhelm Wundt und die nationale Entwicklung der Psychologie," 191-281. A much larger forum: *XIInd International Congress of Psychology, Leipzig, GDR, 6-12 July 1980, Abstract guide*, two volumes, especially "Long Symposium 54: Symposium in Memoriam Wilhelm Wundt," vol. 1, 1-15.

¹⁵ Daniel P. Todes, "Biological psychology and the tsarist censor: The dilemma of scientific development," *Bulletin of the history of medicine*, 58 (1984), 529-544.

Bekhterev took his medical degree at Petersburg, then toured German and French centers of research in physiology and psychology in 1884. After spending some time in Wundt's Institute he founded the first Russian laboratory to do experimental psychology, two years later at the University of Kazan. In 1895 he started another one at Petersburg, and a year later he began publishing a journal for psychiatry, the first journal anywhere to contain the words "experimental psychology" in its title.¹⁶ In the twentieth century, Bekhterev's writings on reflex were to inspire the American behaviorist movement in psychology.

Wide-ranging studies and academic entrepreneurship made Bekhterev a kind of "Russian Wundt," but psychology did not attain independent institutional status in Russia until much later. For a long time, no one was really a psychologist by profession. For example, Woldemar von Tschich received his doctoral degree in Leipzig, where he participated in early reaction-time experiments. He moved on to direct a laboratory at Dorpat, but was a psychiatrist by profession, as was his predecessor, the German, Emil Kraepelin, who had started the laboratory. Nicolai Lange had a similar background in Leipzig; he became professor of philosophy in Odessa, but had no experimental laboratory.¹⁷

The first Russian institution exclusively dedicated to psychology came late in the game. After careful planning and discussions at Leipzig as well as other institutes in Germany and the U.S., the Wundtian Georgy Ivanovich Chelpanov (1862-1936) managed to open the Moscow Institute of Psychology in 1914.¹⁸ However, research successes and eventually also Leninist ideology made reflexology the dominant trend in Russian psychological thought by the 1920s.

Unlike the Americans, early Russian students of Wundtian psychology did not have a strong professional identity as psychologists; they functioned as physiologists, psychiatrists, or philosophers in the Russian universities. Even when Chelpanov did undertake specialization, the older generation of reflex physiologists offered strong opposition, particularly once the prestige of Pavlov was enhanced by

¹⁶ *Obozrenie psikiatrii, nevrologii i eksperimental'noi psikhologii*, 20 vols. (1896-1918).

¹⁷ Woldemar von Tschich, "Über die Zeitverhältnisse der Apperception einfacher und zusammengesetzter Vorstellungen, untersucht mit Hilfe der Complicationsmethode," *Philosophische Studien*, 2 (1885), 603-634; Nicolai Lange, "Beiträge zur Theorie der sinnlichen Aufmerksamkeit und der activen Apperception," *Philosophische Studien*, 4 (1888), 390-422.

¹⁸ Alex Kuzolin, "Georgy Chelpanov and the establishment of the Moscow Institute of Psychology," *Journal for the history of the behavioral sciences*, 21 (1985), 23-32.

Lenin's new political-intellectual order, which condemned German idealism.

Again in contrast to the Americans, Russian intellectuals had a strong affinity for German idealism throughout the nineteenth century: witness Lenin's determination to combat its influence.¹⁹ More of Wundt's books were translated into Russian than into any other single language. Eleonore Wundt's bibliography of 1927 gives sixteen translations into Russian, compared to eleven Spanish and only seven English.²⁰ The ideas and theories were there. They were understood and popular with a small intellectual elite. There was simply no institutional structure in which to build a separate discipline of psychology. The Russian case was paralleled by other Eastern European countries, particularly in the Balkans, whence many of Wundt's doctoral students came.²¹

2. Belgians.

Of Western Europeans, the Belgians had the earliest and strongest connections to the Leipzig Institute. Their countrymen Plateau and Delboeuf helped lay the foundations of psychophysical method, and some of the younger generation of Belgians wanted to expand psychological research in the Wundtian fashion. A key figure was George Dwelshauvers (1866-1937), an ardent promoter of experimental psychology both in Belgium and in France. After receiving the doctorate in Brussels and then working in Wundt's Institute, he returned to the Belgian capital in 1889, intending to open a psychological institute and to let the true way of experimental psychology rescue his "extremely unphilosophical country" [unserem höchst unphilosophischen Land] from the "comical masquerades" [lächerliche Maskerade] of the "spiritualists, positivists, and materialists."²²

While in Leipzig Dwelshauvers shared in the excitement of Ludwig Lange's new methodology for the reaction-time experiment. With five experimental subjects, he investigated the effects of different time intervals in which attention prepared for the muscular and for the sensorial reaction. The prepara-

¹⁹ See, for example, Martin Malia, *Alexander Herzen and the birth of Russian socialism 1812-1855* (Cambridge, MA: Harvard University Press, 1961).

²⁰ Eleonore Wundt, *Wilhelm Wundts Werk* (Munich: Beck, 1927), 63-66.

²¹ See, e.g., Christfried Tögel, "Wilhelm Wundt und seine bulgarischen Schüler," *Zeitschrift für Psychologie*, 191 (1983), 81-90.

²² George Dwelshauvers to Wundt, 6 October 1889, UAL, Wundt Nachlass, Nr. 1131; 22 December 1889, UAL, Wundt Nachlass, Nr. 1134.

tion signal and the stimulus were both acoustical. Dwelshauvers alternated preparation times of 0, 1.5, 3, and 6 seconds and obtained results that “fully supported Lange’s distinction.” The shortest sensorial reaction took an average of 60 ms longer than the longest muscular reaction. The shortest reactions occurred after preparation time of 1.5 seconds, and subjects reported that the 6-second preparation was “unpleasant and tiring.”²³ There were some preliminary observations concerning practice, use of different time intervals between experiments, and subjects’ own assessments of their performance.

Dwelshauvers presented his laboratory study for habilitation in philosophy at Brussels, but the faculty rejected it. No doubt the “spiritualists, positivists, and materialists” among the philosophers did not see the usefulness of his work.²⁴ His initial failure to win friends for experimental psychology meant that his laboratory in Brussels, begun by 1890, had to limp along for a while. By 1893, however, it had four rooms and some financial support,²⁵ as Belgian universities became increasingly receptive to the new field.

Dwelshauvers’s articles, books, and lecture tours did much to promote interest in experimental psychology in Belgium and also, to some extent, in France. He joined Désiré (later Cardinal) Mercier, professor of philosophy at Louvain University, in the effort to make the new psychology a bridge between Catholic Thomist philosophy and modern science.²⁶ They sent young researchers to study with Wundt, including F.V. Dwelshauvers (cousin to George), Albert Michotte (who became the most prominent Belgian psychologist of his time), and Armand Thiéry (a canon who got his doctoral degree with Wundt in 1895).²⁷

By the late 1890s the Belgian followers of Wundt had strong professional commitment, some backing from senior colleagues, and support in the developing educational institutions. German cultural and philosophical traditions there were probably not as strong as the French, but there were Belgians

²³ Georg Dwelshauvers, “Untersuchungen zur Methodik der activen Aufmerksamkeit,” *Philosophische Studien*, 6 (1891), 217-249; 226-229.

²⁴ For a discussion of the failed habilitation, see Götz Martius’s partisan review, *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 130-132.

²⁵ Georges Dwelshauvers to Wundt, 3 August 1893, UAL, Wundt Nachlass, Nr. 1139. This letter contradicts Sahakian’s chronology, which puts the opening of the Brussels laboratory in 1897: William S. Sahakian, ed., *History of psychology, a source book in systematic psychology* (Itasca, IL: F.E. Peacock, 1968), 524.

²⁶ Henryk Misiak, “Leipzig and Louvain University in Belgium,” *Psychological research*, 42 (1980), 49-56.

²⁷ Henryk Misiak and Virginia M. Staudt, *Catholics in psychology: A historical survey* (NY: McGraw-Hill, 1954), 34-110.

who understood German idealism better than the American psychologists, and the neo-Thomists in particular were anxious to make use of certain aspects of German thought.

3. Danes.

Considering the ideological issues often associated with the study of the mind, it is ironic that Wundt's style of psychology enjoyed earlier reception in Catholic Belgium than in Scandinavia. Scandinavia's first experimental psychologist, Alfred Lehmann (1858-1921), promised to give Leipzig psychology a strong start in the north, but local academic politics worked against him.

After completing his doctoral dissertation, a study of physical aspects of color aesthetics, in Copenhagen in 1884, Lehmann spent a year in Wundt's Institute, where he developed a psychophysical method for investigating the color contrast of visual brightness.²⁸ Back in Copenhagen he erected, at his own expense, one of the first psychophysical laboratories outside of Germany, where he began experiments to challenge the theory of association expounded by Denmark's reigning philosopher, Harold Höffding (1843-1931).

Höffding posited that immediate recognition by similarity was fundamentally different from association by contiguity of ideas in consciousness. Lehmann, more in keeping with Wundt's notion of association as an act of apperception, did experiments to show that all associative processes were essentially contiguous focussing of attention, that there was no distinct act of associative recognition. The Lehmann-Höffding debate appeared in Wundt's journal.²⁹ Höffding quickly tired of public debate with Lehmann, but he may have used his influence to slow the academic advancement of his opponent: Lehmann did not become full professor in Copenhagen until late in his career, in 1919.³⁰

Another study by Lehmann became very important to the work in Leipzig: bodily correlates of emotions, specifically pulse and breathing. Again Lehmann essentially supported the Wundtian notion

²⁸ Alfred Lehmann, "Über die Anwendung der Methode der mittleren Abstufungen auf den Lichtsinn," *Philosophische Studien*, 3 (1886), 497-544.

²⁹ Alfred Lehmann, "Kritische und experimentelle Studien über das Wiedererkennen," *Philosophische Studien*, 7 (1893), 169-212; Harold Höffding, "Zur Theorie des Wiedererkennens. Eine Replik," *Philosophische Studien*, 8 (1892), 86-96.

³⁰ Ingemar Nilsson, "Alfred Lehmann and psychology as a physical science," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 258-268.

of active and creative apperception as against the theory of another of his countrymen. The Copenhagen pathologist Carl Lange (1834-1900) published a study of vasomotor reactions accompanying emotions and claimed, in opposition to the usual supposition, that mental states of emotions were responses to bodily occurrences (themselves brought about by reflex actions).³¹ Lehmann's experiments attempted to prove that emotions originated in the mind and then were expressed in certain parts of the body.³² His study influenced Wundt's theory of emotion, which was the basis of much of the work of the Leipzig Institute, beginning in the 1890s.

Although Lehmann had the professional commitment and the Danes certainly shared German cultural and intellectual traditions, the institutional and collegial supports for experimental psychology were not forthcoming. Lehmann's polemics against his countrymen in support of his German teacher probably contributed to his lack of academic status and to his isolation in Copenhagen. Experimental psychology in Scandinavia had to wait a generation or more before it had any distinct organization, even though Scandinavian philosophers and physiologists contributed relevant work.

4. British and French.

France and Britain did not play much of a role in the early spread of Wundt's style of experimental psychology. One of Wundt's first students was Edward Bradford Titchener (1867-1927), an Englishman who became a very important experimental psychologist. But Titchener's career unfolded in the U.S., at Cornell University, where he arrived shortly after taking his doctoral degree with Wundt in 1892. Charles S. Spearman (1863-1945) was the first of Wundt's doctoral students (1905) to work in Britain, and he came to study at Leipzig rather late in his career. Although British philosophers, physiologists and statisticians (especially Francis Galton and Karl Pearson) made important contributions to the development of experimental psychology, their work was hardly influenced by Wundt. Britain had its own empirical, philosophical tradition in psychology, which long remained unconcerned with experimentation.

³¹ Carl Lange, *Om sindsbevaegelser. Et psyko-fysiologisk studie* (Copenhagen, 1885); German translation: *Über Gemüthsbewegungen* (Leipzig, 1887).

³² Alfred Lehmann, *Die Hauptgesetze des menschlichen Gefühlsleben* (Leipzig, 1892).

Laboratory psychology had a somewhat larger following in France, though for obvious cultural-political reasons there were fewer French students and scholars working in German universities than Americans and Russians. Indigenous French psychology focussed on psychiatry and abnormal psychology. Jean-Martin Charcot (1825-1893) and Pierre Janet (1859-1947) in Paris and Hippolyte Bernheim (1837-1919) in Nancy did important research on mental diseases and investigated treatment by hypnosis. Théodule Armand Ribot (1839-1916) was primarily interested in psychopathology, but he also wrote two important books in the 1870s which demonstrated interest in the theoretical issues of normal psychology. One book reviewed English (associationist) psychology; the other surveyed the German (empirical, psychophysical) trends, devoting the largest section to Wundt's work.³³

Experimentalists who were influenced by Ribot's introductions included Alfred Binet (1857-1911), famous for the "Binet scale" in intelligence measurement, and Binet's pupil, Victor Henri (1872-1940), who worked in the Leipzig Institute in the mid-1890s. In spite of the fact that Henri was the French psychologist with the most experience in German psychophysics, he left the field in 1903 to become a professor of chemistry in Zurich and then in Liège.³⁴

Distinguished French scholars like Ribot were early inclined to support a Wundtian style of research and training in psychology, but the British were slow to develop an interest in German psychology. Neither country had people with a strong commitment to experimental psychology as a separate field, nor could their educational institutions provide an appropriate niche, had committed psychologists such as Titchener or Henri sought one. Finally, philosophical and cultural traditions in both France and Britain were, if anything, rather hostile to German literature and philosophy, so that German psychological literature had appeal to only a very limited audience.

Neither Britain nor France sent accomplished young scholars to Wundt's laboratory in the 1880s. On the other hand, the Americans, Russians, Belgians, and at least one Scandinavian had arrived, studied, and left eager to move the agenda in favor of experimental psychology in their universities back

³³ Théodule Armand Ribot, *La psychologie anglaise contemporaine (école expérimentale)* (Paris: Alcan, 1870; 3rd ed. 1896); *La psychologie allemande contemporaine (école expérimentale)* (Paris: Alcan, 1879; 5th ed. 1898). Both books were translated into English and German.

³⁴ Leonard Zusne, "Victor Henri," *Biographical dictionary of psychology* (Westport, CT: Greenwood Press, 1984), 183-184.

home. This group of young *Herren Doktoren* helped give Wundt's laboratory an immediate and strong impact outside Germany, both on styles of organization of psychological research and on topics of research, such as reaction-time studies.

Several German *Herren Doktoren* tried to help Wundt accomplish in their homeland what Hall, Dwellshauvers, and Bekhterev had done abroad, but, as the next chapter will show, they did not find an environment so friendly as Wundt enjoyed at Leipzig. And a few Germans who took doctorates with Wundt found their calling in psychology abroad.

C. Discontented German psychologists in the New World.

1. Münsterberg, success and "failure" at Harvard.

The first among Wundt's doctoral students to get an academic position and concentrate on experimental psychology was Hugo Münsterberg (1863-1916). He was also the first among Wundt's doctoral students seriously to challenge his teacher's views in print. Not surprisingly, their relationship is the subject of considerable discussion and occasional controversy.

Born to a middle-class, Jewish merchant family in the northern trade city of Danzig, Münsterberg studied French in Geneva then began medical studies in Leipzig in 1882, at age nineteen. He quickly gravitated toward the new psychology and completed the doctorate in philosophy under Wundt in 1885. It was in Leipzig, according to one writer, that young Münsterberg began his dispute with Wundt on whether the sense of effort in a muscular action originates in a signal from the central nervous system toward the muscles (Wundt's view) or in sensations developed in the muscles themselves (Münsterberg's). Since they disagreed, so the story goes, Wundt advised Münsterberg not to do an experimental study for the doctoral degree.³⁵ Münsterberg's dissertation, "The theory of natural adaptation in its development, use and meaning, with particular reference to psychophysical organization [Die Lehre von der natürlichen Anpassung in ihrer Entwicklung, Anwendung und Bedeutung mit besonderer Berücksichtigung der psycho-physischen Organisation]," was not an experimental study, but it was certainly related to psychology. Wundt signed off on the dissertation in 1885, but it did not appear in

³⁵ A. A. Roback, *History of American psychology*. 2nd ed. (NY: Collier, 1952), 212-233.

Philosophische Studien.

Münsterberg decided not to finish his medical education in Leipzig. Instead he went to Heidelberg, where he completed the medical doctorate in 1887. Moving on to Freiburg, he habilitated as Privatdozent that same year, started teaching philosophy, married and began a family. He also set up his psychological laboratory in two large rooms of his home.

Münsterberg's was probably the fourth German laboratory to train students in experimental psychology. (Chapter Seven discusses those of Ebbinghaus and G.E. Müller.) Though only a Privatdozent, Münsterberg was nevertheless able to support his research through his personal inheritance. His resources--combined with his ambition--enabled him to do work in psychology that was independent of Wundt and much broader in scope than the work of Ebbinghaus or Müller. Münsterberg hired a mechanic to build apparatus of his own design or adaptation. When Theodore Flournoy was appointed to a new professorship of physiological psychology in Geneva in 1892, he ordered duplicates of all of Münsterberg's equipment.³⁶

Münsterberg's publications posed direct challenges to Wundt's views in psychology. His habilitation essay supported Carl Lange's theory of emotions and extended it to a general theory of will. Münsterberg opposed Wundt's notion that a psychic element could be created in the central nervous system; he saw no need to posit anything more fundamental than sensations and nervous reflexes in reaction to them.³⁷ Beginning in 1889, Münsterberg began a series of studies, *Beiträge zur experimentellen Psychologie*, which supported the views set forth in the habilitation essay with experimental studies, all more or less directed against Wundt's doctrine of central control of mental processes. These studies established Münsterberg as an experimenter of considerable ability. His first important student, the American E.B. Delabarre, did his dissertation on the sense of movement ("Ueber Bewegungsempfindungen," 1891), continuing work on the area of disagreement between Münsterberg and Wundt. These Freiburg studies did not go unnoticed in Leipzig, as we shall see.

³⁶ [William O. Kohn], "Freiburg," *American journal of psychology*, 4 (1892), 587.

³⁷ Hugo Münsterberg, *Die Willenshandlung. Ein Beitrag zur physiologischen Psychologie* (Freiburg: Mohr, 1888). Roback, a student of Münsterberg, claimed that Wundt rejected this study as a dissertation, so Münsterberg had to go elsewhere and use it for habilitation. Roback, *op. cit.*

Münsterberg's energy and intellectual capacity helped make him a successful lecturer in Freiburg. He became Extraordinarius in 1891 and taught many topics in philosophy, in addition to psychology. He also took interest in the French work on hypnosis and gave a course of lectures on the topic.

This last bit of research foreshadows Münsterberg's interest in applied psychology, an interest that quickly grew once he arrived in the United States. By contrast, Wundt's reaction to the increased attention to hypnotic experiments was an essay arguing that hypnotic suggestion was not an experimental method which could give precise information about the subject's mental processes. Such experiments did not meet his criteria for experimentally controlled self-observation, since, *inter alia*, roles were not interchangeable.³⁸

In a letter to Münsterberg, William James praised him as "the ablest experimental psychologist in Germany," and asked him to come to Harvard for three years and direct a new psychological laboratory.³⁹ James realized that the new discipline was outstripping his own amateurish efforts in the laboratory,⁴⁰ and he was attracted by the young man's originality in experimentation. He wrote to his Harvard colleague Josiah Royce:

It is in the laboratory that he appears at his best, and that best is *very good*. His indefatigable love of experimental labor has led him to an extraordinarily wide range of experience, he has invented a lot of elegant and simple apparatus, his students all seem delighted with him, and so far as I can make out, everyone recognizes him to be, as a *teacher*, far ahead of everyone else in the field, whatever you may think of his published results.⁴¹

James also convinced himself that there was ample flexibility in Münsterberg's philosophical position. Although thoroughly sensationalistic, if not materialistic in his psychological theories, Münsterberg had, like the pluralist James, a more idealistic expression in other areas of philosophy. It was precisely this kind of division of intellectual turf that Wundt disliked.

³⁸ Wundt, "Hypnotismus und Suggestion," *Philosophische Studien*, 8 (1893), 1-85. This line of analysis is discussed in Kurt Danziger, "Wundt's psychological experiment in the light of his philosophy of science," *Psychological studies*, 42 (1980), 109-122.

³⁹ William James to Hugo Münsterberg, 21 February 1892, quoted in Phyllis Keller, *States of belonging. German-American intellectuals and the First World War* (Cambridge, MA: Harvard U. Press, 1979), 25.

⁴⁰ On James's early Harvard laboratory, see R. Harper, "The first psychological laboratory," *Isis*, 41 (1950), 158-161. Cf. Wolfgang G. Bringmann, Norma J. Bringmann, and Gustav Ungerer, "The establishment of Wundt's laboratory: An archival and documentary study," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 123-157; 153-155.

⁴¹ William James to Josiah Royce, 22 June 1892, quoted in Phyllis Keller, *op. cit.*, 26.

Although they had their disagreements later, James and Münsterberg's mutual opposition to Wundt initially made them very compatible. James and his friend, Carl Stumpf, had already decided that Wundt was their opponent, if a formidable one. They found encouragement in Münsterberg's defection to their side.⁴² James had formulated his conceptions of habit and "ideomotor action" in parallel with, though without knowledge of, Carl Lange's theory of emotions (which became known as the James-Lange theory of emotions).⁴³ So Münsterberg's treatise on the will also happened to support James. Both had employed an extended concept of reflex.⁴⁴

Münsterberg became a prominent experimental psychologist, and, like Wundt, a successful organizer of psychological laboratories for training and research, first briefly at Freiburg and then impressively at Harvard. However, his theoretical views put him outside of Wundt's circle. The theoretical differences between Wundt and Münsterberg involved differences in their visions for the field of psychology. In America Münsterberg became a major proponent of applications of psychology to law, commerce and industry. In Germany, Wundt opposed the development of applications by academic psychologists.

After three successful years at Harvard, Münsterberg came close to becoming a professor in a German-language Swiss university. He failed to get the appointment, whereas an important student of Wundt's was able to capture the position for experimental psychology, as the next chapter details. Münsterberg agreed to stay at Harvard, but often sailed to Germany for vacations and sabbaticals. He even visited Wundt a few times.⁴⁵ Indeed, their personal relations were neither as unfriendly as is commonly supposed, nor as unfriendly as those between Wundt and James, and certainly less strained than those between Wundt and Stumpf. Responding to Münsterberg's congratulations on Wundt's seventieth birthday, only ten years after Münsterberg went to Harvard, Wundt noted that their views in philosophy

⁴² For example, William James to Carl Stumpf, 6 February 1887, in Henry James, ed., *The letters of William James*, vol. 1 (Boston: Atlantic Monthly, 1920), 262-264.

⁴³ William James, "What is emotion?" *Mind*, 9 (1884), 188-205.

⁴⁴ William R. Woodward, "William James's psychology of will: Its revolutionary impact on American psychology," *Explorations in the history of psychology in the United States*, ed. Josef Brozek (Lewisburg, PA: Bucknell U. Press, 1984), 148-195. For a discussion of the similarities and differences between the "psychological popes of the old and the new world," see Kurt Danziger, "On the threshold of the new psychology: Situating Wundt and James," in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 363-379.

⁴⁵ Margaret Münsterberg, *Hugo Münsterberg, his life and work* (NY: D. Appleton, 1912), 105, 155-156.

had much in common, and he even found value (albeit negative) in Münsterberg's work in psychology:

Even though our views on psychology differ today as much as ever, you can be assured that whenever I look back on my life, as these last days have prompted me to do, I appreciate that I owe much not only to those who stood by me as like-minded colleagues--I also owe much to those whose strict criticism of my opinions made it necessary for me to prove better that which I believed I had discovered; to secure better, if possible, that which was uncertain; or where a view became untenable, to admit as much, and readily concede. Among those whose opposition has been useful to me many times in this respect, you, honored colleague, are of the first rank.

[Wenn wir uns in der Psychologie dagegen heute wie immer in unseren Anschauungen trennen, so dürfen Sie überzeugt sein, dass ich bei meinem Rückblick auf mein Leben, zu dem ja diese Tage herausfordern, wohl zu würdigen weiss, wie vieles ich nicht nur denen zu danken habe, die mir als gleichgesinnte Mitarbeiter zur Seite standen, sondern auch denen, die mich durch eine strenge Kritik meiner Meinungen nötigen, das, was ich gefunden zu haben glaubte, womöglich besser zu begründen und das Unsichere, soweit ich es vermochte, zu sichern, oder aber wo es sich als unhaltbar erwies, dies einzugestehen und bereitwillig zuzugestehen. Unter denen, deren Widerspruch mir in diesem Sinne mannigfach nützlich gewesen ist, stehen Sie, verehrter Herr Kollege, mit in erster Linie.]⁴⁶

In spite of his success at Harvard and his contributions to the development of American psychology, Münsterberg never became an American, either officially or at heart. His feverish efforts to win American sympathy for the German cause in the World War helped bring on a stroke. Münsterberg died quite young--at 53--one morning during his lecture.

2. Kirschmann in Toronto.

Another Wundt doctoral graduate who went to North America, given no possibility of a career as professor in Germany, was August Kirschmann (1860-1932). Unlike Münsterberg, Kirschmann stayed within Wundt's intellectual circle. He was, in fact, one of the strictest Wundtians, though his own work remained technical and almost never ventured into theory.

After working ten years as an elementary school teacher, Kirschmann opted for a university education. He was an *Immaturus*, having no *Abitur* from a *Gymnasium*, so he had to find his way to a university with liberal admissions policies, such as Leipzig. Although he was fortunate that this prominent university afforded him an opportunity to study, Kirschmann still faced difficulties. For example, he was not allowed to habilitate on the faculty of any German university. Kirschmann later recalled

⁴⁶ Wundt to Hugo Münsterberg, [August] 1902, quoted in Felix Schlotte, "Beiträge zum Lebensbild Wilhelm Wundts aus seinem Briefwechsel," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig. Gesellschaft- und Sprachwissenschaftliche Reihe*, 5 (1955/56), 333-349; 347.

how unpleasant his initial Leipzig experiences were:

How quickly time flies. Now it has already been 28 years since I was first a schoolmaster and 18 years since my first shy attempts as a university student. I often think it was just yesterday that the strict Herr Hofrath Hessler 'showed me the door,' with the remark that 'foreign schoolteachers [*ausländische Pädagogen*] are not needed here,' and that I to my horror even forgot I had a certificate from the trade school [*Realschulzeugnis*] to show for the purpose of matriculation. A few years later when I was student assistant and Institute Assistant for Your Magnificence [the formal address for a *Geheimrat*], then the good gentlemen were much more polite.

[Wie schnell die Zeit vergeht--jetzt sind es schon 28 Jahre dass ich meine erste schulmeisterlichen und 18 Jahre seitdem ich meine ersten Versuche--und zwar sehr schüchternen--als Universitätsstudent machte. Ich meine manchmal es wäre gestern gewesen, als mich der gestrenge Herr Hofrath Hessler mit dem Bemerkten, dass man 'hier keinen ausländischen Pädagogen brauchen können,' zu 'der Thür' hinausschmiss und ich meinem Schrecken selbe vergass, dass ich ja auch noch ein Realschulzeugnis zum Zweck der Matriculation aufzuweisen hatte. Ein paar Jahre später als ich *Famulus* und Assistent bei Sr. Magnificenz war, da waren die Herren viel höflicher.]⁴⁷

No matter how many competent studies in experimental psychology he produced--and he produced several--Kirschmann could not shake the stigma of having no *Abitur* and, possibly even worse, of having been an elementary school teacher. Even his doctorate was delayed. Wundt had him present the dissertation in December 1889, but another committee member pointed out that Kirschmann had not been enrolled for the requisite six semesters and suggested that he postpone his application for the degree. The next semester, Kirschmann submitted a "nearly new" dissertation, according to Wundt's comment on the evaluation form.⁴⁸ Wundt was, incidentally, rector of the university during this year. Did the residency requirement slip his busy mind, or was he trying to be lenient with a talented student with deficient secondary school preparation?

In the Institute Kirschmann served as *Famulus* from winter-semester 1888-89 to winter-semester 1891-92, when Wundt made him his first *Privatassistent*, i.e., Wundt himself paid the salary. A year later Ernst Meumann became *Privatassistent*, and Kirschmann travelled to America. Külpe was the university-paid Institute Assistant during this entire period.

Kirschmann arrived in the United States with many contacts and possibilities. Wanting to promote research in experimental psychology but not wanting to do it himself, J. Mark Baldwin, for exam-

⁴⁷ August Kirschmann to Wundt, 12 December 1905, UAL, Wundt Nachlass, Nr. 1275.

⁴⁸ UAL, Phil. Fak., Promotionen: Kirschmann, August. 19 Mai 1890.

ple, tried to bring such an experienced Wundt assistant to Toronto. Baldwin wrote Wundt in the summer of 1892:

I am sorry to trouble you again. I have heard from D. Külpe that he is not willing to leave Leipzig--what I supposed to be the case.

In reference to Dr. Kirschmann I would say that I am afraid that his want of classical training would stand in his way: but if he cares to make application, as far as I now see, his chances would be better than those of anyone else. I myself am at present disposed to favor his application: but the appointment lies with the Minister of Education and he will have to compete with others from America and England. He should send an *application at once*, with testimonials and *copies of his printed things*.... I will leave to you the communication of these particulars to him.⁴⁹

In May 1893, Kirschmann sent a letter from San Francisco to inform Wundt of further developments. Baldwin had left Toronto for Princeton; so Toronto University sought a professor to replace Baldwin rather than a lecturer to assist him. Kirschmann formally applied for the job but had doubts about his suitability.

Indeed, I consider myself a philosopher, i.e., a person whose mental power is inclined and sufficient to seek out problems of knowledge, to recognize them and pursue them into their farthest hiding places. But where knowledge itself (Wissen) is concerned, I am really a great ignoramus, and it seems very questionable to me whether my general and philosophical education is sufficient for me to play the professor--especially under the difficult circumstances that my deficient knowledge of the English language will present; and I would not like to fake it. But I will give it a try, if they want me to. To direct a laboratory, if a measure of good intentions to do something is present--I believe I can undertake that right away.

[Zwar halte ich mich selbst für einen Philosophen, d.h. für einen Menschen, dessen geistige Kraft geneigt und ausreichend ist, die Probleme der Erkenntnis zu suchen, zu sehen u. hin bis in ihre verstecktesten Schlupfwinkel zu verfolgen; aber, was das Wissen anbelangt so bin ich eigentlich ein grosser Ignorant, und ob meine allgemeine u. philosophische Bildung ausreicht um der Professor zu spielen, dazu noch unter den erschwerenden Umständen, die die mangelhafte Kenntnis der englischen Sprache mir bereitet, das erscheint mir sehr fraglich, u. ich möchte es nicht gerne präbendieren. Aber probieren will ich's schon, wenn man's wünscht. Ein Laboratorium zu leiten, wenn einigermassen guten Willen vorhanden ist, was zu thun, das glaube ich gleich unternehmen zu können.]⁵⁰

Kirschmann's reservations show that he was self-conscious about his inferior status and could not see himself as a professor. To a German, a professor was someone who had classical education in the *Gymnasium* and had habilitated on the faculty of a German university. Kirschmann was lacking on both accounts. In addition, there was the possibility that the Toronto job would entail renewal of an

⁴⁹ J. Mark Baldwin to Wundt, 12 July 1892, UAL, Wundt Nachlass, Nr. 1032.

⁵⁰ August Kirschmann to Wundt, 17 May 1893, UAL, Wundt Nachlass, Nr. 1274.

unpleasant relationship from the Leipzig years.

Kirschmann did not want to go to Toronto if, as he had heard, Titchener were called from Cornell to replace Baldwin. In fact, Kirschmann did not think he could serve in any assistant capacity to Titchener.

Two experimental psychologists are too many for a small laboratory such as Toronto's; and besides, the difference between our views is simply too great. If Titchener belongs to your school at all, then he stands on the extreme left wing of those with strong medico-materialistic views which consider epistemology to be a useless game. In physiological psychology they emphasize the physiological so exclusively that one cannot imagine why they even call themselves psychologists. I myself belong to the more epistemological wing of your philosophical school, and as seldom as psychology (as the natural science of inner experience) should address itself to metaphysical and epistemological problems, still I believe we could not work together.

[Zwei experimentelle Psychologen sind zu viel für ein kleines Laboratorium wie Toronto, und überdies bestehen zwischen unseren Ansichten zu grosse Verschiedenheiten. Wenn Titchener sich überhaupt zu Ihrer Schule rechnet, so steht er sicherlich auf den äussersten linken Flügel bei den stark materialistisch Angehauchten, die Erkenntnistheorie für unnütze Spielerei halten und in der physiologischen Psychologie das Physiologische so ausschliesslich betonen, dass man nicht recht ansieht, warum sie überhaupt unter die Psychologen gegangen sind. Ich selber aber gehöre der mehr erkenntnistheoretischen Richtung Ihrer philosophischen Schule an, u. so wenig sich auch die Psychologie als Naturwissenschaft der inneren Erfahrung sich an metaphysische u. erkenntnistheoretische Probleme kehren soll, so glaube ich doch dass wir nicht zusammen arbeiten.]

Kirschmann had other opportunities in the New World. He had heard from G. Stanley Hall and Edward Scripture. The former asked him to submit articles to the *American journal of psychology*; the latter offered him a fellowship in the new laboratory at Yale--\$500, no obligations, with apparatus and assistants as he desired. "If I do not go to Toronto, I'll go to Scripture," Kirschmann wrote.

Titchener did not move to Toronto because financial difficulties forced the university to leave the professorship vacant for a while. In spite of his ambition "to be at the head of a department of modern psychology in England, or at least in the Empire somewhere,"⁵¹ Titchener never left Cornell. Kirschmann became Lecturer and Demonstrator in Philosophy, Associate Professor in 1899, and finally Professor at Toronto University in 1903.⁵²

⁵¹ Edward B. Titchener to [unknown], (1903), quoted in C. Roger Meyers, "Psychology at Toronto," in *History of academic psychology in Canada*, ed. Mary J. Wright and C. Roger Myers (Toronto: Hogrefe, 1982), 68-99; 76.

⁵² Marilyn E. Marshall, "The influence of Wundt's students in Canada: August Kirschmann," in *Wilhelm Wundt-progressives Erbe. Wissenschaftsentwicklung und Gegenwart (Wissenschaftliche Beiträge der Karl-Marx-Universität Leipzig: Reihe Psychologie)*, ed. Wolfgang Meischner and Anneros Metge (1980), 233-243.

There he built up an impressive laboratory and program of instruction which followed the Leipzig model with great faithfulness. Successful teaching, clever administration, and a respectable series of research publications enabled Kirschmann to expand his laboratory so that it was as large as Wundt's by 1900.⁵³ In 1905 Kirschmann gave a detailed report in a letter to Wundt.⁵⁴ The laboratory staff had grown to six; there were over one hundred honor students who took laboratory courses and another two hundred students in psychology lectures.

In spite of this success, the bulk of the letter was negative. Kirschmann complained of overwork; North American universities required too much teaching and left little time for independent research. Moreover, he continued to feel isolated in the New World and longed to return to his homeland. All the usual clichés about German *Kultur* and its superiority to Anglo-American "freedom" and crass commercialism came pouring forth from his pen. Kirschmann frankly admitted that his report had degenerated into a "jeremiad."

Overwork must have had something to do with it. Kirschmann's accomplishments were considerable, but his health deteriorated so much that he had to take a leave beginning in 1909. He drew a reduced salary until the war-year 1915, when the Canadian university was obliged to cease payments to the absent German national.

Kirschmann, the German Wundtian in Canada, was back at home when the World War broke out. He had to give up his professorship at Toronto, and he had no chance of achieving equivalent rank in Germany. He had, to his credit, built a solid tradition of experimental psychology in Toronto, and he was very proud of the achievement. Wundt employed him again as *Privatassistent* during the war, and Kirschmann was able to finish his long career in the Leipzig laboratory as *Honorarprofessor*.

Kirschmann and Titchener represented different branches from the Wundtian trunk, and their dislike of one another was mutual and longstanding. Titchener, who impressed and occasionally offended people at Cornell with his aristocratic Oxonian airs, developed a philosophical approach to psychology

⁵³ *University of Toronto studies. psychological series*, ed. August Kirschmann. The first number appeared in 1898 and the last one edited by Kirschmann, vol. 3, number 1, probably in 1908. The first bound volume is prefaced by a plan of the Toronto Laboratory in 1900, which consisted of sixteen rooms.

⁵⁴ August Kirschmann to Wundt, 21 December 1905, UAL, Wundt Nachlass, Nr. 1275.

which was, as Kirschmann accurately observed, rather different from Wundt's--more formal, without the flexibility of the apperception model. Kirschmann modestly stuck to psychophysical research and faithfully defended Wundt's theories. When Meumann was choosing an editorial board for a new journal, Wundt insisted on including Kirschmann, even though he admitted certain problems:

He will, properly engaged, and in spite of his 'schoolmasterly weaknesses,' be a very valuable contributor to the *Archiv*. I have just been reading through the literature he has produced at Toronto University, and he has brought more useful things to light there than have most of the Americans put together.

[Er wird, richtig herbeigezogen, trotz seiner Schulmeisterschwächen, ein sehr nützlicher Mitarbeiter des Archivs sein, und er hat in seinen Arbeiten von der Toronto-Universität, wie ich noch jetzt bei der Durcharbeitung dieser Literatur bemerkt habe, mehr Brauchbares zu Tage gefördert als die meisten Amerikaner sonst zusammengenommen.]⁵⁵

Wundt also took the opportunity to recommend Scripture, his favorite American psychologist, for Meumann's editorial board. The most German of the Yankees, Scripture had mastered the language and wrote letters to Wundt in polished German; the other Anglo-Americans wrote in English. Scripture was also more respectful of Wundt's methodological strictures than the other Americans, and his overbearing expression of the mission of experimental psychology probably contributed to his abrupt departure from Yale that same year, 1903.

Another criticism of Kirschmann by Titchener was quite justified. In a letter to A.A. Roback, he remarked that Kirschmann was "incapable" of writing a systematic work on psychology.⁵⁶ Kirschmann was an experimental fact-finder and technician. His publications dealt with psychophysics of vision, including contrast phenomena, color perception, and depth perception. He was not a psychologist who systematized research into general laws and principles.

D. Kiesow takes experimental psychology into Italy.

Another student of Wundt's whose background prevented him from a university career in Germany was Friedrich Kiesow (1858-1940), *Famulus* when Kirschmann was *Privatassistent*. Like Kirschmann, Kiesow was a psychologist of the technical stripe, in this case with very close ties to the field of

⁵⁵ Wundt to Ernst Meumann, 5 June 1903, UAL, Wundt Nachlass, Nr. 716a.

⁵⁶ Edward B. Titchener to A. A. Roback, 21 September 1918; quoted in A. A. Roback, *History of American psychology*. 2nd ed. (NY: Collier, 1952), 219.

physiology.

Illness forced Kiesow to break off his early schooling before the *Abitur*, and family finances required him to work several years as a private tutor in his native district of Schwerin-Mecklenburg. In 1891, at age 33, he went to Leipzig and enrolled as *studiosus paedagogicae* (student of pedagogy). These special students had graduated from normal schools rather than the *Gymnasia*. Leipzig University allowed a limited number of them to enroll, despite their deficient secondary-school preparation, with the plan that they would become teachers in the lesser secondary schools, such as the *Realschulen*.

Kiesow and other *stud.paed.* were probably attracted to Wundt because experimental psychology offered a modern approach to pedagogical theory. Wundt admitted Kiesow to the Institute, where he trained under Külpe and Meumann. In his fourth semester at Leipzig, Wundt made him *Famulus*, which proved to be the "determining factor of my career," as he wrote in his autobiography.⁵⁷

With this measure of financial and intellectual support, Kiesow began to study natural sciences. He worked in Paul Flechsig's psychiatric clinic and in Carl Ludwig's Institute of Physiology. In the early 1890s the aged Ludwig was assisted by Max von Frey (1852-1932), who had habilitated in Leipzig in 1882 and become *Extraordinarius* in 1891. Von Frey remained in Leipzig until 1898, shuttling back and forth between the physiological and psychological institutes. He specialized in physiology of the sensory organs and published important research on cutaneous sense. Warmth, cold, and pressure were known to be distinct modalities of the sense of touch, and von Frey demonstrated that pain was the fourth and only other modality. He began localizing and identifying the different sensory receptors and determining their thresholds.⁵⁸ Kiesow worked with von Frey on the sensitivity of the tongue and the mouth cavity and on the desensitizing effects of cocaine and gymnemic acid.⁵⁹ For his doctoral dissertation Kiesow wrote a general study of the sense of taste.⁶⁰

⁵⁷ "F. Kiesow," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 1 (Worcester, MA: Clark U. Press, 1930), 163-190; 171.

⁵⁸ His first important paper on this topic: Max von Frey, "Untersuchungen über die Sinnesfunktionen der menschlichen Haut," *Königlich sächsische Gesellschaft der Wissenschaften zu Leipzig, mathematisch-physikalische Sektion*, 23 (1897), 169-266.

⁵⁹ Friedrich Kiesow, "Ueber die Wirkung des Cocain und der Gymnemasäure auf die Schleimhaut der Zunge und des Mundraums," *Philosophische Studien*, 9 (1894), 510-527.

⁶⁰ Friedrich Kiesow, "Beiträge zur physiologischen Psychologie des Geschmacksinns," *Philosophische Studien*, 10 (1894), 329-368, 523-561.

Von Frey closely followed the work of another Ludwig student, Angelo Mosso (1846-1910), professor of physiology in Turin. Mosso improved graphic registration of circulatory and respiratory activity and researched the effects of emotions on those bodily correlates. Kiesow joined von Frey in similar investigations, and Alfred Lehmann, visiting from Copenhagen, also started his work on correlations between emotional states and pulse, blood pressure, respiration, and body temperature. Since the James-Lange theory contradicted Wundt's view that such mental states originated in the brain, Wundt took direct interest in the results of the experiments on emotions.

Although Kiesow had had no earlier training in medicine, his work in psychology was the most physiological of the research done in Wundt's circle. Wundt even had to remind Kiesow and von Frey that vivisection was inappropriate in the Institute for Experimental Psychology.⁶¹

In early 1894 Kiesow made his first visit to Mosso in Turin to learn about the Italian's new instrument for registering changes in arterial blood pressure, the sphygmomanometer.⁶² Later that year Kiesow brought one of these back to Leipzig, filed his dissertation, then went home to Schwerin to get married. There he received word from Wundt that Külpe was to become professor in Würzburg, and that Meumann would be the next Institute Assistant. Wundt added that he had also requested funding for a position of "Second Assistant" for Kiesow.⁶³ Kiesow attained something that the other *Immaturus*, Kirschmann, had not: a state title and salary in a university research institute.

Kiesow was Second Assistant for three semesters and, as such, continued his research on blood pressure, body temperature, and sense of taste. In the spring of 1896 he returned to Turin and became Mosso's assistant in the Institute of Physiology. He remained at that university for the rest of his long career, more content in Italy than Kirschmann was at Toronto or Münsterberg was at Harvard. On the European continent, where trains crossed the Alps, he felt less isolated from his homeland. He assimilated very well to the Italian academic community.

In 1901 Kiesow was appointed to a faculty position in experimental psychology (*libero docente*), and Wundt's congratulations contained a warm personal message:

⁶¹ Wundt to Friedrich Kiesow, 14 November 1894, UAL, Wundt Nachlass, Nr. 210.

⁶² Wundt to Friedrich Kiesow, 29 March 1894, UAL, Wundt Nachlass, Nr. 208.

⁶³ Wundt to Friedrich Kiesow, 3 October 1894, UAL, Wundt Nachlass, Nr. 209.

Among the many pleasant and unpleasant experiences that I have had in connection with this field, I can with all certainty name the one that has pleased me the most: that *two* of my most talented younger colleagues--you and Kirschmann--who because of formalities had the career in psychology closed to them in Germany, have found positions worthy of them in foreign lands.

[Unter den mancherlei erfreulichen und unerfreulichen Erfahrungen, die ich in meinen Beziehungen zu diesem Gebiete gemacht habe, kann ich aber sicher von denen, die mich am meisten erfreut haben, die nennen, dass *zwei* meiner tüchtigsten jüngeren Mitarbeiter--Sie und Kirschmann--denen ja aus äusseren Gründen der psychologische Lehrberuf in Deutschland verschlossen war, im Auslande die Ihnen würdige Stellung gefunden haben.]⁶⁴

In 1906 Kiesow was appointed to one of the three professorships in experimental psychology created in Italy.

Kiesow and Kirschmann, lacking German classical education and perhaps also the willingness to fake it, as Kirschmann put it, cultivated the technical side of Wundtian psychology abroad and left the theoretical and philosophical problems to their master in Leipzig. In spite of his support for them, Wundt often pointed out certain, predictable limitations of his "less qualified" disciples. Again advising Meumann on choice of editorial staff in 1903:

You can count on Kiesow for reviews concerning the lower senses. He will do a good job, though he may cast his net too broadly, so that it will not hurt to make cuts. And his own work in these areas will always be useful contributions. But beyond that I would accept things from him with caution. I think it is absolutely unthinkable to include him among the co-editors on the title page.

[Kiesow kann man das Referat über die niederen Sinne anvertrauen. Er wird das gut, wenn auch zuweilen zu breit machen, so dass Kürzungen nicht schaden dürften. Und auch seine eigenen Arbeiten über diese Gebiete werden immer nützliche Beiträge sein. Darüber hinaus wird alles von ihm mit Vorsicht aufzunehmen sein. Ihn als Mitherausgeber auf den Titel zu setzen, halte ich für absolut undenkbar.]⁶⁵

In this respect, Wundt did not rate Kiesow as highly as Kirschmann, whom he had strongly recommended as a co-editor. Perhaps Wundt no longer considered Kiesow to be part of German psychology, as he did Kirschmann, or perhaps Kirschmann's publications were more impressive.

Kirschmann and Kiesow's emphasis on technical aspects of psychological research--and their lack of interpretive and synthetic writings--did not seem to trouble Wundt, possibly because he did not expect more from them. More bothersome to Wundt were the well-educated young philosophers like Münsterberg, who used their technical skill to attack his theories of mind. Münsterberg was not the

⁶⁴ Wundt to Friedrich Kiesow, 15 February 1902, UAL, Wundt Nachlass, Nr. 220.

⁶⁵ Wundt to Ernst Meumann, 23 October 1902, UAL, Wundt Nachlass, Nr. 713.

only, nor even the first, of Wundt's German challengers. Before we consider the enemies, however, the next chapter examines Wundt's allies in Germany.

Chapter VI

Institutionalizing experimental psychology:

Modest gains in the German universities, 1887-1897.

A. Wundt's relations to other German universities.

Although Germany was the fatherland of experimental psychology, German universities had no professorships of psychology in the nineteenth century, and psychologists remained professors of philosophy. Wundt's view of the purpose of his specialty--that experimental psychology should provide the scientific basis for philosophy--found accommodation in the conservative organizational structure of German universities, which encouraged new directions of research, but which tried to keep them within existing disciplines. That arrangement, however, also meant that Wundt's ability to promote his field of research throughout Germany would depend on the general level of interest in experimental psychology among German philosophers.

This interest was very high in the 1880s, and Wundt built up an impressive measure of academic influence, for someone so new to his field. Many younger philosophers were enthusiastic about his work and sought his help in furthering their careers. Hans Vaihinger and Alois Riehl, for example, asked for his advice and his recommendation, though it is unclear whether Wundt actually helped them.¹ In one case at least, he did play an active role. He strongly recommended Theodor Lipps, whose interest in experimental psychology had put him in contact with Leipzig, for a professorship in Würzburg in 1888.² Wundt's recommendation, however, did not attain that position for Lipps.

Wundt was aware that the "scientific" approach to philosophy, though attractive to many, had its opponents in German universities. He was reminded of this by Richard Avenarius, who, as Privatdozent in Leipzig, had been associated with Wundt. Hoping to return to the Reich soon, Avenarius succeeded Wilhelm Windelband in the professorship that Wundt had held in Zürich. He observed, however, that

¹ Wundt to Hans Vaihinger, 20 June 1882, UAL, Wundt Nachlass, Nr. 906. On his chances for Munich: Alois Riehl to Wundt, 12 December 1888, UAL, Wundt Nachlass, Nr. 1384; on chances for Halle: Alois Riehl to Wundt, 7 October 1889, UAL, Wundt Nachlass, Nr. 1386.

² M. Schanz to Wundt, 19 June 1888, UAL, Wundt Nachlass, Nr. 1453.

his chances for an opening in Giessen in 1883 were poor, because of opposition there to "philosophy of the Wundtian direction."³

That attitude in Giessen seems to have been the exception, especially toward the end of the 1880s. Wundt began to influence academic appointments in all the German-speaking universities. This influence, however, was generally weaker in Prussia than elsewhere. For one reason, the central administration often made personnel and funding decisions that were made by faculties in the non-Prussian universities. In addition, Wundt's refusal of the professorship in Breslau, which had attained him support for the Leipzig Institute, may have cost him influence in the half of the universities in the German Empire that also lay in Prussian territory. None of his doctoral students, and only a few of his close colleagues, attained positions in Prussian universities before 1905, and decisions by Prussian academic administrators would continue to hinder Wundt's efforts to promote the development of experimental psychology in German academia as a whole.

Although Wundt's identity as philosopher was complicated--as was psychology's identity as a discipline--his following grew throughout Germany. That following was also affected by those complications: some of his most influential supporters were not philosophers; some others who were worked in Prussian universities.

B. The German *Herren Doktoren* in the 1880s.

1. Kraepelin, an allied psychiatrist.

Although experimental psychology was part of philosophy, the most distinguished of the Germans who worked in his Institute in its early years was a young psychiatrist, Emil Kraepelin (1856-1926). He became interested in Wundt's work about the time he received his medical degree in Leipzig in 1878. From Munich he wrote Wundt of his wish to join the new Institute, and they collaborated on the beginning of Wundt's journal, *Philosophische Studien*. Wundt, however, advised Kraepelin not to leave the field of psychiatry. When Kraepelin came back to Leipzig he experimented occasionally with Wundt but habilitated with the neuropathologist, Paul Flechsig.⁴

³ Richard Avenarius to Wundt, 22 February 1883, UAL, Wundt Nachlass, Nr. 1023.

⁴ Werner Fischel, "Wilhelm Wundt and Emil Kraepelin, Gedanken über einen Briefwechsel," in *Karl-Marx-*

In Leipzig from 1882 to 1886, Kraepelin used Wundt's experimental method to test the effects of alcohol, morphine and other substances on mental processes, particularly reaction time. In 1883 he published his *Compendium der Psychiatrie*, which introduced the nosology of mental disorders, e.g., the distinction between neurosis and psychosis, which became a basis of modern psychiatry. This important book went into several enlarged editions during Kraepelin's lifetime.

Attracted by the notion that experimental investigations would help to distinguish normal and pathological mental states, Kraepelin kept up his contact with the work in Wundt's laboratory. He was the first paid contributor to the *Philosophische Studien*, not counting Wundt, and he contributed a total of seven articles to the journal. Besides his study of the effects of drugs on simple reactions, these included critical studies on psychophysical methods. After Kraepelin left Leipzig for Dorpat in the Russian Empire, he helped two of his students publish papers in Wundt's journal.⁵ He continued laboratory research at Dorpat (1886-1890), Heidelberg (1890-1904), and Munich (1904-1926).

Kraepelin began his own journal in 1896, published by Wundt's publisher, Engelmann Verlag, and named *Psychologische Arbeiten*. Kraepelin's journal featured, as the title of his lead article specified, "The psychological experiment in psychiatry."⁶ By this time no one considered him a promoter experimental psychology; he had a cause of his own, modern psychiatry. Wundt's own medical training and his career in physiology had been set in Heidelberg. Kraepelin was there more than twenty years later, and the environment for psychology was still very medical. Even with Ludwig's Physiological Institute, Flechsig's *Nervenlinik* and other medical facilities nearby in Leipzig, psychology there was essentially philosophical and occasionally pedagogical. Kraepelin's interests were exceptional for Leipzig psychology. Had he stayed with Wundt, experimental psychology there may not have kept such a focus on normal psychology.

Universität Leipzig 1409-1959. Beiträge zur Universitätsgeschichte, ed. Ernst Engelberg et al (Leipzig: Verlag Enzyklopädie, 1959), 382-391. Biographical data can be found in Wilhelm Wirth, "Nachruf für Emil Kraepelin," *Archiv für die gesamte Psychologie*, 58 (1927), 1-32; and Emil Kraepelin, *Lebenserinnerungen*, ed. H. Hippus, G. Peters, and D. Ploog (Berlin: Springer-Verlag, 1983).

⁵ Friedrich Heerwagen, "Statistische Untersuchungen über Träume und Schlaf," *Philosophische Studien*, 5 (1889), 301-320. Henrich Higier, "Experimentelle Prüfung der psychophysischen Methoden im Bereiche des Raumsinnes der Netzhaut," *Philosophische Studien*, 7 (1892), 232-297.

⁶ Emil Kraepelin, "Der psychologische Versuch in der Psychiatrie," *Psychologische Arbeiten*, 1 (1896), 1-91. The series ended with the ninth volume in 1928, Kraepelin having died two years before.

2. Götz Martius, the problems of a Wundtian in Prussia.

Another German, who came early to Wundt with doctorate already in hand, was Götz Martius (1853-1927). Although he later fell into obscurity,⁷ Martius was a significant personality in early experimental psychology, because he was an early champion of Wundt's program for psychological research. He also introduced several others to the field, some of whom became important figures in German psychology. In the development of psychology in Germany, Martius was a kind of test probe of Wundtian psychology in Prussia.

Martius took his doctoral degree in philosophy in Bonn in 1877 then spent several years working as a school teacher and tutor. The financial circumstances of his marriage made it possible for him to return to Bonn University, where he habilitated in philosophy in 1885. In 1887 he took a semester's leave to go work in Wundt's Institute. He returned to Bonn with a set of Leipzig instruments and planned, with his friend and colleague Theodor Lipps, to start a laboratory.

In his letters to Wundt, Martius described the difficulties he faced in setting up this facility:

I want to tell you about steps taken, and their effect, in the interest of experimental psychology here. Unfortunately I cannot yet report anything very encouraging about it. In Berlin I experienced total rejection, although primarily upon the grounds that they could not give such backing to a Privatdozent. Geheimrat Althoff nevertheless showed interest in the matter, indicating that philosophy in Bonn was in a completely stagnant condition, and he made it clear that he would be very glad if something could be started *without* official support from the administration.

When I returned here, the custodian was still on vacation. I was first able to speak with him just a few days ago and to ask him to assign me a suitable space. He did not categorically refuse, but he told me that he doubted if such a room was available. There would be some new rooms, but only sometime during the next semester, and then the Department of Hygiene, which had long petitioned for a room, would have priority.

So it does not look very good for this winter. I am now in the process of making an official request to the faculty and the *Curatorium*. In the faculty, Prof. Meyer is quite interested, particularly on behalf of his future son-in-law, my friend Lipps. Lipps is very anxious to take part; he has for a long time been seeking the opportunity to learn about experimental work, in accordance with his interests. It is also advantageous that the stigma is less when it is a Privatdozent who wants to undertake such a new thing. I also hope that other faculty members will show some interest--particularly Schönfeld, who is rector now. I also want to try Pflüger, since his views have a lot of influence, even though he is very difficult to approach personally. I am still hoping for a successful final result.

⁷ Histories of psychology seldom even mention him. His passing was noticed in the literature, appropriately enough, only by Wundt's faithful assistant in the post-1900 period: Wilhelm Wirth, "Götz Martius," *Archiv für die gesamte Psychologie*, 61 (1928), 513.

[... andererseits wollte ich Ihnen gern gleich von den Schritten u. deren Wirkung Mitteilung machen, die ich im Interesse der experiment. Psychologie an hiesiger Universität unternommen. Leider kann ich darüber noch nichts eigentlich Günstiges berichten. In Berlin erfuhr ich eine vollständige Abweisung, wenn auch hauptsächlich mit der Begründung, dass sie einem Privatdocenten keine Bewilligungen machen könnten. Geh.-Rat Althoff zeigte trotzdem Interesse an der Sache, meinte, die Philosophie sei in Bonn in gänzlich verschommenen [?] Zustand und gab zu verstehen, dass er sich sehr freuen würde, wenn ohne offizielle Mithilfe der Regierung irgend etwas hier zu Stande käme.

Als ich hierher zurückkehrte, war der Custos noch auf Reisen. Erst vor einigen Tage konnte ich ihm sprechen, um ihn um Überweisung eines geeigneten Raumes zu bitten. Er hat nicht principiell abgelehnt, aber [?], dass irgend ein geeigneter Raum vorhanden sei; es würde zwar neue Räume geschaffen werden, aber erst innerhalb des kommenden Semesters. Dann hätte aber noch die Hygiene, die schon lange ein Raum petitionirt, den Vorzug. Er wolle sehen, was sich denn für die Sache tun liesse.

Damit muss also für den Winter nicht zu [?]. Ich bin nun jetzt dabei, eine offizielle Eingabe an die Facultät und das Curatorium zu machen. In der Fakultät interessiert sich Prof. Meyer dafür, besonders im Interesse seines künftigen Schwiegersohns, meines Freundes Lipps. Dieser will sich sehr gern beteiligen; er hat schon lange nach Gelegenheit gesucht, aus eigener Anschauung die experim. Arbeiten kennen zu lernen. Das hat auch der Vorteil, dass das Odium wegfällt, wenn ein Privatdocent etwas derartig Neues einrichten will. Ich hoffe auch, dass noch andre Mitglieder der Fakultät sich für die Sache interessieren werden; besonders Schönfeld, der jetzt Rector ist. Mit Pflüger werde ich auch einen Versuch machen, da seine Ansicht grossen Einfluss hat, wenn er auch persönlich nicht als leicht zugänglich gilt. So hoffe ich denn noch auf einen schliesslichen Erfolg.]⁸

This was the first time someone who had worked with Wundt brought a request for a psychological laboratory to Friedrich Althoff (1839-1908), the powerful secretary in the Prussian Ministry for Religious, Educational, and Medical Affairs who directed university matters from 1882 to 1907.⁹ G.E. Müller and Hermann Ebbinghaus had just gotten modest support for experimental psychology in Göttingen and Berlin. Althoff was, however, reluctant to give support to any psychological laboratory except, eventually, to the one in Berlin. In line with Martius's impression, though, Althoff often encouraged young philosophers to undertake such efforts themselves, as long as the Ministry did not have to make commitments.

Martius probably began working with his apparatus at his own home in Bonn. He had his first experimental study ready for Wundt's journal in 1889,¹⁰ and soon Martius's plans for a laboratory at

⁸ Götz Martius to Wundt, 16 October 1887, UAL, Wundt Nachlass, Nr. 1312.

⁹ For a favorable account, see Arnold Sachse, *Friedrich Althoff und sein Werk* (Berlin: Mittler, 1928); For a more balanced discussion of the famous Prussian bureaucrat see the historical novel by Russell McCormack, *Night thoughts of a classical physicist* (Cambridge, MA: Harvard U. Press, 1982).

¹⁰ Götz Martius to Wundt, 30 April 1889, UAL, Wundt Nachlass, Nr. 1313. His article, a psychophysical study, was "Über die scheinbare Grösse der Gegenstände und ihre Beziehung zur Grösse der Netzhautbilder," *Philosophische Studien*, 5 (1889), 601-617.

Bonn University came into fruition, and in a most interesting way:

Finally I can give you the happy news, which by a coincidence came about easily, even though at first there were great difficulties. We have gotten rooms for psychological-experimental research. The position vacated by the death of Clausius fell to Prof. Hertz, the discoverer of the wave-like propagation of electricity and the equivalence of electrical and light motion. For purposes of his experimental physics he has the use of very extensive rooms (the entire Clausius complex), which he cannot at all fully employ at this time and probably will not be able to use for years to come. With great alacrity he made available to us (I mean Lipps and me) two large rooms, although with the stipulation that if the Physical Institute should need them, we would give them back.

[Endlich kann ich Ihnen die erfreuliche Mitteilung machen, dass durch einen Zufall ganz leicht geglückt ist, was zuerst so grosse Schwierigkeiten hatte; wir haben Räume für psychologische-experimentelle Arbeiten erhalten. Die durch Clausius Tod erledigte Stelle hat Prof. Herz bekommen, der Entdecker der wellenartigen Fortpflanzung der Elektrizität u. Gleichartigkeit der elektrischen u. [?] Lichtbewegung. Er hat für die Zwecke der Experimentalphysik sehr ausgedehnte Räume zur Verfügung (die ganze Clausius'sche Amtsanhang), die er zur Zeit gar nicht genügend verwenden kann und auch auf Jahre hinaus nicht sie restlich wird ausnutzen können. Mit der grössten Bereitwilligkeit hat er uns (d. h. Lipps und mir) zwei grosse Zimmer eingeräumt, wenn auch mit dem Vorbehalt, dass sie bei entstandendem Bedarf seitens des physikalischen Instituts zurückgegeben werden müssen.]

Martius noted that the laboratory space came at an opportune time. He was eager to go into the fray and challenge Münsterberg's experiments which undermined the essential distinction between muscular and sensorial reactions and, by extension, Wundt's theory of mental processes. First, though, Martius made sure he was not usurping Leipzig territory:

I would like very much to know whether someone in Leipzig is undertaking this work, or whether you, honored Herr Geheimrat, intend to give this work to someone. In that case I would turn to something else.

[Es wäre mir lieb zu erfahren, ob in Leipzig bei Ihnen Jemand mit einer gleichen Arbeit beschäftigt ist, oder ob Sie, hochverehrter Herr Geheimrat, die Absicht hatten, Jemand mit diese Arbeit zu betreuen. Ich würde mich dann auf etwas Anders einrichten.]¹¹

Münsterberg had recently taken his doctorate with Wundt, so Wundt was reluctant to criticize these experiments himself. Martius volunteered his services. When Martius's study appeared in *Philosophische Studien*, Wundt also contributed a critical review of the general concepts behind the work of Münsterberg, Carl Lange, and others who rejected his doctrine of the central origin of feelings and emotions.¹²

Martius began his forthright defense of Wundt by reviewing Ludwig Lange's study of simple

¹¹ Götz Martius to Wundt, 23 May 1889, UAL, Wundt Nachlass, Nr. 1314.

¹² Wundt, "Zur Lehre von den Gemüthbewegungen," *Philosophische Studien*, 6 (1891), 335-393.

reactions. He emphasized his competence in this work by noting that he had assisted Lange with the experiments in Leipzig.

Then Martius reviewed Münsterberg's first issue of *Beiträge der experimentellen Psychologie*. Experiments presented there showed that some individuals, when doing more complicated discrimination and choice reactions, took longer in the muscular mode than in the sensorial. Wundt had insisted that complex reactions were possible only in the sensorial mode. In his theory of mental processes, a muscular reaction could not involve complicated discrimination or choice, because apperception and will (the psychophysical phases of the process during which discrimination and choice occur) are short-circuited in the muscular reaction. Münsterberg broke down the sensory-muscular distinction because he wanted to show that there was "no clear boundary between psychophysical and physical processes; multiple choice reactions can be brain reflexes too" [dass es eine Grenze zwischen psychologischen und bloß psychischen Prozessen nicht gibt, die complicirten Wahlbewegung eben auch lediglich Gehirnreflexe sind].¹³

One of Münsterberg's choice experiments called for movement of each of the five fingers according to a different stimulus, e.g. numbers one through five, five grammatical cases, five professional occupations. Subjects did muscular reactions (directing attention to finger movement) and then sensorial reactions (directing attention to the spoken stimulus). Münsterberg found that the muscular reaction could take longer. Martius admitted that this was an occasional result, though he could not confirm the regular, large differences which Münsterberg reported.

The problem, Martius contended, was that the reactions under study were not muscular reactions of the type specified by L. Lange and Wundt. The direction of attention (preparing the apperception) is not simply toward one movement. There are five, and there cannot (so the Wundtians argued) be five separate ideas in the focus of consciousness at one time. Secondly, in Münsterberg's "muscular" reactions, attention is actually not directed toward the movement, but rather toward the coordination of the category and the movement. Such a complicated process must involve apperception and cannot short-

¹³ Münsterberg, quoted in Götz Martius, "Über die muskuläre Reaction und die Aufmerksamkeit," *Philosophische Studien*, 6 (1891), 167-216; 168.

circuit it. Martius showed that Münsterberg's unambiguous results could be obtained by doing the muscular reactions first, and then the sensorial reactions, with the subjects thus more practiced.

At this opportune point in his criticism of Münsterberg, Martius explained the Wundtian methodology for psychological experimentation.

Another remark, valid for all psychological experiments, should not be suppressed. Münsterberg simply sat at his clock and took readings while running the experiments. That is a mistake which will be detrimental anywhere in experimental psychology. Psychology, also experimental psychology, is based on inner observation [innere Beobachtung]. Even the measurement of mental processes cannot be carried out without the help of inner experience [innere Erfahrung], which alone can control what process is to be measured. Someone who just brings in other persons and makes observations on them has no certainty whatever that the processes being measured are those which he ordered or those which he desires. Only by doing the reaction himself can he have this assurance. This is valid everywhere in psychology, but particularly in subtle processes like those of psychometry; it is more important with complex reactions than with the simple ones. If self-observation [Selbstbeobachtung], or inner experience [innere Erfahrung] does not remain the decisive factor in psychology, then the door will be opened to the most extravagant fancies. Without the constant restriction and supervision by inner experience, experimental psychology would do more harm than good. The dependability of inner experience proves itself time and again; on it alone rests the future of scientific psychology.

[Noch eine andere Bemerkung möge nicht unterdrückt werden, die für alle psychologischen Experimente gilt. Mg. hat bei der Ausführung seiner Versuche nur an der Uhr gesessen und registriert, andere haben reagiert. Das ist ein Fehler, der in der experimentellen Psychologie überall verhängnisvoll werden muss. Psychologie, auch experimentelle Psychologie, beruht auf innerer Beobachtung. Auch die Zeitmessungen psychischer Vorgänge lassen sich nicht ausführen ohne Mithilfe der inneren Erfahrung, die allein den zu messenden Vorgang kontrollieren kann. Wer nur andere Personen für die Ausführung der eigentlichen Beobachtung heranzieht, hat gar keine Sicherheit, ob die Vorgänge, die gemessen werden, derart sind, wie er sie vorgeschrieben oder wie er sie wünscht. Nur die eigene Ausführung kann diese Sicherheit geben. Es gilt dies überall in der Psychologie, zumal aber bei so subtilen Vorgängen, wie die es sind, mit denen die Psychometrie zu thun hat, es gilt mehr noch bei zusammengesetzten Reactionen, als bei einfachen. Bleibt nicht die Selbstbeobachtung, die innere Erfahrung das den Ausschlag gebende Moment in der Psychologie, so wird den ausschweifendsten Phantasmen Thür und Thor geöffnet sein. Die experimentelle Psychologie würde ohne die forwährende Beschränkung und Beaufsichtigung durch die innere Erfahrung mehr Schaden als Nutzen stiften. Die zuverlässigkeit der inneren Erfahrung bewährt sich immer mehr und mehr, nur auf ihr beruht die weitere Zukunft der wissenschaftliche Psychologie.¹⁴

The reaction-time experiment functioned as the medium for controversies in experimental psychology, making possible quantitative investigations of mental processes and, more importantly, giving a common basis for comparing very different theoretical approaches to their explanation. Martius emphasized the social arrangement of Wundt's psychological experiment and attributed Münsterberg's "misleading"

¹⁴ *Ibid.*, 178.

results to his failure to adhere to that arrangement.

Besides Martius and Lipps, at least one other prominent psychologist began his research career in Martius's laboratory in Bonn. Karl Marbe (1869-1953) studied in Freiburg and became acquainted with Münsterberg's work, but it was Martius who really attracted him to psychology. Marbe recalled his arrival in Bonn during summer-semester 1890: "At that time Martius was making all sorts of reaction experiments, in which I helped him, and which increased my interest in modern psychology."¹⁵ Marbe spent additional semesters with Martius, but eventually fell into disagreement with both Martius and Wundt. Ironically, Marbe was one the Germans who developed applied psychology, more of a Münsterberg than a Martius, as it turned out.

In 1893 Martius was appointed Extraordinarius in philosophy at Bonn. He no longer published in Wundt's journal; instead he contracted with Wundt's publisher Engelmann to begin a journal to report his work and that of his students. He named it *Contributions to psychology and philosophy* [*Beiträge zur Psychologie und Philosophie*]. Martius managed to produce only one volume between 1896 and 1905: eleven lengthy articles (including a manifesto-like introduction), all but four of them written by Martius himself. The last three articles were based on research carried out in Kiel. Martius had been called to a full professorship there in 1898 and started an institute the next year.

In observing Martius's effort to promote experimental psychology, Wundt formed many of his opinions about Prussian academic politics. His friend's failure to get funding and a professorship in Bonn increased Wundt's dislike of Secretary Althoff. Things were better for Martius in Kiel. The Wundts often vacationed in that city--Sophie Mau Wundt's family home was there--and Wundt had opportunities for conversations with Martius about psychology, philosophy, and Prussia bureaucracy.

After having produced a dozen studies in experimental psychology between 1889 and 1905, Martius stopped publishing his writings. In his autobiography, written late in his life, he explained that he became disillusioned with Wundt's program for psychophysical investigation of subjective processes, and he admitted that his university lectures and not his publications gave the best account of his philo-

¹⁵ "Karl Marbe," in *A history of psychology in autobiography*, ed. Carl Murchison (Worcester, MA: Clark U. Press, 1936), vol. 3, 181-213; 188.

sophical views.¹⁶ Perhaps Martius identified too closely with Wundt early on and neglected to make his own way in philosophy. That was never true of his old colleague in Bonn.

3. Theodor Lipps, a curious sort of ally.

Theodor Lipps (1851-1914) taught in Bonn and Breslau before spending the major part of his career at Munich. Although he never worked in the Leipzig Institute for Experimental Psychology, and although he could hardly be called an experimentalist himself, it is appropriate to include him here as an early Wundt ally in Germany. Lipps was quite a different sort of psychologist than was Wundt, and their friendship may have been based more on personal connections and mutual admiration than on common intellectual ground.

Lipps had studied philosophy in Bonn and habilitated in 1877. His first important book, *Grundtatsachen des Seelenlebens*, made an extensive survey of experimental psychology as it stood in 1883. The next year Lipps became Extraordinarius in philosophy at Bonn. He supported Martius in setting up the psychological laboratory at Bonn, and also participated in the experiments there.

In 1890 Lipps was called to the "Protestant Ordinarius" in philosophy at Breslau University, in the Prussian border area which is now part of Poland. Philosophy there boasted a Protestant chair, a Catholic chair, and for a while also a Jewish chair in the person of Jacob Freudenthal (1839-1907), an important Spinoza scholar. Lipps's position obligated him to establish and supervise a "psychophysical collection" [psychophysische Sammlung]. His predecessor, Benno Erdmann, had been getting small grants for psychological instruments since 1885, but had taken the equipment with him to Halle. With this financial support for apparatus, and probably also with some technical advice from Martius in Bonn, Lipps had demonstrations for his psychology lectures.

The career of experimental psychology at Breslau indicates the vicissitudes of official Prussian interest in the new field. When Wilhelm Dilthey held the chair of philosophy there from 1871-1883, he lectured in psychology, and his interest in the experimental approach is evident in his letter recommending Wundt as his replacement.¹⁷ Coming from Kiel, and with a primary interest in Kant, Erdmann took

¹⁶ "Götz Martius," in Raymund Schmidt, ed., *Die Philosophie der Gegenwart in Selbstdarstellungen*, 3 (Leipzig: Felix Meiner, 1922), 99-120.

¹⁷ Wilhelm Dilthey to Friedrich Althoff, 29 March 1883, Zentrales Staatsarchiv Merseburg, Signatur: Rep 92

up experimental psychology in Breslau, perhaps influenced by the fact that Wundt was been the faculty's first choice. Lipps kept up the interest in psychology during the few years he was there; then his successor, Hermann Ebbinghaus, tried to make Breslau into a major center for psychological research. Ebbinghaus's plans were not fulfilled, partly due to Dilthey's change of heart concerning psychology, as the next chapter explains.

Lipps went to Munich in 1894 and became an important teacher of philosophy there. As a psychologist, Lipps represented an intellectual middle position, a well-respected man from all sides. For example, he was on the editorial board of Ebbinghaus's *Zeitschrift für Psychologie und Philosophie der Sinnesorgane*; yet when Meumann started the *Archiv für die gesamte Psychologie*, an obvious competitor, Wundt persuaded him to include Lipps on that editorial board also, even though Meumann was critical of the views of the "Lippsianer."¹⁸

Wundt and Theodor Lipps were connected not only through their mutual friend Martius, but also through Lipps's younger half-brother, Gottlob Friedrich Lipps (1865-1931).¹⁹ The younger Lipps was one of those mathematics students who came to Wundt's Institute during its first decade. He took the doctorate with Wundt in 1887, then, true to the formula, he worked for many years as a teacher of mathematics in the *Gymnasia* in Leipzig. Unlike most of the other teachers, G.F. Lipps kept in contact with Wundt's Institute. He gained a reputation as a scholar by editing Fechner's unfinished statistical project, the *Kollektivmasslehre*.²⁰ In 1904, G. F. Lipps became Privatdozent in Leipzig, then Extraordinarius in 1907. In 1911 he was made professor of philosophy in Zürich, where he stayed until his retirement in 1930. Of course, he never became a psychologist with a large following, like his master Wundt or his half-brother Theodor.

Theodor Lipps's writings were on the "periphery of the 'new' psychology," according to Boring; he was not really an experimental psychologist but one "infected by the spirit of the times." His main

Althoff, B Nr 29 Bd 2, Bl. 109a-100b.

¹⁸ Wundt to Ernst Meumann, 5 June 1903, UAL, Wundt Nachlass, Nr. 716a. Ernst Meumann to Wundt, 14 August 1905, UAL, Wundt Nachlass, Nr. 728.

¹⁹ "Theodor Lipps," *Neue Deutsche Biographie*.

²⁰ Gustav Theodor Fechner, *Kollektivmasslehre*, ed. Gottlob Friedrich Lipps im Auftrag der Königlich sächsischen Gesellschaft der Wissenschaften (Leipzig: Engelmann, 1897).

works, besides *Grundtatsachen des Seelenlebens*, were on logic, aesthetics, and the typically Lippsian theory of illusions.

Lipps is, of course, best known for his theory of empathy [Einfühlung], the theory that a perceiving subject projects himself into the object of perception. He perceives the huge object as pressing down, the bridge span as straining or in tension, the arrow as moving or striving forward. Lipps's theory of esthetic feeling is based on empathy...²¹

Contrasting styles are evident in a comparison of the long treatises on optical illusions published by Wundt and T. Lipps in the late 1890s. Lippsian empathy theory held that indications of strains or motions in certain figures led, by the subject's identification with the figure, to perceptual distortion of actual shapes. Wundt explained the same illusions by positing certain preferred moments of eye movement.²² In essence, Lipps and Wundt agreed that the essential action was psychological, that is, directed by central mental processes. Although their styles differed, and although T. Lipps liked to discuss unconscious mental processes more than Wundt cared to, the two psychologists never entered into a debate in print, and Lipps was *Doktorvater* to three of Wundt's most important Institute Assistants in the period after 1900.

C. A first score in Germany: Külpe as professor in Würzburg, 1894-1909.

1. Attaining the professorship.

Oswald Külpe (1862-1915) was the first of Wundt's doctoral students to become full professor in a German university. Born in a German community in Russian-controlled Courland, Latvia, he entered the University of Leipzig in 1881 with plans to study history. Wundt's lectures deflected his attention to philosophy and psychology already in the first semester, but he continued his tour of German universities: a semester in Berlin to study history; three semesters in Göttingen, where he began a survey of theories of sensory feeling with G.E. Müller; a year at Dorpat; then the return to Leipzig in 1886. In 1887 Külpe submitted to Wundt his dissertation based on the work begun in Göttingen. It was published, not in Wundt's journal, but in Avenarius's *Vierteljahrsschrift für wissenschaftliche Philosophie*.²³

²¹ Boring, 426, 455.

²² Theodor Lipps, *Raumästhetik und geometrisch-optische Täuschungen* (*Gesellschaft für psychologische Forschung. Schriften. Heft 9/10*) (Leipzig: Barth, 1897); Wundt, "Die geometrisch-optische Täuschungen," *Abhandlungen der Königlich sächsischen Gesellschaft der Wissenschaften, mathematisch-physische Klasse*, 24 (1898), 55-178.

²³ Oswald Külpe, "Zur Theorie der sinnlichen Gefühle," *Vierteljahrsschrift für wissenschaftliche Philosophie*, 11

This may be an early clue of Külpe's affinity with G.E. Müller and Avenarius, which later brought him into disagreement with Wundt.

Also in 1887, Külpe became Wundt's third Institute Assistant, following Cattell and Ludwig Lange. In 1888 he habilitated with an essay which surveyed theories of will and generally defended Wundt's conception against that represented in Münsterberg's Freiburg habilitation of the same year.²⁴ At Leipzig Külpe lectured on philosophy, including psychology, and served as Institute Assistant for seven years. In 1893 he published a general textbook on psychology, *Grundriss der Psychologie*, and advanced to the faculty rank of Extraordinarius. Then, after nearly twenty years at Leipzig, Wundt finally saw one of his doctoral students become Ordinarius in philosophy at a German university.

Wundt helped advance Külpe's candidacy for that position. He had recommended Theodor Lipps for the Würzburg professorship in 1888, but the chair had gone instead to Johannes Volkelt. This turned out to be no total loss for Wundt. He and Volkelt knew each other and corresponded, and Volkelt published one of the major, friendly reviews of Wundt's *System der Philosophie* (1889), the book that developed Wundt's most general philosophical positions.²⁵ In 1893 Hermann Masius, Leipzig's professor of pedagogy, died. At that time there was an acute glut of secondary school teachers in most parts of Germany, so the Philosophical Faculty decided to convert this chair in pedagogy to one for "philosophy and pedagogy."²⁶ Wundt asked Volkelt to take the position. Simultaneously he tested the waters for Külpe to replace Volkelt at Würzburg.

Volkelt was at first reluctant to accept the Leipzig job. His main interest was aesthetics, and he was suspicious, in spite of the adjustment in title, that the burdens of teacher training would leave him little time to devote to philosophy.²⁷ Wundt managed to reassure the candidate on that matter, and

(1887), 424-482; *JZ* (1888), 50-80.

²⁴ Oswald Külpe, "Die Lehre vom Willen in der neueren Psychologie," *Philosophische Studien*, 4 (1888), 179-244, 381-446.

²⁵ Johannes Volkelt, "Wilhelm Wundts 'System der Philosophie'," *Philosophische Monatshefte*, 27 (1891), 257-289, 409-430, 527-546.

²⁶ Franz Eulenberg, *Die Entwicklung der Universität Leipzig in den letzten hundert Jahren. Statistische Untersuchungen* (Leipzig: S. Hirzel, 1909), 119; Johannes Volkelt, "Das philologisch-pädagogische und praktisch-pädagogische Seminar," *Festschrift zur Feier des 500-jährigen Bestehens der Universität Leipzig. Bd. 4. Die Institute und Seminare der philosophischen Fakultät an der Universität Leipzig* (Leipzig: Rektor u. Senat der Universität, 1909), 137-138; Fritz K. Ringer, *Education and society in modern Europe* (Bloomington and London: Indiana U. Press, 1979), 53.

²⁷ Johannes Volkelt to Wundt, 28 December 1893, UAL, Wundt Nachlass, Nr. 1526.

Volkelt agreed to use his advisory position on the search committee in Würzburg on Külpe's behalf. He added, "What is most needed here is a good lecturer."²⁸

Külpe had lectured successfully at Leipzig, and with backing from Volkelt and Wundt, he was made professor at Würzburg. He spent the longest and most productive period of his career there. One of his major accomplishments was the establishment of Würzburg's Psychological Institute.

2. Getting an institute in Würzburg.

Külpe did not find immediate support for experimental research in Würzburg. In fact, for a while he had problems fitting into the university at all. Külpe was aware that except for its sizable medical program, Würzburg was a small university. Moreover, the turnout for his courses was disappointing him. In his first semester there, forty-one students paid the enrollment fee for his history of philosophy course, but only about seven of those actually attended the lectures. Külpe was sure that ultramontane forces in Würzburg had targeted him for academic destruction; these Catholic conservatives opposed modern experimental psychology as something harmful to the faith. In his second semester there, Külpe informed Wundt that he was looking for the opportunity to escape the stifling Bavarian environment.²⁹

Business picked up for Külpe by his third semester, and Wundt congratulated him in a Christmas greeting: "...now that the ice has been broken, this success will bring good things in the future. [...nachdem einmal das Eis gebrochen ist, auch in der Zukunft nachwirken wird.]"³⁰ In 1896, his third year at Würzburg, Külpe opened the Psychological Institute with support of year-to-year grants of only 280 marks, which barely covered cleaning, lighting, and heating.³¹ Wundt opened the *Philosophische Studien* to publication of research by Külpe's students.³²

²⁸ Johannes Volkelt to Wundt, 1 January 1894, UAL, Wundt Nachlass, Nr. 1527.

²⁹ Külpe to Wundt, 30 June 1895, UAL, Wundt Nachlass, Nr. 386.

³⁰ Wundt to Külpe, 25 December 1895, UAL, Wundt Nachlass, Nr. 391.

³¹ Karl Marbe, "Das psychologische Institut der Universität Würzburg," *Fortschritte der Psychologie und ihrer Anwendungen*, 2 (1914), 302-320; 304.

³² These five articles were introduced with the words "Aus dem psychologischen Institut der Universität Würzburg": Karl Marbe, "Neue Versuche über intermittierende Gesichtsstreize," 13 (1898), 106-115; and "Die stroboskopischen Erscheinungen," 14 (1899), 376-401; Ernst Dürr, "Ueber die stroboskopischen Erscheinungen," 15 (1900), 501-523; Wilhelm Ament, "Ueber das Verhältnis der ebenmerklichen Unterschieden bei Licht- und Schallintensitäten," 16 (1902), 135-196; Frank S. Wrinch, "Ueber das Verhältnis der ebenmerklichen zu den übermerklichen Unterschieden im Gebiet des Zeitsinnes," 18 (1903), 274-327.

Wundt tried to play down the threat from the ultramontanes and to encourage Külpe in his efforts to obtain research support:

The enrollment numbers give admittedly only superficial, but also certainly objective testimony that your efforts are gradually overcoming the so-to-speak opposing powers, which are, of course, everywhere. And it seems to me that it should not be much longer until the granting of state funds gives official support to your institute and your work.

[Die Anzahl Ihrer Zuhörer ist ja zwar nur ein äusseres, aber doch auch ein objektives Zeugnis dafür, dass Sie sich mit Ihren Bestrebungen gegen die etwa widerstrebenden Kräfte, die es ja überall gibt, allmählich durchsetzen. Ich sollte meinen, da könnte auch eine offizielle Förderung Ihres Instituts und Ihrer Arbeiten durch die Bewilligung von Staatsmitteln nicht mehr lange auf sich warten lassen.]³³

Külpe continued to lobby for a regular budget for his institute. Wundt sent greetings at New Year's, 1898:

Your portrayal of Würzburg shows a mixture of light and shadow. But of course that's the way life is; and it is good to know that you are not entirely immune from the occasional pessimistic attitude. But in order to strengthen your optimism I have these wishes for you: that Hertling³⁴ becomes Bavarian Minister of Public Worship and Education, that he names your closest colleague his successor; and then, in order to prove his own scientific independence, he endows the Würzburg Psychological Institute as richly as possible.

[In Ihrer Schilderung aus Würzburg sind ja Licht und Schatten gemischt. Aber das ist nun einmal überall so im Leben und es freut mich zu erfahren, dass Sie im allgemeinen nicht ganz von pessimistischen Anwendungen frei sind. So möchte ich Ihnen denn, um Ihren Optimismus zu kräftigen, wünschen, dass Hertling bayrischer Cultusminister wird, Ihren nächsten Collegen zu seinem Nachfolger ernennet und das Würzburger psychologische Institut, um seine eigene wissenschaftliche Unabhängigkeit zu beweisen, so reich wie möglich mit Mitteln ausstattet!]³⁵

A year later, Külpe was getting a look at university administration from the inside. He complained about the burden of serving as dean of the Philosophical Faculty, but Wundt advised him to use academic office to his advantage--and psychology's:

I know what you mean when you say that it is upsetting to be overloaded with duties of office. But it also has its advantages--for example, perhaps a regular annual budget for you. In the eyes of a minister--and this is just the way the bureaucratic mind works--the request of a dean always carries more weight than that of a plain professor. And after all, academic offices have the pleasant characteristic that they last only a short time. Indeed one never has such a full feeling of academic freedom as when he has happily rid himself of such an office.

³³ Wundt to Külpe, 28 December 1897, UAL, Wundt Nachlass, Nr. 392.

³⁴ Georg Graf von Hertling (1843-1919), professor of philosophy at Munich, a leader of the Catholic Center Party, later Bavarian prime minister and Imperial Chancellor. See "Wilhelm Wirth," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1936), 283-327; 285.

³⁵ Wundt to Külpe, 1 January 1899, UAL, Wundt Nachlass, Nr. 395.

[Dass Ihnen die Überhäufung mit Amtsgeschäften vielfach störend ist, weiss ich wohl zu würdigen. Aber sie gehören nun einmal zum akademischen Leben. Auch bringen sie manches Gute mit sich,--so z.B. für Sie vielleicht einen regelmässigen Jahresetat. In den Augen eines Ministers hat, wie nun einmal die bürokratischen Anschauung beschaffen sind, die Forderung eines Dekans immer ein etwas grösseres Gewicht als die eines schlechthinigen Professors. Und schliesslich haben alle akademischen Amter die glückliche Eigenschaft, dass sie kurz dauern, und dass man sich nie so sehr im Vollgefühl seiner akademischen Freiheit fühlt, als wenn man ein solches Amt wieder glücklich los ist.]³⁶

Wundt was speaking from experience here. His first application for funds for an experimental seminar had been refused in 1879. As dean in 1881-82, his letter could at least get him year-to-year grants, until the call to Breslau in 1883 enabled him to bargain for permanent budgetting. Wundt's greetings for the new year, 1902, again included the wish that the coming year would "see the endless provisional status of your institute change to a permanent one" [das endlose Provisorium Ihres Instituts in ein Definitivum verwandeln].³⁷

The parallel between Külpe's and Wundt's experiences is striking. Both received a *Berufung* in their eighth year as professor, shortly after serving as dean. Whereas Wundt's job offer had come from a Prussian university, Külpe's came from the United States. Wundt wrote congratulations:

I first found out about your call to Leland Stanford through your letter. I am happy that this event at least resulted in the success of lasting and regular support for your institute. That much can be done with 500 marks, you know yourself from the early, meager times of the Leipzig Institute, whose income was not much greater.

[Von Ihrer Berufung nach Leland Stanford erfahre ich erst durch Ihren Brief. Erfreulich, dass dieses Ereignis wenigstens den Erfolg einer dauernden und regelmässigen Subvention Ihres Instituts zur Folge gehabt hat. Dass sich mit 500 M. schon Manches machen lässt, das wissen Sie selbst ja am besten aus den ersten knappen Zeiten des Leipziger Instituts, wo dessen Einkünfte nicht erheblich grösser waren.]³⁸

By agreeing to stay in Würzburg, Külpe attained a regular, if modest, 500-mark budget for his institute.

Külpe's useful but ultimately unrealistic job prospect at Stanford was soon followed by more attractive opportunities in Prussia. Külpe's move to a Prussian university did not come easily, as Chapter Eight will show. In Würzburg he continued to build his facilities and his following.

By 1902, Külpe had an Extraordinarius at his side doing psychological experiments: Karl Marbe, who had trained with Münsterberg, Martius and Wundt, as well as with Külpe.³⁹ In addition to getting

³⁶ Wundt to Külpe, 3 January 1900, UAL, Wundt Nachlass, Nr. 397.

³⁷ Wundt to Külpe, 29 December 1901, UAL, Wundt Nachlass, Nr. 400.

³⁸ Wundt to Külpe, 28 December 1903, UAL, Wundt Nachlass, Nr. 402.

³⁹ Marbe came as emergency replacement when the professor of pedagogy retired. "Karl Marbe," *A history of*

the 500-mark budget in 1904, Külpe was also able to hire an institute assistant. The first one, Ernst Dürr, had been assistant to Wundt and was to become a psychologist of some prominence himself.

In 1906 finances improved markedly when the Institute received a "generous grant from a rich [female] disciple [eine grossherzige Stiftung einer reichen Schülerin]." This "Leopold Schweisch Stiftung" gave the Würzburg Institute 2000 marks annually starting in 1906, and the 500 marks from the university went to scholarships for students.⁴⁰ In 1914, a few years after Külpe left Würzburg, Institute Director Marbe reported that the Institute possessed sixteen rooms, seven of which were outfitted as laboratories.⁴¹

The Würzburg Institute, in spite of its steady growth, was always smaller than those in Leipzig, Göttingen, or Berlin. Külpe wrote mostly on general philosophy and aesthetics, yet he was recognized as a leader in experimental psychology.⁴² By 1906 his Institute was firmly established, and his students were turning out very original research--and drawing criticism from Wundt. Chapters Seven and Eight discuss the disagreements between Wundt and Külpe. Now we look at another success for experimental psychology: Meumann in Zürich.

D. Meumann conquers Zürich for experimental psychology, 1897-1905.

1. The problematic professorship in Zürich, 1896-97.

The next major *Berufung* out of the Leipzig Institute came four years after Külpe's, when Ernst Meumann was called to Wundt's old position in Zürich in 1897. Richard Avenarius died in 1896. The complications involved in finding his replacement reveal a competition of views in philosophy, a competition which Wundt's side won, in this particular case.

The original plan for filling the Avenarius chair was quite different from the result. Wundt and the Zürich faculty had originally intended for Münsterberg to have the position. Having just spent three

psychology in autobiography, ed., Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1936), 181-213; 201.

⁴⁰ Külpe to Wundt, 29 September 1905, UAL, Wundt Nachlass, Nr. 406.

⁴¹ Karl Marbe, "Das psychologische Institut," *op. cit.*, 312.

⁴² David Lindenfeld, "Oswald Külpe and the Würzburg School," *Journal for the history of the behavioral sciences*, 14 (1978), 132-141; R. M. Ogden, "Oswald Külpe and the Würzburg School," *American journal of psychology*, 64 (1951), 4-19.

very successful years at Harvard, Münsterberg took leave in 1895 to return to his position as Professor Extraordinarius at Freiburg. Harvard gave him two years to decide whether to stay in Germany or to commit to the American university. The trade-off between American money and opportunity and German familiarity and prestige made it a difficult decision, but the resolution of the Zürich professorship helped clinch Münsterberg's decision for Harvard.

Years after the event, the story circulated that Wundt and others had lobbied against Münsterberg's appointment in Zürich. The implications are that he was considered unsuitable for ideological or even religious reasons. For Wundt's part, at least, quite the opposite was true, as Wolfgang Bringmann and William Balance discovered in the Zürich archives. Shortly after the death of Avenarius, Wundt wrote a letter to the dean of the Philosophical Faculty strongly recommending Münsterberg, in spite of their disagreements in psychology.

Wundt's letter began stated that although currently "requests for a letter of recommendation in the field of philosophy are generally difficult to respond to," Münsterberg was the one person best suited for the job. There was some criticism:

I must note that the works of Münsterberg which have been available until the present time, have by no means met the expectations, which I had originally held regarding him, and that he has reaped for them, in part, enthusiastic support from others, and, in part, however, manifold, and, in my judgment, justified attacks.

Wundt then praised Münsterberg as an outstanding teacher and added a specific reason why he was the right person for Zürich.

Although I have not agreed with Münsterberg's works, I must add, insofar as this disagreement concerns principles, that these are the same points about which I have similarly differed with Avenarius. I believe, indeed, that if you want a psychologist, who represents psychology and generally also philosophy in the spirit of Avenarius, Münsterberg is the right candidate.⁴³

It was Wundt's understanding, as will become clear, that Zürich did want someone who would continue in the spirit of Avenarius.

Several months later, in the spring of 1897, the dean informed Wundt that the full professorship

⁴³ Wundt to Theodor Vetter, 14 September 1896, translated in Wolfgang G. Bringmann and William D. G. Balance, "Wundt vs Münsterberg. Roback's version challenged," *American psychologist*, 27 (1973), 849-850.

had been reduced to an Extraordinarius, leaving a single professorship in philosophy occupied by the aged Ludwig Kym. The faculty committee first suspected that the Ministry had done this because Münsterberg was nominated. (Did the dean mean that the Ministry was reluctant to hire a Jew outright as Ordinarius in philosophy? Perhaps a theological faction had objections to this.) Eventually the committee convinced itself that the grounds for lowering the position were, in fact, financial. It planned to recommend Münsterberg anyway and try to persuade him to take the job, noting that Kym's advanced age assured speedy promotion to the full chair. But Münsterberg, angry and frustrated, sent a letter to the Ministry threatening to publish a pamphlet denouncing its procedure as unethical.

So Münsterberg was lost as a candidate, and the committee could only regret that he lacked the patience to withstand the ordeal. The remaining candidates were Friedrich Carstanjen, the protégé of Avenarius, and Hans Cornelius, then Privatdozent at Munich. The latter was more experienced, but Theodore Lipps had indicated that his lecturing style was difficult [überscharf]. Carstanjen, though young, had been lecturing quite successfully in Zürich. The dean sought Wundt's opinion of those two candidates and asked him to suggest others. The job, essentially the one Wundt had once held, required lectures in psychology, general pedagogy, and possibly ethics. (These were, incidentally, the subtopics of philosophy most important in examinations for secondary-school teachers.) The dean admitted his dependence upon Wundt's advice more than that of anyone in Zürich--Kym had "antipathy toward any direction more modern than his own." The letter closed with regrets that Münsterberg's candidacy had come to such a bad end.⁴⁴

Wundt, however, proposed a third candidate: his Institute Assistant Ernst Meumann (1862-1915). Meumann had much in common with Külpe. Exact contemporaries, each had an impressive education, each became a prominent experimental psychologist, and both remained bachelors. The son of a Rhineland pastor, Meumann took the *Abitur* in Elberfeld and went to the university in 1883. He made a circuit through Tübingen, Berlin, Halle, and Bonn. After taking state exams in theology in 1887 and teachers' exams in 1889, Meumann disappointed his father by deciding not to become a pastor or teacher. Instead, he was influenced by a friend and medical student, Gustav Störking, to study science.

⁴⁴ Theodor Vetter to Wundt, 20 March 1897, UAL, Wundt Nachlass, Nr. 1519.

Störing obtained a medical degree, but Meumann did his doctoral dissertation with the philosopher Christopher Sigwart in Tübingen on the psychology of association.⁴⁵ Then he, and later Störing, went to habilitate in Leipzig with Wundt.

Meumann proved to be a very careful experimenter and an able defender of Wundt's viewpoint in psychology. He invented a new apparatus to study estimation of temporal intervals, including effects of rhythms and accents, and did experiments to refute Münsterberg's hypothesis that the temporal sense is simply derived from time taken by muscular movements in limbs, eyes, etc. Meumann's habilitation essay supported the premise of an immanent, psychic temporal sense [Zeitsinn].⁴⁶ Meumann's experiments were well executed and his arguments persuasive. He fast became Wundt's favorite, in the laboratory. Wundt made him *Privatassistent* in 1892, and then First Assistant when Külpe left for Würzburg two years later.

When the Zürich position opened, Wundt had good reason to want Meumann to stay in Leipzig. The Institute had just moved into its spacious new quarters in the renovated main university building, and there really was no obvious replacement for Meumann. The Zürich job, however, would benefit the young man's career. Upon Wundt's recommendation the Zürich faculty immediately sent Meumann a preliminary inquiry to see if he were disposed to take the job. Wundt wrote a long letter to Meumann to explain why he should be ready to accept the superficially unimpressive and recently troubled position.

The Extraordinarius in Zürich, Wundt explained, had higher status than in Germany. He was a full member of the faculty and could even be dean. The difference, besides the smaller salary, was the lesser teaching obligation, which actually might be desirable for Meumann at first. The next thing to consider was that this would be the first major step in an academic career--it would make Meumann a more presentable candidate [berufungsfähiger] for positions in German universities, particularly since Kym's advanced age assured that Meumann would soon be promoted to full professor. Finally, the

⁴⁵ Ernst Meumann, "Das Grundgesetz der Assoziation und Reproduktion der Vorstellungen," (unpublished, 1890). See Paul Müller, *Ernst Meumann als Begründer der experimentellen Pädagogik* (Dissertation, University of Zürich, 1942), 1-15.

⁴⁶ Ernst Meumann, "Beiträge zur Psychologie der Zeitsinn," *Philosophische Studien*, 8 (1893), 431-509; 9 (1894), 264-306; 12 (1896), 127-254.

change of climate and the beauty of Zürich should be good for Meumann's delicate constitution. Wundt repeatedly concerned himself with Meumann's health, recalling perhaps the fate of Ludwig Lange.

Wundt gave Meumann specific advice on how to handle the Zürich job. It would suffice, he said, to give one main lecture and then a smaller course of one or two hours. Meumann should avoid doing too much work on new lectures, especially on pedagogy. In the first semester, it would be enough to lecture psychology, then a two or three-hour course on pedagogy every few semesters.⁴⁷ Wundt thus advised Meumann to do almost exactly what he himself had done twenty-two years before in Zürich.

The educational ministry in Zürich did not act immediately on the faculty's recommendation of Meumann. A week later, Wundt wrote to Meumann concerning the hesitation. Wundt suspected that the in-house candidate, Carstanjen, had garnered support in the meantime and that the Avenarius philosophy still held sway in Zürich. Wundt's assessment here is consistent with his recommendation of Münsterberg the year before, and it reinforces the impression that he was sincere when he recommended the young psychologist with whom he differed so fundamentally. Meumann claimed he would be content to continue his experimental work in Leipzig, but Wundt still thought that the advancement in Meumann's career would be worth the disruption in his research.⁴⁸

Wundt, it turned out, was being overly pessimistic—his man had won the position. In October of 1897 Meumann started reporting from Zürich.⁴⁹ He did not follow every detail of his teacher's advice on handling the new position, but he succeeded in displacing the Avenarius disciples and making Zürich a stronghold for experimental psychology.

2. Meumann's Psychological Institute in Zürich, 1897-1905.

The establishment of the Psychological Institute in Zürich is particularly interesting, because Wundt cultivated Meumann with close attention and advice. Possibly Wundt was already thinking about who might be his successor in Leipzig. In 1897, when Meumann left Leipzig, Wundt was already 65 years old.

⁴⁷ Wundt to Meumann, 5 April 1897, UAL, Wundt Nachlass, Nr. 696.

⁴⁸ Wundt to Meumann, 12 April 1897, UAL, Wundt Nachlass, Nr. 697.

⁴⁹ Meumann to Wundt, 14 October 1897, UAL, Wundt Nachlass, Nr. 698.

Meumann had recently helped Wundt move the Leipzig Institute into its new quarters, and when he arrived in Zürich, he was anxious to recreate what he could of the fine working conditions he had known. Initial discussions with the dean of the Philosophical Faculty, however, were not hopeful on that score:

Of course I became acquainted with Prof. Vetter, who very kindly instructed me on all the necessary matters. And I learned, among other things, that the outlook for organizing a psychological institute is very poor. We cannot even think about a grant of money; and in the university building there is practically a battle for each square meter, so that I cannot even get a room to myself for a few hours each day. Finally I asked for a room in the Carcer [formerly, the university jail], and even that was not available. This is particularly distressing, since I bought quite an extensive set of apparatus during summer vacation, including a large part of the Zimmermann exhibition. Now the question arises: what to do with these treasures? Finally the rector gave me a cabinet and a lab table for experiments in my auditorium; these two "spaces" will constitute the beginning of the psychological institute in Zürich.

[Zwar machte ich mich mit H. Prof. Vetter bekannt, der mich sehr liebenswürdig über alles Notwendige unterrichtet hat. Da erfuhr ich unter Andern, dass für die Einrichtung eines psychologischen Instituts die Aussichten sehr schlecht stehen. An die Bewilligung von Geldmitteln ist gar nicht zu denken, und im Universitätsgebäude herrscht ein förmlicher Kampf um den Quadratmeter, so dass ich selbst nicht für einige Tagesstunden ein besonders Zimmer bekommen kann. Ich habe zuletzt versucht, mir ein Zimmer in Carcer auszubitten, aber das war erst recht nicht entbehrlich. Das ist mir um so peinlicher, als ich mir in den Ferien eine ziemlich umfangreiche Einrichtung besorgt habe, indem ich einen grossen Teil von Zimmermanns Ausstellungs-Apparaten angekauft habe. Nur erhebt sich die Frage, wo mit diesen Schätzen bleiben? Der Herr Rektor hat mir schliesslich für mein Auditorium einen Schrank und einen kleinen Experimentiertisch bewilligt und diese beiden "Räumlichkeiten" werden den Anfang des psychologischen Instituts zu Zürich bilden.]

Meumann hoped for help from the physiologist who had worked so well with the psychologists in Leipzig:

My only hope is Prof. von Frey, who, as you will have heard, is coming to Zürich.... I have already made my request to him by letter, and he has agreed to give me a room in the Physiological Institute. That is no acceptable substitute for the Psychological Institute [in Leipzig], but at least in this way I can have the opportunity to do some work. I have bought, among other things, my complete Leipzig time-sense apparatus, and I will finish the work to which I have already devoted so much time and effort.

[Meine ganze Hoffnung ruft nur auf H. Prof. von Frey, der wie Sie gehört haben werden, nach Zürich kommt.... Ich habe mich sogleich an v. Frey brieflich gewendet, und er hat mir ein Zimmer im physiologischen Institut zugesagt. Das ist nicht unbedenklicher Ersatz für das psychologische Institut, aber ich kann auf diese Weise wenigstens mir selbst eine Arbeitsgelegenheit verschaffen. Ich habe mir u. a. meine vollständige Leipziger Zeitsinneinrichtung besorgt, und werde diese Arbeit, auf die ich so viel Zeit und Mühe verwendet habe, hier zur Vollendung bringen.]⁵⁰

⁵⁰ Meumann to Wundt, 14 October 1897, UAL, Wundt Nachlass, Nr. 698. The time-sense apparatus became known as "Zeitsinn-Apparat nach Meumann." See E. Zimmermann, XVIII. Preis-Liste über psychologische und physiologische Apparate, 1903 (Faksimilenachdruck: FIM-Psychologie Modellversuch, Universität Erlangen-Nürnberg und Institut für Geschichte der Neueren Psychologie, Universität Passau, in Zusammenarbeit mit den Sondersammlungen des Deutschen

Wundt wrote back to reassure and, as usual, to advise:

I am very pleased for you that von Frey is coming to Zürich. He is, of course, one of the few physiologists who are devoted to experimental psychology. Besides that, he is a splendid personality, and I am sure you will get on with him very well. I also want to recommend strongly that you establish and cultivate connections to the 'naturforschende Gesellschaft.' In the circles of natural scientists, its general judgment is very authoritative. Once you have their support, you will surely accomplish many things which at first appear to be unreachable.

[Sehr hat es mich in Ihrem Interesse gefreut, dass v. Frey nach Zürich kommt. Er gehört ja zu den wenigen Physiologen, die der experimentellen Psychologie zugetan sind. Überdies ist er eine vortreffliche Persönlichkeit, mit der Sie gewiss immer gut auskommen werden. Sehr empfehlen möchte ich Ihnen auch, zur 'naturforschenden Gesellschaft' Beziehung zu suchen und zu pflegen. Sie ist in den Naturwissenschaftlichen Kreisen sehr massgebend für das allgemeine Urtheil. Und wenn Sie das erst gewonnen haben, so werden Sie gewiss manches durchsetzen, was zunächst unreichbar scheint.]⁵¹

Neumann anticipated opposition to the new direction in psychology. Perhaps Külpe's problems in

Würzburg made him cautious:

My colleagues here are somewhat mistrustful of my intentions. In spite of the faculty's desire to have a 'modern' psychologist, they cannot yet quite reconcile themselves to the idea of an experimenting philosopher. But I do not doubt that this impediment will soon disappear. Perhaps I can remove it soon with my inaugural lecture, which will address the relationship between experimental psychology and pedagogy.

[Die Kollegen hier stehen meinen Absichten etwas misstrauisch gegenüber. Trotz des Wunsches der Fakultät, einen 'modernen' Psychologen zu besitzen, kann man sich mit der Idee eines experimentierenden Philosophen noch nicht recht befreunden, doch zweifle ich nicht, dass diese Hemnisse bald schwinden werden. Vielleicht beseitige ich sie schon mit meiner Antrittsvorlesung, die sich mit den Beziehungen der experimentellen Psychologie zur Pädagogik beschäftigen wird.]⁵²

Meumann saw the opportunity to use pedagogy to gain acceptance and perhaps even influence in Zürich. He therefore tended to ignore Wundt's advice to cultivate connections to natural scientists and to avoid involvement in the politics of teacher training.

Spending holidays with his family in the Rhineland, he wrote Wundt a long report on his first semester in Zürich. He had good enrollments: 60 students in "Psychology" and 79 in "General Pedagogy." The pedagogy lectures required much work, Meumann explained, because he was completely recasting the traditional Herbartian subject in order to base it on Wundt's conceptions of feelings and will [Gefühls- und Willenspsychologie]. A few years later, Meumann announced a program for

Meuseums München, 1983), 54-55.

⁵¹ Wundt to Meumann, 19 October 1897, UAL, Wundt Nachlass, Nr. 699.

⁵² Meumann to Wundt, 14 October 1897, UAL, Wundt Nachlass, Nr. 698.

“experimental pedagogy,” parallel to Wundt’s experimental psychology. Chapter Eight discusses the conflict between Meumann and his teacher over this application of experimental psychology.

The psychology lectures, Meumann continued his report, demanded no special intellectual preparation, just a lot of inconvenience due to the shortage of classrooms.

My course on psychology requires only a lot of *superficial* work from me. With the fortunate arrangement in Leipzig, you can hardly imagine the way it is here. Whenever I have to make significant preparations for an experimental lecture, I must manage to do it entirely during the “academic quarter-hours,” since the auditorium is otherwise unavailable. So I lie in wait in my office the whole afternoon, and as soon as one colleague finishes, I can make preparation for another 15 minutes, until the next one arrives. The battle for auditoriums is so great that Prof. Schmiedel (theology) has to give his four-hour course in four different auditoriums. This problem derives from the fact that the collections, particularly those for zoology and botany, are partially housed in the larger lecture halls. The Ministry of Education has been planning a new building for these collections for about 15 years now, but all the professors are of the opinion that nothing will come of it as long as old Grob has the rudder [as director of the Educational Ministry]. He takes no interest at all in this problem.⁵³

[Meine “Psychologie” macht mir nur viel *äussere* Arbeit. Von dieser können Sie sich allerdings bei den glücklichen Verhältnissen in Leipzig kaum Vorstellung machen. Wenn für eine Experimentierstunde einmal grössere Vorbereitung nötig ist, so muss diese ganz in den “akademischen Vierteln” besorgt werden, da sonst das Auditorium nicht verfügbar ist, dann liege ich den Nachmittag im Sprechzimmer auf der Lauer und sobald ein Kollege schliesst, wird 15 Minuten lang weiter aufgebaut, bis der nächste kommt. Der Kampf um die Auditorien ist so gross, dass H. Kollege Schmiedel (Theologe) eine vierstündige Vorlesung in 4 verschiedenen Auditorien liest. Die Ursache des ganzen Uebelstandes liegt darin, dass die Sammlungen, namentlich die zoologische und botanische z. Teil in den grösseren Hörsälen untergebracht sind. Die Erziehungsdirektion plant seit etwa 15 Jahren einen Neubau für die Sammlungen, aber sämtliche Professoren sind der Ansicht, dass daraus nichts wird, so lange der alte Grob am Ruder ist, der ganz interesselos diesen Uebelständen gegenübersteht.]

In addition to these valiant efforts, Meumann also announced that an experimental laboratory would soon be established in Zürich: he had been spurred into action by some of the Privatdozenten in philosophy.

The faculty has been relatively supportive of me; in particular I can thank the present rector for many advantages.⁵⁴ So far I have gotten from the university a large cabinet for apparatus, a battery and battery case, gas connections and a lab table. Since I have bought all the necessary apparatus from Zimmermann, Appun, and Steeg and Reuter, experimental psychology has become a fact in Zürich, and I want to give an introductory laboratory course [which he had given in Leipzig as Institute Assistant] already next semester. You

⁵³ The severe shortage of space at that time is confirmed by the university historians: Ernst Gagliardi, Hans Nabholz, and Jean Strohl, eds., *Die Universität Zürich 1833-1933 und ihre Vorläufer: Festschrift zu Jahrhundertfeier* (Zürich: Verlag der Erziehungsdirektion, 1938), 764, 765, 945.

⁵⁴ The rector that year was Gerold Meyer von Kronau, a historian who had been a colleague of Wundt’s when he was at Zürich.

will perhaps be surprised that I have gone into experimenting with such a will. But that was made necessary by, among other things, my relationship to my junior colleagues. Willy and Eleutheropulos had in fact planned to announce courses in experimental psychology. That would have been a matter of indifference to me in the case of Eleutheropulos, but in Willy's inaugural lecture [Antrittsvorlesung] I saw that his opinion is directly opposed to experimental psychology.⁵⁵ Now that [i.e. the plan to lecture critically on experimental psychology] has been made morally impossible by my action. The most unpleasant thing about Zürich are the collegial relations in our section. I have done tolerably well with Kym. But the Education Council [Erziehungsrat] has the practice of admitting Privatdozenten without any limitation, and the faculty merely has the privilege of writing evaluations of those habilitating. So Zürich now possesses these Privatdozenten in philosophy: Kreyenbühl, Bösch, Carstanjen, Willy, Eleutheropulos, Förster, and Kraeger!

[Mir ist die Fakultät verhältnismässig sehr bereitwillig entgegengekommen, und namentlich der Theilnahme des jetzigen Rektors verdanke ich manchen Vorteil. Ich habe von der Universität bis jetzt erhalten, einen grossen Experimentierschrank, eine Batterie und Batterieschrank, Gasanschlüsse und Experimentiertisch. Da ich mir von Zimmermann, Appunn und Steeg u. Reuter alle notwendigen Apparate beschafft habe, so ist die experimentelle Psychologie für Zürich zur Tatsache geworden, und im nächsten Semester will ich schon einen Einführungskursus abhalten. Es wundert Sie vielleicht, dass ich so scharf mit den Experimentieren ins Zeug gegangen bin. Aber dazu nötigt mich unter Andern das Verhältnis zu den jüngeren Kollegen. Willy und Eleutheropulos hatten ebenfalls vor, experimentelle Psychologie anzukündigen. Bei Eleutheropulos wäre mir das gleichgültig gewesen, aber aus Willy's Antrittsvorlesung sah ich, dass er direkt gegen die experimentelle Psychologie Stellung nimmt, das ist durch mein Vergehen nun moralisch unmöglich geworden. Das Ungemütlichste in Zürich sind die kollegialischen Verhältnisse in unserer Sektion. Mit Kym kam ich *bis jetzt* leidlich aus. Aber der Erziehungsrat hat die Praxis, ohne jede Beschränkung Privatdozenten zu zulassen, und der Fakultät steht nur ein Gutachten über den Habilitandus zu. So besitzt Zürich nunmehr an philosophischen Privatdozenten: Kreyenbühl, Lösch, Carstanjen, Willy, Eleutheropulos, Förster, und Kraeger!]

Meumann added that he had been discouraged from rejecting habilitation essays even when he found them to be unsuitable.

Meumann's expressions of powerlessness to change things in Zürich indicates his determination to do precisely that--change the philosophical direction there. He told Wundt of his plans to bring Max Brahn from Leipzig to work with him (presumably on Brahn's specialty, pedagogy) and also to find young Swiss scholars who would do research in experimental psychology. In the meantime, Meumann had to contend with Friedrich Cartanjen, who was carrying on the Avenarius legacy in Zürich:

I cannot develop close relations to Dr. Carstanjen nor therefore to the *Vierteljahrsschrift*. Carstanjen is an Avenarius fanatic. For that reason I consider him to be a fairly insignificant person who has managed with some effort to establish himself firmly in the Avenarius manner of speaking and thinking, from which he will never depart. It is really a nuisance that the *Vierteljahrsschrift* finds itself in his hands--under the title of a general-

⁵⁵ Willy's inaugural lecture began a genre of articles on the "crisis in psychology," a phrase that returns in Chapter Eight. He criticized Wundt from the point of view of Avenarius. Rudolph Willy, "Die Krisis in der Psychologie," *Vierteljahrsschrift für wissenschaftliche Philosophie*, 21 (1897), 79-96, 227-249, 332-353.

philosophical journal it makes propaganda for the Avenarius philosophy. Until now, Carstanjen had the best chances for any position that should open up here. I have no alternative but to do everything possible to prevent that. To me, the Avenarius direction just seems too unproductive [unfruchtbar].

[Zu Dr. Carstanjen und damit zur "Vierteljahrsschrift" kann ich in kein näheres Verhältnis treten. C. ist Avenarius-Fanatiker. Dazu halte ich ihn für einen ziemlich unbedeutenden Menschen, der es mit einiger Mühe fertig gebracht hat, sich in Avenarius' Sprech- und Denkweise fest zu rennen und der nun nie wieder davon loskommen wird. Es ist wirklich ein Ubelstand, dass sich die "Vierteljahrsschrift" in diesen Händen befindet, unter dem Titel einer allgemein-philosophischen Zeitschrift wird da Propaganda gemacht für Avenarius'schen Philosophie. Carstanjen hatte bisher am meisten Aussicht, hier bei etwaiger Neubesetzung berücksichtigt zu werden; ich kann mir aber nicht helfen, ich werde Alles aufbieten, um das zu verhindern, da mir die Avenarius'sche Richtung zu unfruchtbar erscheint.]⁵⁶

If the administration insisted upon advancing one of the Zürich philosophers when Kym retired, Meumann vowed to support the theologically inclined Kreyenbühl over Carstanjen.

Wundt was pleased by the progress in setting up experimental psychology at Zürich, and he agreed with Meumann's assessment of his colleagues there:

I was heartily pleased by your letter from Godesburg and by the good news it contained. It has surely been a major difficulty for you to start up experimental psychology so energetically in your very first semester. But it is just as well that you have this pretty much behind you now, so that you will have an easier time of it in the coming semesters. I estimate your teaching success to be all the more impressive because in my experience the Swiss student generally attends only the lectures that really interest him. As an economical person--and the Swiss in general are--he does not enroll in any course which he will not attend. Moreover, it is clear that the threat from competitors, as alarming as they are numerically, is in fact not particularly great, from what I know about Eleutheropulos and Willy, the only ones among your colleagues in philosophy, besides Kym, that I know personally. Your remarks about Carstanjen affirm the impression that his writings have made upon me, including his most recent essay on empiriocriticism in the *Vierteljahrsschrift*. I would really feel sorry for the students who had to endure such scholastic jibberish!

[Ueber Ihren Brief aus Godesburg und über die in ihm enthaltenen guten Nachrichten habe ich mich herzlich gefreut. Dass Sie so energisch gleich im ersten Semester mit der experimentellen Psychologie ins Zeug gegangen sind, ist für Sie gewiss in diesem ersten Semester eine grosse Erschwerung gewesen. Um so besser, dass Sie das nun im wesentlichen hinter sich haben und in den nächsten Semestern es so viel leichter haben werden. Ihren Lehrerfolg schlage ich um so höher an, als nach meinen Erfahrungen der Schweizer Student im allgemeinen nur hört wofür er wirklich Interesse hat, und dass er als ökonomischer Mensch, wie es die Schweizer im allgemeinen überhaupt sind, kein Colleg belegt, das er nicht hört. Zugleich ergibt sich daraus, dass die Gefahr der Concurrenz, so erschreckend gross diese numerisch ist, doch nicht sonderlich gross ist, was ich mir bei Leute wie Eleutheropulos und Willy, den einzigen Ihrer philosophischen Collegen, die ich ausser Kym persönlich kenne, wohl denken kann. Ihre Bemerkungen über Carstanjen bestätig mir den Eindruck, den mir seine Aufsätze, auch sein neuester in der *Vierteljahrsschrift* über den Empiriocriticismus, gemacht haben. Ich würde wirklich die Studenten bedauern, die dieses

⁵⁶ Meumann to Wundt, 31 December 1897, UAL, Wundt Nachlass, Nr. 700.

scholastische Gerede erdulden müssten!⁵⁷

Meumann's initial difficulties at Zürich were in many ways similar to Külpe's at Würzburg. Each felt he was representing experimental psychology among hostile philosophers, whether Catholic conservatives in Würzburg or the "Avenarius fanatics" in Zürich. Neither man had a very prestigious professorship, and both were hoping to move on soon. Meumann, in fact, had not been so eager to come to Zürich in the first place, but had counted on it to fulfill its traditional role as an "academic waiting room" for those headed to greater glory in the north. This role turned out to be less clear in Meumann's time than it had been earlier.⁵⁸

Wundt reminded Meumann that the experimental psychologist also encountered problems Germany. In particular, he cited Götz Martius's recent circumstances:

The academic situation in Germany is, by the way, not always ideal either, especially in Prussia, as you no doubt have heard during your Christmas vacation in Bonn. There they have chosen Benno Erdmann from Halle to be Meyer's successor, *and he was not even recommended by the faculty*. This seems to involve all sorts of dislocations, which are simply orchestrated in Berlin, over the heads of the faculty. I would find it to be very unjust, if this means that Götz Martius, who has founded an institute with his own funds, has placed it at the disposal of Bonn University for several years now, and has devoted considerable effort, were now simply pushed aside.

[Dass auch in Deutschland übrigens die akademischen Verhältnisse nicht immer ideal sind, besonders in Preussen, werden Sie wohl bei Ihrem Weihnachtsaufenthalt in Bonn gehört haben. Dort ist jetzt Benno Erdmann aus Halle zum Nachfolger Meyers ernannt, *der gar nicht von der Fakultät vorgeschlagen war*, und daran scheinen sich allerlei Verschiebungen anschliessen zu sollen, die über die Köpfe der Fakultät hinweg einfach von Berlin aus dirigiert werden. Ich würde es sehr unrecht finden, wenn dabei Götz Martius, der nun seit einer Reihe von Jahren der Bonner Universität sein aus eigenen Mitteln gegründetes Institut zur Verfügung gestellt und sich redliche Mühe gegeben hat, einfach zur Seite geschoben würde.]

Wishing him success for his second semester in Zürich, Wundt gave Meumann advice very much attuned to the personality of his independent young colleague:

I have not seen von Frey during this semester, so I do not even know whether he is going back to Zürich. Considering the direction of von Frey's own work and his general personality, it really surprises me that you found so little support in the Physiological Institute. But, of course, it is ultimately the best thing if you stand on your own two feet, and that is in any case the best way to make the most progress, in Zürich particularly.

⁵⁷ Wundt to Meumann, 15 January 1898, UAL, Wundt Nachlass, Nr. 701.

⁵⁸ These prominent natural scientists began their careers in Zürich: Adolf Fick (1851-61), Karl Ludwig (1849-56), Carl Nägeli (1842-52), Rudolph Clausius (1855-67). More recent ascending stars were Wundt (1874-75) and Wilhelm Windelband (1876-77).

[Von Frey habe ich in diesen Ferien nicht gesehen, und ich weiss daher nicht einmal, ob er wieder nach Zürich zurückgeht. Dass Sie im physiologischen Institut keine besondere Stütze finden, hatte ich eigentlich nach der Richtung von Frey's eigenen Arbeiten und nach seiner sonstigen Persönlichkeit nicht erwartet. Aber schliesslich ist es doch jedenfalls das beste, wenn Sie sich auf eigene Füsse stellen, und jedenfalls ist das auch der Weg, auf dem man besonders in Zürich am weitesten kommt.]⁵⁹

Wundt advised Meumann to mind his health and not to overwork, especially not to take on extra lectures, despite the extra money they provided.

Meumann did very well in Zürich--and he did work very hard. By his second semester he had outfitted a psychological laboratory "in modest rooms" in the basement of the university building.⁶⁰

Wundt was so enthusiastic about this development that he visited Zürich during the next summer vacation. A postcard arranged their lunch date:

By the way, [my wife and I] wish otherwise to stay *incognito* in Zürich--as far as all our Zürich acquaintances and any others who might happen to be there are concerned--since we only have one day for Zürich anyway. But I must see your Institute, notwithstanding! "Übrigens wollen wir sonst--allen Züricher Bekannten und sonst etwa in Zürich sich Aufhaltenden gegenüber--dort *inkognito* verweilen, da wir ohnehin nur einen Tag für Zürich haben. Ihr Institut muss ich aber gleichwohl sehen!"⁶¹

Wundt was satisfied with Meumann's situation in Zürich, and he wrote to reassure Külpe:

In no way did I have the alarming impression of Meumann that you describe. He seemed to be doing very well, and he was quite pleased with the rooms given over for his use.

[Von Meumann hatte ich...durchaus nicht den besorgniserregenden Eindruck, den Sie schildern. Er schien sich recht wohl zu befinden und freute sich der Räume, die ihm für seine Zwecke angewiesen waren.]⁶²

Things continued to improve for Meumann in Zürich. Kym finally retired, and Meumann became a full professor in 1899. (Actually, he succeeded Avenarius; Kym's chair, vacant for a while, went to Heinrich Georg Maier in 1901.) In addition, the new director of the Educational Ministry seemed more disposed toward progress. Ironically, this good fortune made Meumann express his doubts whether a demanding career left room for a worthwhile personal life. Wundt responded in a characteristically fatherly way:

⁵⁹ Wundt to Meumann, 11 April 1898, UAL, Wundt Nachlass, Nr. 702.

⁶⁰ Gagliardi *et al. op. cit.*, 845.

⁶¹ Wundt to Meumann, 30 July 1898, UAL, Wundt Nachlass, Nr. 703.

⁶² Wundt to Külpe, 29 October 1898, UAL, Wundt Nachlass, Nr. 394.

The end of your letter sounds remarkably resigned. But I think that one does not close off one's life at your age. The professorship in Zürich is certainly a fine thing, but now to say with Faust, 'verweile doch, etc.'—it does not suffice for that. I myself was older than you are when I married, and I have never regretted that yet.

[Der Schluss Ihres Briefes klingt ja merkwürdig resigniert. Ich denke doch, in Ihrem Alter schliesst man nicht mit dem Leben ab. Ein Ordinariat in Zürich ist zwar sehr schön—aber um mit Faust zum Augenblick zu sagen "verweile doch etc."—dazu reicht es doch wohl nicht aus. Ich selbst war älter als Sie, als ich mich verheirathete, und ich hab' es noch nie bereut.]⁶³

The letter which evoked this response from Wundt is not preserved, but clearly Meumann feared that he had, like Faust, allowed the devil to start dealing for his soul. Important aspects of his life were lacking, as he plunged into the business of being professor of philosophy with a specialty in the new experimental psychology. Wundt did his best to encourage this favorite student, whose character was so different from his own. But he was unable to keep Meumann from overworking and from extending his research into areas that Wundt considered marginal at best.

Meumann and his psychological institute define a watershed in the development of philosophy at Zürich. Before him, the university historian points out, F.A. Lange, Wundt, Windelband, and Avenarius had represented "universal philosophy." The focus narrowed to experimental psychology with Meumann and those who came after him: Arthur Wreschner, Gustav Störing, Friedrich Schumann, and G.F. Lipps.⁶⁴ Meumann, Störing, and the younger Lipps all were students of Wundt; Wreschner and Schumann came from Berlin. Meumann's influence in Zürich University was such that he was able to shut out the Avenarius partisans and make experimental psychology the main thrust of philosophy there. None of the Privatdozenten that Meumann had complained about in his early letter to Wundt ever advanced even to Extraordinarius at Zürich.

Meumann's friend Störing joined him in Zürich when Kym's successor, Heinrich Georg Maier, left after only two years to return to Tübingen. Wundt himself suggested Störing as Maier's replacement: "He now gives nearly all his lectures on philosophy, not psychology." [Er liest jetzt fast nur *philosophische* (nicht *psychologische*) Collegien.]⁶⁵ A psychiatrist-turned-philosopher, Störing had written a book on psychopathology's contributions to the study of normal psychology and epistemology--

⁶³ Wundt to Meumann, 29 October 1899, UAL, Wundt Nachlass, Nr. 705.

⁶⁴ Gagliardi *et al.*, *op. cit.*, 844.

⁶⁵ Wundt to Ernst Meumann, 4 April 1901, UAL, Wundt Nachlass, Nr. 710.

somewhat reversing Kraepelin's program.⁶⁶ His *Berufung* to the second chair in philosophy strengthened the hold of psychologists in Zürich.

In the meantime, Arthur Wreschner, who had studied with Ebbinghaus in Berlin, habilitated with Meumann in 1900 and started teaching psychology and systematic philosophy in Zürich. He became Meumann's first laboratory assistant in 1902 and gave the introductory course for the laboratory. Wreschner's research concentrated on the medical or physiological side of psychology, and especially on voice and speech. He was made Extraordinarius in 1910 but never became full professor. Johannes Hielscher also habilitated with Meumann and served as assistant in the Psychological Institute. After teaching psychology and aesthetics at Zürich from 1902 to 1908, he went to Münster.

The active group of young psychologists in Zürich contributed articles to Wundt's journal.⁶⁷ Then in 1903, Meumann founded and began editing *Archiv für die gesamte Psychologie*, the journal intended to replace and extend Wundt's *Philosophische Studien*. Two years later, Meumann had the opportunity to leave Zürich for a Prussian university and to expand his career horizons even further.

Wundt's program was, in many respects, expanding at the turn of the century. His most experienced Institute Assistants, Oswald Külpe and Ernst Meumann, held the chairs of philosophy in Würzburg and Zürich, respectively. These were not the most important centers of German philosophy, but they represented solid extensions of the Leipzig Institute, and of Wundt's theoretical and methodological program for psychology. Even though Wundt's ally Götz Martius now worked in Kiel, the presence of Wundt's program in Prussian universities was still not very strong. There other professors of philosophy had different ideas about psychology.

⁶⁶ Gustav Störing, *Vorlesungen über Psychopathologie in ihrer Bedeutung für die normale Psychologie mit Einschluss der psychologischen Grundlagen der Erkenntnistheorie* (1900).

⁶⁷ Margaret Keiver Smith, "Rhythmus und Arbeit," *Philosophische Studien*, 16 (1900), 71-134, 197-306; P. Zoneff, "Über Begleiterscheinungen psychischer Vorgänge in Athem und Puls, Erster Artikel," *ibid.*, 18 (1903), 1-113; Dobri Awramoff, "Arbeit und Rhythmus: Der Einfluss des Rhythmus auf die Quantität und Qualität geistiger und körperliche Arbeit, mit besonderer Berücksichtigung des rhythmischen Schreibens," *ibid.*, 18 (1903), 515-562. Wundt and Meumann had planned also to print Hielscher's habilitation essay, but for some reason they did not: Wundt to Ernst Meumann, August 4, 1901, UAL, Wundt Nachlass, Nr. 710; Wundt to Ernst Meumann, 3 May 1902, *ibid.*, Nr. 711.

Chapter VII

Wundt and the competition with other German psychologists, 1887-1896.

In the early 1890s, Wundt was unquestionably the dominant figure in experimental psychology, in America as well as in Europe, and some of his students in psychology were ready to become professors of philosophy in German universities. By that time, however, other experimental psychologists in other German universities were beginning to challenge Wundt's preeminence in this new field of research.

In his article on psychology for the 1893 Columbian Exposition in Chicago Wundt counted three psychological institutes in German universities, in addition to Leipzig's. Three other universities had collections of demonstration apparatus which were available for informal research.¹ The following are the four universities with institutes, or laboratory-based training seminars, along with founders and founding dates:

Leipzig (Wilhelm Wundt, 1879)
 Berlin (Hermann Ebbinghaus, 1886)
 Göttingen (G.E. Müller, 1887)
 Bonn (Götz Martius, 1889)

Three universities had "collections of apparatus functioning as informal laboratories":

Breslau (Benno Erdmann, 1885;
 more formally by Theodor Lipps, 1890)
 Munich (Carl Stumpf, 1889)
 Halle (Benno Erdmann, 1890)²

Münsterberg had had a private laboratory at Freiburg, but Wundt knew that he had taken his equipment with him when he left for Harvard in 1892.

Seven psychological laboratories in Germany in 1893 may seem a poor showing, compared to the twelve American ones enumerated the previous year in Scripture's letter to Wundt (see Chapter Five). At this time, moreover, only the Leipzig laboratory had more than a handful of researchers. The laboratory of Götz Martius was strongly allied to Wundt's, that of Theodor Lipps (hardly a research laboratory

¹ Wundt, "Psychophysik und experimentelle Psychologie," in *Die deutsche Universitäten (für die Universitätsausstellung in Chicago 1893)*, ed. W. Lexis, vol. 1 (Berlin: A. Asher, 1893), 450-457; 451.

² On Breslau and Halle, see Richard Höningwald, "Die philosophische Fakultät. Die philosophisch-historische Fächer. Philosophie," in *Festschrift zur Feier des hundertjährigen Bestehens der Universität Breslau. Erster Teil: Geschichte der Universität Breslau 1811-1911*, ed. Georg Kaufmann (Breslau: Ferdinand Hirt, 1911), 337-348.

anyway) only loosely so. The other directors were all independent of, and often critical of Wundt.

To the north and to the west of Leipzig, the Prussian psychologists generally preferred physiological explanations over Wundt's special psychological categories. To the south, in Bavaria and Austria, psychology tended to be less physiological and more involved with new trends in philosophical thought. In the 1870s and 1880s, Wundt represented a kind of medium position, conceptually and geographically, between these opposing approaches, but in the 1890s the two extremities joined forces against the Wundtian middle. This curious alliance produced alternative views of psychology as a field of study and eventually also competition for Wundt's students on the academic job market. G.E. Müller, Hermann Ebbinghaus, and Benno Erdmann all worked in Prussian universities, and Carl Stumpf came to Berlin in 1894, having spent his early career primarily in Austria and Bavaria. His move to the capital of the German Reich (and of the dominant German State) signaled a challenge to Wundt's dominance of experimental psychology.

A. The experimental side: Prussians, physiological interpretations.

1. G.E. Müller, grand old experimentalist in Göttingen.

Georg Elias Müller (1850-1934) was the experimentalists' experimentalist. His precision in measurement and logical, mathematical clarity in interpretation of data made him a formidable critic.

The son of a Protestant minister who taught religion at the *Fürstenschule* in the Saxon city of Grimma, Müller was early drawn to studies of history and philosophy.³ After he returned from service in the Franco-Prussian War, he read Helmholtz's work on physiological optics and was convinced that natural science was the path to the true philosophy. He therefore went to study philosophy with Lotze at Göttingen. Doing no original experiments, he reviewed the psychological problem of sensory attention for his doctoral dissertation in 1873.⁴ He habilitated in 1876, also with Lotze, and his habilitation essay, which appeared two years later in book form, proposed theoretical and methodological improve-

³ For biography of Müller: Boring, 371-379; and Arthur L. Blumenthal, "Shaping a tradition: Experimentalism begins," in *Points of view in the modern history of psychology*, ed. Claude E. Buxton (Orlando, FL: Academic Press, 1985), 51-83; 53-61.

⁴ G.E. Müller, *Zur Theorie der sinnlichen Aufmerksamkeit* (Leipzig: Edelman, 1873).

ments to Fechner's work on psychophysics.⁵ By the time Fechner responded to Müller in 1882,⁶ Müller had established himself as a theoretical psychophysicist.

G.E. Müller favored physiological explanations for psychological phenomena, whereas Wundt increasingly emphasized distinctly psychological factors. This difference is ironic, considering Wundt's excellent education and experience in physiology and Müller's training as a philosopher. Müller's writings challenged certain assumptions of Fechner's psychophysics and Wundt's physiological psychology, complicating the quest for a useful definition of the field of psychology.

Müller's dissertation (1873) expounded a physiological theory of attention: the direction of attention was held to involve changes in blood supply to certain areas of the cerebral cortex. These changes produce excitations of those areas of the brain; the secondary circulatory excitations result in nervous discharges—signals which begin the voluntary movements. Modern scanning technology has shown that Müller's guess about circulatory activity was on the right course, but he said nothing about Sechenov's doctrine of inhibitory action of the central nervous system, of which most nerve physiologists at the time were already aware. In the same year Müller's dissertation was published, the first edition of Wundt's *Grundzüge* (1873/74) introduced the apperception model based on central innervation and inhibition. Müller's students were to later update his work on attention.⁷

Müller's theory of attention did not really offer physiological causes for psychic events, but rather phenomenological descriptions of physiological processes associated with psychic actions. Such descriptive discussions became increasingly popular, particularly Müller's physiological interpretation of Fechner's Psychophysical Law. Wundt made Fechner's relation a special case of his general Law of Relativity, a purely psychological relation. Fechner's own psychophysical interpretation had assumed that there was inevitable loss of strength when a sensory signal moved from body to mind. Müller preferred to assume that the relationship of proportionality resulted entirely from physical-chemical processes in the nervous system. He suggested that stimuli affected a nerve substance which was progressively more difficult to oxidize: the weaker stimulus exhausted the easily oxidizable substance, and

⁵ G.E. Müller, *Zur Grundlegung der Psychophysik* (Berlin: Grieben, 1878).

⁶ Gustav Theodor Fechner, *Revision der Hauptpunkte der Psychophysik* (Leipzig: Breitkopf & Härtel, 1882).

⁷ Especially Alfons Pilzecker, *Die Lehre von der sinnlichen Aufmerksamkeit* (Munich: Straub, 1889).

the stronger stimulus oxidized marginally less nerve substance.

Although admittedly conjectural, Müller's physiological interpretations nevertheless appealed to students of psychology who did not want to follow Fechner into the mystical oneness of body and mind and who did not accept Wundt's special psychological terminology. Müller's attitude on the relationship between physiology and psychology became the prevailing one in the following generation, even among some of Wundt's students. His technical and experimental skill added credence to his physiological theories for psychic action, and young researchers made his preferred mode of thinking into a kind of methodological dogma.

Müller improved psychophysics, both the experimental methods and the critical analysis of data from measurements. Exactness was his hallmark, and he thought of many ways to improve it. For example, in the method of right and wrong cases, in which the subject judges whether or not a test stimulus matches a base stimulus, Müller reasoned that subjects were strongly inclined to notice a change; under certain circumstances this anticipation would bias the reported just-noticeable differences. For example, in an acoustical experiment where a base pitch is followed by test pitches, each going slightly higher, the subject tends to report the change too soon. Müller suggested running a second series, in which test pitches start significantly higher than the threshold and approach the base pitch from above; the subject reports when the test pitch equals the base, again a bit too soon. With the test pitch going higher and higher above the base, the reported j.n.d. is smaller; approaching the base it is larger; the mean value gives a good estimate of the j.n.d. This is only one simple example of the many improvements Müller introduced in psychophysics, beginning in the late 1870s.⁸

After four years as a Privatdozent in Göttingen, Müller became professor of philosophy at Czernowitz in the Austrian Empire in 1880. The next year he returned to Göttingen, where he spent the rest of his long career.

Müller was unusually young (31) to become a full professor, when, as his teacher's strong favorite, he succeeded Lotze. Lotze was in an ideal position to name his successor, since he was being

⁸ Oswald Külpe, *Outlines of psychology, based upon the results of experimental investigation*, trans. Edward Bradford Titchener (London: Swan Sonnenschein, 1895), 29-86. For other examples, see Edward B. Titchener, *Experimental psychology: A manual of laboratory practice, volume II [quantitative]* (NY: Macmillan, 1905).

wooded to Berlin from another Prussian university. (Göttingen is in Hanover, which Prussia annexed in 1866.) Müller thus ascended easily to the chair that, occupied for nearly fifty years by Herbart and Lotze, made Göttingen a center of psychological thought in Germany. By this time, however, Wundt was raising the stakes for psychology by directing doctoral research based on experiments in his Leipzig laboratory. Not until 1887 did the university give Müller rooms for experimental work, and he received only token funding starting in 1891. Nevertheless, with private funds (including his own) and the technical talent of his assistants, Göttingen was the second-most important site for research in experimental psychology in Germany, at least through the 1890s. It is reasonable to choose the year Müller's laboratory opened, 1887, as the start of serious competition in German experimental psychology.

Müller's long residence in Göttingen made him into something of an institution, like Wundt in Leipzig. Moreover, his devotion to experimental work and his consistently high standards inspired psychologists on both sides of the Atlantic. Boring's *History of experimental psychology* gives Wundt the distinction of being founding father, but Müller is in fact the softly sung hero: "He was purely a psychologist....Müller succeeded in leaving philosophy, his first love, behind him and in sticking to psychology....Müller is the first experimental psychologist, among men whom we have considered, who was little else than an experimental psychologist....As a power and an institution he was second only to Wundt."⁹

Americans' partiality to Müller over Wundt was evident already in the early 1890s, in spite of (or perhaps because of) the fact that many more of them studied with Wundt. When the psychiatrist William O. Krohn reported on his tour of German laboratories (from July 1891 to March 1892) in the *American journal of psychology*, Müller's lab won highest marks. Krohn gave Wundt his due as director of the first and best-known psychological laboratory, but he also noted limitations of the quarters in the old *Convict* and of the apparatus, which was "a little antiquated."¹⁰ The traveling psychological reporter then heaped praise on G.E. Müller's laboratory. By his account, the Prussian administration merely provided some space for the facilities, and Müller, in addition to his own funds, had a benefactor

⁹ Boring, 374, 379.

¹⁰ William O. Krohn, "Facilities in experimental psychology at the various German universities," *American journal of psychology*, 4 (1892), 585-594.

who helped him equip his laboratory.

This laboratory is in many respects the best for research work in all Germany. It is peculiar that it owes its excellent equipment to a liberal gift from a private individual, the state giving but a mere pittance to its support. To the generosity of a former student and friend is Professor Müller indebted for the laboratory of which any university in any land might be justly proud. Not only is the apparatus entirely new, but it is exceedingly well constructed. The rooms so recently set aside by the curator of the University for this laboratory are so well adapted to the purpose of research and of such generous size that the old time objection of 'limited space' can no longer be urged against the Psychological Laboratory at Göttingen. Besides the very large auditorium, they have three other large rooms, well-fitted for different lines of research work, and a well arranged dark room--indeed this dark room is an ideal one. With the commodious quarters and their carefully selected equipment, Professor Müller and Dr. Schumann are well equipped for guiding a large number of students in experimental work. Professor Müller's investigations are well known and Dr. Schumann has recently distinguished himself by some important pieces of work. He is also a skillful mechanical contriver and every one of the old standard pieces of apparatus in this laboratory (e.g., the control hammer) has undergone some improvement. He is a very ambitious man, and most worthy of the best success. He certainly has a remarkable future. Like Müller, he aims at accuracy and thoroughness rather than the accomplishing of a large amount of poorly done work.¹¹

The phrase "large amount of work poorly done" probably refers to the spate of doctoral dissertations out of Wundt's Institute, then appearing in Wundt's journal.

This American observer's enthusiasm could not change the fact that Müller's work continued to have limited state support. Mitchell Ash's study of the academic politics of experimental psychology¹² seems to agree with Boring's view that Müller was the real specialist in psychology among the early founders of psychological institutes in Germany. Ash makes Müller a spokesman for the field as a whole. In his presidential address to the German Society for Experimental Psychology in 1914, Müller complained about psychology's slow progress in Germany. His institute's annual budget--at the time 1200 marks--went mostly to maintenance of the quarters, leaving only about 140 marks each year for purchase of new apparatus--only 5-6 marks for each research project then underway. Moreover, Müller noted, only two or three institutes in Germany had any better financial support at that time. (The two were at Berlin and Leipzig; the institute Külpe established at Würzburg would be a possible third.)

Ash explains Müller's problem, and that of German psychology as a whole, in terms of the Ger-

¹¹ William O. Krohn, "The laboratory of the Psychological Institute at the University of Göttingen," *American journal of psychology*, 5 (1893), 282.

¹² Mitchell Ash, "Academic politics and the history of science: Experimental psychology in Germany 1879-1914," *Central European history*, 13 (1980), 255-286.

man system of academic calls. Müller's reputation as a specialist in psychophysics made him a less-attractive candidate for calls to other universities, and such calls were the way to advance careers and working conditions. "It was through offers of advancement to more prestigious chairs... that professors normally achieved better budgets, if not for their old, then for their new institutes."¹³

Ash's explanation of the career problems of specialists in psychology is certainly cogent for the period after 1890. However, Wundt, G.E. Müller, and Stumpf all advanced to full professorships of philosophy in the 1870s and 1880s specifically on the strength of their work in experimental psychology. At that time philosophical faculties in many German universities took strong interest in the new field. The problem is that this interest began to wane in the 1890s.

Müller's importance as an experimental psychologist was increased by the success of his assistants and associates in Göttingen. They apparently worked more closely with him than Leipzig students did with Wundt, and their cleverness with apparatus often complemented the logical rigor of Müller's psychophysical interpretations. The first assistant, Friedrich Schumann, received the doctorate in physics, not philosophy, in 1885. He was already working with Müller when the Göttingen laboratory opened in 1887. In 1894 Schumann became Stumpf's first assistant in Berlin, where he supervised the laboratory work in psychology. Besides Schumann, G.E. Müller was assisted by the notable experimentalists Narziss Ach (1901-1904), Hans Rupp (1904-1907), and David Katz (1907-1918). (Oswald Külpe had also studied with Müller in the early 1880s, before Göttingen had a psychological laboratory.) The psychologists who studied with Müller in Göttingen and especially those who also worked with Stumpf in Berlin (Schumann, Ach, Rupp) later competed with Wundt's students for academic appointments.

As he trained these psychologists, Müller made substantial conceptual contributions to experimental psychology. With his rigor in discourse and in explanation for specific psychological problems, his example contrasted with Wundt's synthetic, flexible, occasionally confusing way of framing wide areas of psychology. Along with the work on theory and methods of psychophysics,¹⁴ Müller and his students improved Ebbinghaus's experiments on memory. Müller also studied the psychophysics and

¹³ Ash, *ibid.*, 275.

¹⁴ His definitive work is G.E. Müller, *Gesichtspunkte und Tatsachen der psychophysischen Methodik* (Wiesbaden: Bergmann, 1904).

physiology of vision, lending major support to Hering's theory of color vision and helping to establish it as the dominant one by 1900. Müller's style, in short, was to make more thorough studies of work which others had begun.

2. Hermann Ebbinghaus and his problems in Prussia.

Hermann Ebbinghaus (1850-1909) was an experimental psychologist of a more original stripe. He was one of the best writers in German psychology. His works, though few, were important, and his textbooks were particularly popular.¹⁵ Like Götze Martius, he wanted to establish experimental psychology in Prussian universities, and Wundt was supportive of those efforts. Ebbinghaus, however, eventually became identified with the anti-Wundtian movement, especially as editor of *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, the major forum for critics of Leipzig research.

Ebbinghaus opened his elementary text on psychology with the apt words: "Psychology has a long past, yet its real history is short."¹⁶ Ebbinghaus himself had almost no past in psychology—he was a self-starter. And as for his history, his career was a relatively short and troubled one. Early branded as a narrow specialist like G.E. Müller, Ebbinghaus never commanded enough academic prestige to promote experimental psychology as Wundt or even Müller did. His main influence resulted from his writings and from the journal that he edited. The trials and vicissitudes of his career paint a picture of the problems faced by experimental psychologists in Prussia, and more generally, in Germany as a whole.

The son of a Rhineland merchant, Ebbinghaus was brought up in the Protestant faith and attended the *Gymnasium* in his home town, Barmen. He entered the University of Bonn in 1867 and also studied in Halle and Berlin. History and philology were his early interests, but his focus gradually shifted to philosophy. After serving as a second lieutenant in the Franco-Prussian War, he returned to study philosophy at Bonn, receiving the doctorate in 1873 with a dissertation "On Hartmann's philosophy of the unconscious." A few years later, Wundt (somewhat reluctantly) was to recognize Eduard von

¹⁵ Hermann Ebbinghaus, *Grundzüge der Psychologie*, vol. 1 (Leipzig: Veit, 1902); *Abriss der Psychologie* (Leipzig: Veit, 1908). Ebbinghaus died before he could finish the second volume of his *Grundzüge*, but Ernst Dürr published it from notes in 1913, and edited a third edition of the first volume in 1911.

¹⁶ The English translation of *Abriss* was also popular: Hermann Ebbinghaus, *Psychology: An elementary text-book*, trans. Max Meyer (Boston: Heath, 1908).

Hartmann's book (1869) as one of the most influential recent philosophical works by a non-academic author.¹⁷ That popular writer may well have first led Ebbinghaus to consider psychological research. Nevertheless, he did not go to Lotze, as G.E. Müller and others did. Ebbinghaus studied mathematics and natural science for two years in Berlin, then traveled, sometimes working as a tutor, in France and England. He returned to Berlin in late 1878 to teach French to ten-year-old Prince Woldemar of Prussia, but six months later the prince died. In 1879 Ebbinghaus began an ambitious experimental project, the same year that advanced students began psychological experiments with Wundt in Leipzig.

With little more background in experimental psychology than his reading of Fechner's *Elemente der Psychophysik*,¹⁸ Ebbinghaus chose to research a problem of the older associationist psychology, memory. He developed an experimental method for studying this nonsensory area of psychology: a system of about 2300 nonsense syllables. Ebbinghaus served as his own and only subject for these experiments. He sat and learned sequences of the meaningless syllables and investigated learning, retention, forgetting, and relearning.

In 1880 Ebbinghaus presented his paper, "Ueber das Gedächtnis, Untersuchungen zur experimentellen Psychologie," for the habilitation in Berlin.¹⁹ His reviewers were the distinguished historian of philosophy, Eduard Zeller, and Hermann Helmholtz. Both had been in Heidelberg in the 1860s, when Wundt was there, and both had published on epistemology and psychology. They praised Ebbinghaus for his originality and his methodology, but criticized him for not drawing many conclusions from his investigation. Zeller was concerned that, except for the doctoral dissertation, Ebbinghaus's abilities as a philosopher were represented only by "this entirely specialized research" [diese so ganz spezielle Untersuchung].²⁰ Perhaps Ebbinghaus chose the topic of his trial lecture, "Berkeley's immaterialism,"

¹⁷ Wundt, "Philosophy in Germany," *Mind*, 2 (1877), 403-518; 505-508.

¹⁸ Legend has it that he happened upon Fechner's book in a Paris bookstall. The source of the story is Ebbinghaus's associate, Erich R. Jaensch, "Hermann Ebbinghaus," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 51 (1909), i-viii. Work with the Ebbinghaus Archive in Passau has led to some question about the accuracy of the story: Wolfgang G. Bringmann and Norma Bringmann, "Hermann Ebbinghaus, 1875-1879: The missing years," in *Internationaler Ebbinghaus Symposium, Passau, 1985*, ed. Werner Traxel (Passau: Passavia Verlag, 1986), in press.

¹⁹ Recently published as Hermann Ebbinghaus, *Ueber das Gedächtnis*, ed. Werner Traxel (Passau: Passavia Verlag, 1983). On Ebbinghaus's career at Berlin: Lothar Sprung and Helga Sprung, "Ebbinghaus an der Berliner Universität—ein akademisches Schicksal eines zu früh Geborenen?" in *Internationaler Ebbinghaus Symposium, Passau, 1985*, *op. cit.*

²⁰ Quoted in Sprung and Sprung, *ibid.*

to answer concerns that his interests were too narrow. Successfully habilitated, Ebbinghaus began offering courses in winter-semester 1880/81, including, though not restricted to, experimental psychology.

The next year, 1881, Lotze came to Berlin, only to die within a few months. Wilhelm Dilthey (1833-1911) succeeded him as professor of philosophy in 1883. In Breslau he had already been interested in experimental psychology and had recommended Wundt as his successor there.²¹ In Berlin Dilthey took a keen interest in his junior colleague and wrote to a friend, "I go walking every week with Ebbinghaus, and we philosophize then. He is the one person here who has the best and clearest knowledge of matters psychological." [Mit Ebbinghaus gehe ich wöchentlich spazieren und wir philosophieren dann. Er ist der welcher die besten und klarsten Kenntnisse psychologischer... Art hier hat.]²² In 1884 Ebbinghaus married. He continued to revise and extend his work on memory.

Ebbinghaus published his much improved study in 1885, its methodology sharpened and its results extended and clarified in an elegant monograph of 169 pages.²³ This version contained the equation relating memory retention to time elapsed since learning,²⁴ soon a staple of textbooks of psychology. As the Weber-Fechner law had given scientific credence to sensory psychology, this mathematical formula was the first empirical-mathematical expression of a "higher," or nonsensory psychological function.²⁵

In early 1886 Dilthey and Zeller supported Ebbinghaus's appointment as Professor Extraordinarius in Berlin. Dilthey's recommendation notes:

Dr. Ebbinghaus has chiefly dedicated himself to the task of making psychology more accessible to an experimental treatment, and to this end to increase the number of clearly defined, where possible, quantitative, results for psychology.

²¹ Wilhelm Dilthey to Friedrich Althoff, 29 March 1883, Zentrales Staatsarchiv Merseberg, Signatur: Rep 92 Althoff, B Nr 29 Bd 2, Bl. 109a-100b.

²² Wilhelm Dilthey to Paul York von Wartenburg, [1883], in Erich Rothacker, ed., *Briefwechsel zwischen Wilhelm Dilthey und dem Grafen Paul York von Wartenburg 1877-1897* (Halle: Niemeyer, 1923), 38.

²³ Hermann Ebbinghaus, *Ueber das Gedächtnis, Untersuchungen zur experimentellen Psychologie* (Leipzig: Duncker und Humblot, 1885). English edition, *Memory: A contribution to experimental psychology*, trans. Henry A. Ruger and Clara E. Bussenius (NY: Teachers College, Columbia U., 1913); reprinted, with foreword by Ernest Hilgard (NY: Dover, 1964).

²⁴ In German original, *op. cit.*, 105.

²⁵ For a review of early memory research: Leo Postman, "Human learning and memory," in *Topics in the history of psychology*, ed. Gregory A. Kimble and Kurt Schlesinger, vol. 1 (Hillsdale, NJ: Lawrence Erlbaum, 1985), 69-133.

[Herr Dr. Ebbinghaus hat sich vornehmlich der Aufgabe gewidmet, die Psychologie einen experimentellen Behandlung mehr zugänglich zu machen u. so die Zahl von klar umgrenzten, wo möglich quantitativ bestimmten Ergebnissen derselben zu vermehren.]²⁶

Dilthey's interest in the new psychology and the success of Ebbinghaus's book on memory meant that experimental psychology had good prospects at Berlin University.

Ebbinghaus's appointment also marked the beginning of the Berlin psychological laboratory: his contract specified obligations to give lectures on psychology and aesthetics and "exercises in experimental psychology" [Übungen auf dem Gebiete der experimentelle Psychologie]. For the purpose of these exercises he received two rooms on the ground floor of Dorotheenstrasse 5 (today Clara-Zetkin-Strasse) and, up to the time he left eight years later, a very modest total of 1600 marks for apparatus.²⁷ (Wundt, by contrast, was then receiving 1200 marks each year for purchase of equipment.) By the early 1890s Ebbinghaus had written a proposal for a huge psychological institute in Berlin and his students had founded a "Verein für wissenschaftliche Psychologie." They made Ebbinghaus an honorary member in 1894, the year he left the Prussian capital.

It was Carl Stumpf, though, and not Ebbinghaus, who made Berlin an important center for experimental research in psychology. This displacement of Ebbinghaus in favor of Stumpf, a turning point in the history of psychology in Germany, was orchestrated by conservative forces in German philosophy, particularly by the man who had once been so interested in Ebbinghaus and the new psychology--Dilthey. Before discussing that episode and Stumpf's career in general, we examine the general climate for psychology in Germany by looking at one more Prussian professor of philosophy.

3. Benno Erdmann, temporary experimental psychologist.

Benno Erdmann (1851-1921), a contemporary of G.E. Müller and Ebbinghaus, was less well-known as a psychologist than as a neo-Kantian philosopher who wrote influential philological studies of Kant's writings. Yet Erdmann also participated in the movement to bring experimental work into philosophy. A minor psychologist, he was, like Dilthey, a prominent main-stream philosopher who took an interest in experimental work in the 1880s. Unlike Dilthey, he actually engaged in experimentation for

²⁶ Quoted in Sprung and Sprung, *op. cit.*

²⁷ Sprung and Sprung, *ibid.*

a few years. The fluctuations in Erdmann's interest are symptomatic of the changing fortunes of late-nineteenth-century psychology in Germany.

Erdmann studied at Heidelberg, then transferred to Berlin in 1871, the year Helmholtz made the same move.²⁸ Helmholtz had probably interested him in psychology of perception by this time, but Erdmann's doctoral dissertation (1873) was a study of Kant with Eduard Zeller. The habilitation (1877) with Helmholtz was an essay on non-Euclidean geometry, a topic to which Helmholtz had contributed significantly more than a decade earlier. In 1879 Erdmann reviewed Ribot's book on German psychology for Avenarius's journal. He took the opportunity to charge Wundt with borrowing, without acknowledgment, his theory of unconscious inference from Helmholtz. Wundt, of course, protested that his use of the term was original.²⁹

Erdmann's career, entirely in Prussia, oscillated between Kantian studies and the new psychology. In 1879 he became full professor at Kiel. He was called to Breslau in 1884, as Dilthey moved to Berlin from that position, and as Wundt turned it down in exchange for better conditions in Leipzig. The circumstances of this *Berufung* suggest why, in 1885, Erdmann began getting grants to equip a psychological laboratory at Breslau, and why the next year he published a paper on apperception.³⁰

Erdmann was slow to contribute anything original to experimental psychology. His theory of apperception, in fact, was more Herbartian and less experiment-oriented than Wundt's. When he went to Halle in 1890, nevertheless, he took his equipment with him. As Stumpf's successor there, he lectured on psychology and in 1893 started publishing a monograph series for his doctoral students and his associates. Most of those publications were historical or philological; a few were theoretical studies in psychology; the eighth number was the doctoral dissertation of an outstanding experimentalist from America, Raymond Dodge (1871-1942).³¹

²⁸ On Erdmann's life and career: *Neue Deutsche Biographie*, 4, 570-571; and Erich Becher, "Benno Erdmann," *Archiv für die gesamte Psychologie*, 42 (1921), 150-182.

²⁹ Benno Erdmann, "Zur zeitgenössischen Psychologie in Deutschland," *Vierteljahrsschrift für wissenschaftliche Philosophie*, 3 (1879), 377-407; Wundt, "Berichtigende Bemerkung zu dem Aufsätze des Herrn B. Erdmann," *ibid.*, 4 (1880), 135-136.

³⁰ Benno Erdmann, "Zur Theorie der Apperzeption," *Vierteljahrsschrift für wissenschaftliche Philosophie*, 10 (1886).

³¹ Raymond Dodge, "Die motorische Wortstellung," *Abhandlungen zur Philosophie und ihre Geschichte*, Nr. 8 (1896).

The collaboration with the American student put Erdmann's name into the literature of experimental psychology. Dodge's method for recording reflections of a beam of light off the cornea enabled these two to study eye movement during reading. Their joint publication in 1898 described the patterns of jumps and stops that they observed.³²

Also in 1898, Erdmann was called to Bonn to succeed Jürgen Bona Meyer, the teacher of Theodor Lipps and Götz Martius. Lipps was already professor at Munich, and Martius had been running a psychological laboratory at Bonn for nearly a decade. It was a disappointment for Wundt to see Martius passed over,³³ but the outcome in Bonn made him very aware that Prussian administrators would give preference only to experimental psychologists who were also accomplished in other areas of philosophy. At that point Martius was still Extraordinarius and had published only experimental research,³⁴ whereas Erdmann had been professor since 1879 and had a list of Kant studies to his credit prior to the appearance of his experimental work. Wundt's irritation was relieved somewhat when Martius took a full professorship at Kiel and managed to start a psychological laboratory there.³⁵

That Dodge continued experimental work and Erdmann soon gave it up typifies the difference, at that point, between independent, professional psychology in the United States and psychology as part of philosophy in Germany. As professor of psychology at Wesleyan University from 1897 to 1923, Dodge continued studying eye movement and building his reputation as an experimentalist. In his later years he helped resurrect experimental psychology at Yale, dormant for nearly twenty years following the dismissals of Ladd and Scripture. Yale's new president at that time was the psychologist James Rowland Angell (1869-1949), who, incidentally, had studied with Erdmann for one semester in 1893.

Erdmann worked in Bonn until 1909, then joined Stumpf, Dilthey, and Alois Riehl at Berlin. Külpe replaced Erdmann in Bonn. Until he went to Berlin, Erdmann clearly identified himself as one of the specialists in psychology among the Prussian philosophers. Yet except for the two papers with

³² Benno Erdmann and Raymond Dodge, *Die psychologische Untersuchungen über das Lesen auf experimentelle Grundlage* (Halle: Niemeyer, 1898); also by the same authors, "Zur Erläuterung unserer tachistoskopischen Versuche," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 22 (1900), 241-267.

³³ Wundt to Ernst Meumann, 15 January 1898, UAL, Wundt Nachlass, Nr. 701.

³⁴ For his bibliography, see "Götz Martius," in *Die Philosophie der Gegenwart in Selbstdarstellungen*, ed. Raymond Schmidt, vol. 3 (Leipzig: Felix Meiner, 1922), 99-120.

³⁵ Wundt to Ernst Meumann, 11 April 1898, UAL, Wundt Nachlass, Nr. 702.

Dodge, he published no original experiments.³⁶

Erdmann represents a limiting case of a psychologist in the generation following Wundt--after a flirtation with experimental work he returned to more traditional approaches to philosophy. In Breslau in the mid-1880s, as pinch-hitter for Wundt, he saw the need to engage in experimental work. By the time he published with Dodge in 1898, however, the heyday of early experimental psychology had passed in Germany, and a period of reevaluation, if not crisis, had set in.

B. The philosophical side: Brentano, Austria, Stumpf, and the changing relationship between philosophy and psychology.

Carl Stumpf (1848-1936) and Wundt were, both by background and temperament, very different, and their notorious rivalry in psychology reflected differing views of philosophy and of psychology's role in it. Wundt was born in a Calvinist parsonage in Baden; Stumpf to a medical family in Catholic Bavaria. Wundt was trained in medicine and experimental science; Stumpf studied philosophy. Wundt espoused experimental psychology as the methodological propaedeutic to a new scientific philosophy, and consequently conceived of it as a wide area of study. Stumpf experimented in a limited area where he was expert. The rigor of Stumpf's experimental work and his pristine philosophical prose make Wundt's writings in philosophy and psychology look heaped up and overwrought by comparison. The Comtean spirit brought Stumpf to experimental psychology, as it did Wundt, but Stumpf was receptive to the trends of thought which were weakening the fruitful marriage of German idealism and the Comtean spirit. Philosophy and psychology both became more exact and more technical, less general and less dependent upon each other. To say that Stumpf was receptive to these trends does not mean that he motivated or always represented them in his own work. He was a specialist in acoustical psychology, but as head of psychology in Berlin he was a tolerant generalist. His loose supervision of his younger colleagues made him an institute director who was, ironically, more like Wundt than like G.E. Müller.

Born near Würzburg in 1848 to a family that had physicians on both sides, Stumpf had early exposure to the natural sciences.³⁷ But music was his first and, as it turned out, his abiding love. Since

³⁶ Erdmann's final and largest work on psychology was almost entirely theoretical, with a few references to experimentation: Benno Erdmann, *Grundzüge der Reproduktionspsychologie* (Berlin: De Gruyter, 1920).

³⁷ "Carl Stumpf," in *The history of psychology in autobiography*, ed. Carl Murchison, vol. 1 (Worcester, MA:

there were no university degrees in music, Stumpf entered Würzburg University in 1865 to study philosophy, especially aesthetics. During his second semester there a priest named Brentano habilitated in philosophy.

Franz Brentano (1838-1917) had an impact on Stumpf and eventually also on the general development of psychology and philosophy in Germany and Austria.³⁸ Brentano's habilitation essay on Aristotle's psychology was applauded as the best at Würzburg in at least fifty years, and the customary ceremony of the public defence attracted considerable attention. His early writings were part of a revival of Aristotelean philosophy in Germany, but Brentano could scarcely be described as backward-looking. He tread a thin line between the disapproving religious orthodoxy and suspicious liberals, defending one Latin thesis which read, "The true method of philosophy is none other than that of the natural sciences. [Vera philosophiae methodus nulla alia nisi scientiae naturalis est.]" The scene made an indelible impression on young Stumpf.³⁹ For the sake of the new philosophy, he even tried to do experiments in chemistry, but he quit the laboratory after he accidentally started a fire. "I never attained manual cleverness," he later remarked.⁴⁰ That a young musician should be inspired by a priest to do experimental chemistry for philosophy's sake seems far-fetched today, but that picture portrays the optimistic Comtean spirit which then prevailed among German intellectuals. Brentano, incidentally, wrote an essay favorable to Comte, at a time when Catholic authorities had not forgotten how the Frenchman's later writings promoted a pseudo-religion of science.⁴¹

In his fifth semester, Stumpf's teacher (as he always reverently called Brentano) sent him to Lotze in Göttingen. Stumpf received the doctorate there in 1868 and returned to Würzburg for more study with Brentano. He entered the theological seminary to prepare to be a priest like his teacher. Together in Würzburg they, like liberal Catholics everywhere, suffered the disappointment of the Vatican

Clark U. Press, 1930), 389-441.

³⁸ There is considerable literature on Brentano. For an introduction, see Antos C. Rancurello, *A study of Franz Brentano: His psychological standpoint and his significance in the history of psychology* (NY: Academic Press, 1968); and Linda A. McAlister, ed., *The philosophy of Brentano* (London: Routledge, 1976).

³⁹ Carl Stumpf, "Erinnerungen an Franz Brentano," in *Franz Brentano, zur Kenntnis seines Lebens und seiner Lehre*, ed. Oskar Kraus (Munich, 1919), 85-149.

⁴⁰ "Carl Stumpf," in *The history of psychology in autobiography, op. cit.*, vol. 1, 389-441.

⁴¹ Franz Brentano, "Auguste Comte und die positive Philosophie," *Chilaneum: Blätter für katholische Philosophie, Kunst, und Leben*, Neue Folge, 2 (1869), 15-37; reprinted in Franz Brentano, *Die vier Phasen der Philosophie*, ed. O. Kraus (Leipzig: Felix Meiner, 1926), 97-133.

Council's definition of papal infallibility in early 1870. That decision was part of the Catholic leadership's general turn toward conservatism and toward greater control by Rome. In Germany another conservative, Chancellor Bismarck, soon launched his *Kulturkampf* to reduce Catholic control of institutions in the new German Reich.

Stumpf had not yet taken vows, so he simply cast off his black robes and habilitated in Göttingen in 1870, presenting a study of mathematical axioms. As Privatdozent in Göttingen, Stumpf enjoyed further contact with Lotze and made the acquaintance of the fathers of psychophysics from Leipzig. E.H. Weber taught him to do tactile experiments, and he discussed experiments on aesthetics with Fechner. Stumpf published his first important psychological work, *Ueber den psychologischen Ursprung der Raumvorstellung*, in 1873. Perception of space was, of course, a favorite topic of Lotze's, but Stumpf's analysis was nativist whereas Lotze's was empiricist.⁴²

Also in 1873, Brentano left Würzburg and the priesthood. Stumpf succeeded him at age twenty-five, six years younger than G.E. Müller was when he replaced Lotze at Göttingen. Soon Brentano published his major book on psychology,⁴³ shortly after the first physiological chapters of Wundt's *Grundzüge* appeared. Brentano did not reject experimental methods in psychology, but he outlined an "empirical" approach which encompassed, like Aristotle's, more than the simple relationships he saw in Wundt's physiological psychology.

Religiously conservative laws forced the ex-priest to leave the Bavarian university, but Lotze's recommendation helped secure Brentano the Ordinarius in philosophy at Vienna, where the audience for his ideas was larger and more receptive. During most of the 1870s, liberals held political control in Vienna, and the Comtean spirit ruled philosophy and science in the Austrian cosmopolis: "Brentano's identification of the philosophical and scientific methods, combined with his commitment to religion outside the traditional institutions of the Church, provided the ideal support for the liberal program."⁴⁴ The

⁴² William R. Woodward, "From association to Gestalt: The fate of Hermann Lotze's theory of spacial perception, 1846-1920," *Isis*, 69 (1978), 572-582.

⁴³ Franz Brentano, *Psychologie vom empirischen Standpunkt* (Leipzig: Duncker & Humblot, 1874). English version: *Psychology from an empirical standpoint*, trans. A. Rancurello, D. B. Terrell, and L. McAlister (NY: Humanities Press, 1973).

⁴⁴ David F. Lindenfeld, *The transformation of positivism: Alexis Meinong and European thought, 1880-1920* (Berkeley: U. of California Press, 1980), 44-45.

liberals were out of power when Brentano decided to marry in 1880. Under Austrian law an ex-priest could not marry, so Brentano gave up his Austrian citizenship and with it his professorship. With only the status of Privatdozent, he continued to lecture in Vienna until 1894, when his wife died and he withdrew to Italy and life as a private scholar. During his twenty years in Vienna, many future philosophers and intellectuals--among them Alexius Meinong, Edmund Husserl, and Sigmund Freud--flocked to Brentano's lectures.

Brentano was an important teacher who inspired--though did not author--most of the major trends in twentieth-century Western philosophy. Meinong worked on analysis of language, an approach which Bertrand Russell, G.E. Moore, and Ludwig Wittgenstein developed into analytical philosophy. Husserl first investigated then criticized Brentano's psychological foundation for logic, and phenomenology was born as a philosophical movement.⁴⁵ Stumpf, who eventually became father figure to the Gestalt movement in Berlin, was the most important psychologist among Brentano's students.

After spending six stormy years of the *Kulturkampf* at Würzburg, Stumpf worked in several Austrian and German universities, steadily working his way up to the peak of his profession as a philosopher. In 1879, he went to the University of Prague in the Austrian Empire. During his five years there, as Wundt was organizing the Institute in Leipzig, Stumpf was the colleague of Ernst Mach and Ewald Hering. He was also visited by William James, who became a friend and an ally in psychological matters. From 1884 to 1885 Stumpf was professor in Prussia, at the University of Halle, where Brentano sent Husserl to habilitate.

In spite of the proximity of Halle and Leipzig, there were no neighborly contacts between Wundt and Stumpf, as Cattell learned when he asked Wundt for an introduction: "He said that he was sorry that he could not give it; he was not personally acquainted with Stumpf; it was better so, for there might be scientific subjects on which they would differ and then each could speak more freely. This did happen later, and each did tell the truth as he saw it without violating the courtesy that personal acquaintance might from their point of view have required."⁴⁶ This tortured euphemism alluded to an

⁴⁵ On Meinong, see Lindenfeld, *ibid.* On Husserl, see Martin Farber, *The foundations of phenomenology: Edmund Husserl and the quest for a rigorous science of philosophy* (Albany: State U. of New York Press, 1943), esp. 3-136.

⁴⁶ James McKeen Cattell, in Bird T. Baldwin, ed., "In Memory of Wilhelm Wundt," *Psychological review*, 28 (1921), 153-188. Reprinted in *Wundt studies, a centennial collection*, ed. Wolfgang G. Bringmann and Ryan D. Twe-

acrimonious debate between Wundt and Stumpf, of which more soon. Perhaps Wundt had already seen a fight coming in 1884, when he reviewed the first volume of Stumpf's *Tonpsychologie*.⁴⁷

From 1889 to 1894 Stumpf was back in Bavaria, at Munich, where he had his first psychological laboratory in university quarters. It was a small one, fitted mainly with tuning forks and other acoustical equipment. From Munich he was called to Berlin University, where he spent the rest of his career as the senior representative of experimental psychology.

Stumpf's work as an experimentalist, up to the time he went to Berlin, was dedicated to producing his *Tonpsychologie*. That work combined his love of music with philosophy and the modern, experimental approaches to mental phenomena. He started this work in 1875 as a Privatdozent in Göttingen, using acoustical instruments in Friedrich Kohlrausch's institute of physics. The first volume of *Tonpsychologie* (on isolated tones) appeared in 1883, the second volume (on tone combinations) in 1890. Stumpf originally planned a third volume to cover consonance, dissonance, chords and melodies (i.e., music per se) and a fourth volume on "tonal feeling" [Tongefühl].⁴⁸ Once he arrived in Berlin, however, the publication format changed, and he issued nine volumes of *Beiträge zur Akustik und Musikwissenschaft* (1898-1924), which contained papers by his students as well as his own work.

With only a few exceptions, all of Stumpf's publications in psychology concerned work on tones.⁴⁹ Yet scattered throughout these were critical discussions of theoretical issues and original contributions to psychophysical methods and mathematical analysis. Thus, though concentrated on a limited area, Stumpf's research had importance for the wider field of psychology.

Inevitably, Stumpf's critical remarks were often directed against Wundt and his students, since Leipzig researchers produced such a large proportion of the psychological literature of the 1880s and early 1890s. The public debate between Wundt and Stumpf got off to an energetic start in 1890, in the premier issue of a new journal of psychology.

ney (Toronto: Hogrefe, 1980), 280-308; 283-284.

⁴⁷ Wundt, [review of Stumpf, *Tonpsychologie*], *Literarisches Zentralblatt für Deutschland*, 1884, Col. 567.

⁴⁸ Carl Stumpf, "Selbstanzeige für *Tonpsychologie*. 2." *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 345-351.

⁴⁹ For his bibliography (up to the last decade of his life): "Carl Stumpf," in *Die Philosophie der Gegenwart in Selbstdarstellungen*, ed. Raymund Schmidt, vol. 5 (Leipzig: Felix Meiner, 1924), 205-265.

C. The new *Zeitschrift*, 1890.

1. The need for a new journal of psychology.

During most of the 1880s, Wundt's *Philosophische Studien* was the only journal anywhere that specialized in experimental psychology. It also included many theoretical and philosophical articles, most of them written by Wundt. Work by G.E. Müller, Stumpf, and Ebbinghaus did not appear in Wundt's journal. Indeed, it was only after there were other psychology journals that Wundt began to print direct responses from his critics.⁵⁰

These younger, excluded psychologists eventually required a new journal. In the United States, G. Stanley Hall founded the *American journal of psychology* in 1887. But who would begin another one in Germany? Ebbinghaus, Professor Extraordinarius in Berlin, was a natural choice for the task. There was at least one other likely candidate—a full professor trying to break into psychological research, Benno Erdmann.

Evidence for this suggestion comes from a draft letter in the Ebbinghaus papers that does not name the addressee but gives strong clues that it was Erdmann. The unnamed colleague was preparing to move to Halle, the letter mentions—this was March 1890, a few months before Erdmann made that move from Breslau. Ebbinghaus wrote,

I feel obliged to inform you that the project of a psychophysiological journal, which we conceived independently of one another and which we discussed together last Easter holiday, is about to be realized.

Soon after our discussion, I incidentally asked Credner⁵¹ whether he were inclined to carry out the plan with you. Since he answered in the affirmative, I did not pursue the matter any further. Then my colleague here, Professor Arthur König (formerly assistant to Helmholtz and now to Dubois) together with J.E. Maahs (of Leopold Voss publishers) requested me to assume the editorship of the psychological part of a journal to be founded for sensory physiology and exact psychology. I called the gentlemen's attention to the fact that, as far as I knew, a similar undertaking had already been planned for the near future, and that it was therefore possible that even if the idea was ripe for the public, the journal would arrive on the scene too late or would immediately be embroiled in bitter competition. Since they were determined to do it in any case, I finally accepted.

⁵⁰ The first was probably Wilhelm Jerusalem, "Ein Beispiel von Association durch unbewusste Mittelglieder," *Philosophische Studien*, 10 (1894), 323-325.

⁵¹ Presumably Hermann Credner, owner of Verlag-Buchhandlung Veit & Co., Leipzig. See Hermann A.L. Degener, ed., *Wer ist's? Unsere Zeitgenossen*, vol. 1 (Leipzig: H.A. Ludwig Degener, [1905]), 140.

To this point, everywhere we have sought support, we have found ready cooperation. Helmholtz and Hering, the antipodes, will take us into their protection; Aubert, Exner, Müller, Stumpf, and others join them.⁵²

I hope you will not be surprised and angry with me that I only now tell you all this and also only now seek your support. After I had declared myself ready for the undertaking, I was obliged to consider the business interests of the publisher and was forced by his wishes to treat the project as a business secret during the preparatory stages.

I hope, however, that it is still not too late for me to ask you sincerely to extend to us your interest, and particularly your collaboration, understandably only insofar as that is not detrimental to plans you may have for establishing your own journal.

[Ich halte mich für verpflichtet, Ihnen mitzuteilen, dass das Projekt einer psychophysiologischen Zeitschrift, welches wir unabhängig von einander ausgedacht hatten u. in den vorigen Osterferien zusammen besprochen, seiner Verwirklichung entgegengeht.

Bald nach unserer Unterredung hatte ich gelegentlich bei Credner angefragt, ob er gesonnen sei, den Plan mit Ihnen zur Ausführung zu bringen. Als er bejahend antwortete, verfolgte ich meinerseits die Sache nicht weiter, wurde aber dann vor einigen Wochen zuzusagen von ihr verfolgt. Mein hiesiger College nämlich, Prof. Arth. König, der ehemalige Assistent von Helmholtz u. jetzige von Dubois, im Verein mit J.E. Maahs (Leop. Voss) forderte mich auf, an einer zu begründenden Zeitschrift für Sinnesphysiologie u. exakte Psychologie die Redaktion des psychologischen Teils zu übernehmen. Ich machte die Herren darauf aufmerksam, dass wie mir bekannt sei, für sehr nahe Zeit schon ein ähnliches Unternehmen geplant sei, u. dass also möglicherweise, wenn die Sache für die Öffentlichkeit reif sei, sie bereits zu spät kommen oder gleich in einen erbitterten Konkurrenzkampf verwickelt werde. Da sie aber jedenfalls entschlossen waren, etwas derartiges zu machen, nahm ich schliesslich an.

Überall wohin wir uns bis jetzt um Unterstützung gewandt haben, haben wir die bereitwilligen Zusagen erhalten. Helmholtz u. Hering, die Antipoden, wollen uns unter ihren Schutz nehmen; Aubert, Exner, Müller, Stumpf u.A. schliessen sich ihnen an.

Sie wollen nicht verwundert u. mir namentlich nicht böse sein, dass ich Ihnen von dem Allen erst jetzt Mitteilung mache u. mich erst jetzt auch um Ihre Unterstützung bemühe. Denn nachdem ich mich einmal zu dem Unternehmen bereit erklärt hatte, wurde ich auf die geschäftlichen Interessen des Verlegers verpflichtet u. war nach seinem Wunsche gezwungen, das Projekt während der vorbereitenden Stadien als Geschäftsgeheimnis zu behandeln.

Ich hoffe aber noch nicht zu spät zu kommen, wenn ich Sie jetzt noch herzlich bitte, uns ebenfalls Ihr Interesse u. namentlich auch Ihre Mitarbeit zuzuwenden, selbstverständlich nur, soweit Ihren etwaigen Plänen zur Begründung einer eigenen Zeitschrift dadurch nicht Abbruch geschieht.]⁵³

The letter ended with the remark that Wundt too was "kindly disposed toward the project [stellt sich...sehr freundlich zu der Sache]," although in the interest of his *Philosophische Studien* he could understandably take no direct part. Ebbinghaus wrote to thank Wundt for his "friendly lines of March 5th," and to ask that Institute Assistant Külpe provide the new journal with reports on research under

⁵² Collaborating editors missing from this list are Johannes von Kries, Theodor Lipps, and William Preyer. Ebbinghaus could scarcely have been writing to any of them, since none of them had anything to do with Halle.

⁵³ Hermann Ebbinghaus to unnamed colleague [Benno Erdmann], draft, 12 March 1890, Universität Passau, Institut für Geschichte der Neueren Psychologie, Hermann Ebbinghaus Archiv, Nr. 232a.

way in the Leipzig laboratory, in order to “document the neighborly relationship” between the two journals.⁵⁴ Such regular reports never appeared; and the neighborly relations were not so good, as it turned out.

Erdmann did not become a collaborating editor of the *Zeitschrift*, nor did he publish his own journal of psychology. He did, however, start a monograph series in 1893, and he became an important co-editor of Paul Natorp’s *Archiv für systematische Philosophie*, starting 1895.

Whether or not Ebbinghaus’s letter actually reached Erdmann in this form, the draft casts light on the purposes of the backers of the new journal for psychology. The indications are clear that König and the physiologists (presumably including Helmholtz) strongly supported, perhaps even motivated the project. Arthur König (1856-1901), a close associate of Helmholtz,⁵⁵ got his doctorate in physics in 1882 and worked almost exclusively in physiological optics, psychophysics, and physiology of sense organs. In 1889 he became full professor and head of the Physics Division of the Physiological Institute at Berlin University. The Institute’s director, as Ebbinghaus mentioned, was Emil du Bois-Reymond. König was in a good position to ensure that the new journal would take notice of important work in sensory physiology.

Ebbinghaus, however, was the primary editor of the *Zeitschrift*, and he wrote the preface to the first volume. The study of psychic processes, he noted, had enjoyed much progress in recent years, partly due to advances in physiology. By the same token, sensory physiologists were investigating areas that required better knowledge of psychic processes. “Until now the numerous workers in this double area have had no single publication available to them; they tended to publish their results in physiological, philosophical, physical, medical and other journals, according to their particular connections.” [Bisher hat den zahlreichen Arbeiten auf diesem Doppelgebiet kein eigenes Organ zur Verfügung gestanden; sie pflegen daher ihre Resultate je nach ihren sonstigen Beziehungen in physiologischen, philosophischen, physikalischen, medizinischen und anderen Zeitschriften niederzulegen.]⁵⁶ The new journal

⁵⁴ Hermann Ebbinghaus to Wundt, [April 1890], UAL, Wundt Nachlass, Nr. 1142.

⁵⁵ Arthur König edited the posthumous second edition of Helmholtz’s *Handbuch der physiologischen Optik* (1896) and brought its bibliography up to nearly 8000 titles. From 1889 to his death in 1901, König was also editor of *Verhandlungen der Deutschen Physikalischen Gesellschaft*, the historic organization that du Bois-Reymond chaired from 1849 to his death in 1896, and in which Helmholtz, upon his return to Berlin in 1871, played a leading role, as he had in his student days.

meant to serve a single field of scientific research, which could be described as psychology plus the physiology relevant to sensory and psychic processes.

Ebbinghaus's preface did not mention Wundt nor did it distinguish the new journal's program from Wundt's point of view. Ebbinghaus's omission implied, however, that the *Philosophische Studien* failed to cover the developments in sensory physiology that were pertinent to modern psychology. In this connection, it is worth noting that six of the nine original collaborating editors of the *Zeitschrift* were professors of physiology (in the case of Helmholtz, physics) rather than professors of philosophy.

Beyond the preface, the anti-Wundtian tilt is no longer only tacit. Of the three collaborating editors who were professors of philosophy, Theodor Lipps contributed a non-polemical article, and G.E. Müller contributed no article at all for several years. His assistant Schumann, however, directly challenged the Leipzig laboratory, as did the third professor of philosophy on the editorial board, Stumpf of Munich.

2. The attacks on Wundt.

Carl Stumpf and Friedrich Schumann led the assault on Leipzig psychology, as Hugo Münsterberg and G.E. Müller stood in the background. Since most of these challenges to Wundt involved acoustical experiments, Stumpf in particular was able to play his strong hand.

The vicious exchange between Wundt and Stumpf (three articles apiece) became well-known and was long-remembered by psychologists.⁵⁷ The immediate issue was the doctoral dissertation of Carl Lorenz, Wundt's *Famulus* in the mid-1880s. Lorenz and Wundt found that subjects, asked to choose the tone that bisected the interval between two given tones, tended toward the arithmetic mean, rather than the geometric mean, of the two given vibration frequencies.⁵⁸ The finding is interesting, since the Fechner Law and the theory of musical intervals are both based on geometric relations.

Lorenz compiled more than 110,000 judgments from nine subjects--some musically talented, oth-

⁵⁶ Hermann Ebbinghaus, "Zur Einführung," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 1-4; 3.

⁵⁷ Edwin G. Boring, "The psychology of controversy," *Psychological review*, 36 (1929), 97-121; 107.

⁵⁸ Carl Lorenz, "Untersuchungen über die Auffassung von Tondistanzen," *Philosophische Studien*, 6 (1891), 26-103.

ers less so, and two decidedly unmusical. He tried to minimize the influence of musical chord perception (which follows geometric relations) and to focus the experiments on sense-distances for pitch rather than on perception of musical intervals. Stumpf held that this separation was impossible and considered the extensive series of experiments to be a waste of time. He particularly criticized Lorenz for giving judgments of unmusical subjects equal weight with those of expert musicians.⁵⁹

Out of the complicated arguments on psychophysical methods emerged some characteristic differences between Wundt's and Stumpf's approaches to experimental psychology. On the organizational side, Wundt directed a sizable institute, whose participants experimented in many areas in order to discover facts that verified and occasionally modified Wundt's theoretical framework; Stumpf was working alone, using experiment more to demonstrate than to discover, in the narrow field of tonal studies. On the theoretical level, Wundt and Stumpf also differed. Stumpf found the geometric relation to be self-evident in his experience of music and tones, and easy to demonstrate in the laboratory; he was not directly concerned about general interpretations of the Psychophysical Law. Wundt had his psychological interpretation of Fechner's Law to consider--every quantitative relationship that departed from the Psychophysical Law added proof that it was not an iron-clad physiological relation, but rather a psychic relation applicable to some but not all sensory phenomena. Wundt later made these implications clear in his discussion of Lorenz's experiment in the fifth edition of *Grundzüge*,⁶⁰ but in the debate with Stumpf, the larger issues were obscured by details of the experiments--and by personal invective.

And what invective! Stumpf criticized Wundt for accepting the geometric relation in his early writings and then switching unceremoniously to the arithmetic one. Wundt defended his right to change his mind over the course of twenty years, but his defense was pointedly unkind to the former Catholic seminarian: "Shouldn't I have tried to learn something? Or is experimental psychology as unchangeable as the philosophy of St. Thomas?" [Und hätte ich mich hier etwa nicht sollen belehren lassen? Oder ist die experimentelle Psychologie so unwandelbar wie die Philosophie des heiligen Thomas?]⁶¹

⁵⁹ Carl Stumpf, "Über Vergleichen von Tondistanzen," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*. 1 (1890), 419-485.

⁶⁰ Wundt, *Grundzüge der physiologischen Psychologie*, vol. 2 (5th ed. Leipzig: Engelmann, 1903), 73.

⁶¹ Wundt, "Ueber Vergleichen von Tondistanzen," *Philosophische Studien*. 6 (1891), 605-641; 614.

Wundt's vision of psychology as a cumulative, "positive" science (in Comte's sense of the word) is apparent here, as is his tendency to find "scholasticism" in the thinking of his opponents. Stumpf, not to be outdone, dragged up from the past the irrelevant Wundt-Hering exchange on the horopter. By recalling Wundt's mathematical error during that dispute, Stumpf implied that Wundt was incompetent.⁶² Wundt snapped back: he could forgive an error in mathematics, which is easily corrected; he could even excuse lack of knowledge of psychophysics; but lack of knowledge combined with arrogance [die Unwissenheit, die sich mit Ueberhebung verbindet] was unforgivable.⁶³

In their final pieces Wundt and Stumpf agreed that their controversy could not be resolved.⁶⁴ Clearly, they had very different conceptions of the problem. To Stumpf tone and music were of a piece; for Wundt they could be separated—tonal perception is directly accessible to experimental methods whereas musical experience, dependent on more complicated psychic functions, is not directly accessible.

In addition to starting the battle with Stumpf, the premier volume of the *Zeitschrift* inaugurated Wundt's running debate with Friedrich Schumann, G.E. Müller's assistant at Göttingen. Again Wundt was challenged to defend a Leipzig doctoral dissertation, that of Georg Dietze, published six years previously.

Dietze's experiment was the comparison of two groups of pendulum beats divided by the sound of a bell; subjects judged whether the two series matched. Requiring a minimum 80 percent accuracy, Dietze determined the optimum tempo for the beats (every .2-.3 sec) and the inevitability of rhythmic grouping. He determined the "capacity of consciousness" [Bewusstseinsumfang] at optimum tempo to be of the order of eight groups of two beats or five groups of eight beats on each side of the bell signal.⁶⁵

⁶² Carl Stumpf, "Wundts Antikritik," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 266-93; 288.

⁶³ Wundt, "Eine Replik C. Stumpfs," *Philosophische Studien*, 7 (1892), 298-327; 319.

⁶⁴ Carl Stumpf, "Mein Schlusswort gegen Wundt," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 438-443; Wundt, "Auch ein Schlusswort," *Philosophische Studien*, 7 (1892), 633-636.

⁶⁵ Georg W. Dietze, "Untersuchungen über den Umfang des Bewusstseins bei regelmässig auf einander folgenden Schallempfindungen," *Philosophische Studien*, 2 (1884), 362-393.

Schumann discussed Dietze's findings in terms of memory rather than apperception.⁶⁶ Self-observation told Schumann (and, as he took care to point out, also G.E. Müller) that contiguous apperception of two whole series was not a good description of the experience. Schumann suggested instead that a memory of each separate beat of the first series was matched to each beat as it occurred in the second series, gradually building a feeling of agreement if the two series matched.⁶⁷

For methodological and theoretical reasons, Wundt rejected Schumann's description and maintained his language of "span of apperception."⁶⁸ Simple psychic acts are directly accessible to quantitative experiment, according to Wundt, if they consist of fairly straightforward processing of incoming information. In that case, apperceptive action is the only assumption necessary. Schumann's explanation, it seemed to Wundt, required psychic action both on incoming information and on that retrieved from memory. Wundt criticized Schumann for postulating that memory has "the ability to count beats."⁶⁹

In addition to the direct attacks by Stumpf and Schumann, Münsterberg's general criticism of Wundtian psychology informed many contributions to the new *Zeitschrift*, especially in the reviews of current literature. Münsterberg himself contributed an article concerned with Ebbinghaus's experiments on memory,⁷⁰ but Schumann's review of the second installment of Münsterberg's *Beiträge zur experimentellen Psychologie* praised its effort to combat Wundt's theory of apperception (as indeed his own article sought to do). Schumann summarized Münsterberg's findings with this observation: everything that Wundt ascribed to *activity* of consciousness actually resulted from *changes* in *contents* of consciousness, which changes could be understood through psychophysics [auf psychophysisch verständliche Veränderungen des Bewusstseinsinhaltes zurückzuführen sei].⁷¹ Of course, Münsterberg and Schumann

⁶⁶ This distinction is noticed by D.J. Murray, "Research on human memory in the nineteenth century," *Canadian journal of psychology*, 30 (1976), 201-220; 212-213.

⁶⁷ Friedrich Schumann, "Ueber das Gedächtnis für Komplexe regelmässig aufeinander folgender, gleicher Schalleindrücke," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 75-80.

⁶⁸ They went back and forth a bit on the details: Wundt, "Ueber die Methoden der Messung des Bewusstseinsumfanges," *Philosophische Studien*, 6 (1891), 250-260; Friedrich Schumann, [review of same], *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 115-119.

⁶⁹ Wundt, "Zur Frage des Bewusstseinsumfanges," *Philosophische Studien*, 7 (1892), 222-231; 228.

⁷⁰ Hugo Münsterberg, "Die Association successiver Vorstellungen," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 99-107.

⁷¹ Friedrich Schumann, [review of Münsterberg], *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 129-133; 129. To be sure, Götz Martius reviewed Münsterberg's third installment, and the evaluation was not so favorable: Götz Martius, [review of Münsterberg], *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 199-207.

both championed the physiological interpretation of psychophysics. Münsterberg's review of an essay on will by the Herbartian O. Flügel also criticized Külpe's recent defense of Wundt's "Apperception-metaphysik," as it rejected Herbart's "Realienmetaphysik."⁷² Overall, Münsterberg and Schumann, clever young experimentalists, preferred to address discrete phenomena and to poke holes in Wundt's general apperception theory.

Stumpf's closing lines in his polemic with Wundt mentioned Münsterberg's defection--that "one of the most talented young psychophysicists from the Wundt school" [eines der begabtesten jüngeren Psychophysiker aus Wundt's Schule] had put aside his partially finished research on tone distances and would revise it incorporating Stumpf's recent work.⁷³ Wundt likewise ended his part of the debate with a reference to Münsterberg. If there were such a thing as a "Wundt school," he maintained, then it should only include those who "worked in my laboratory successfully enough to publish the research they carried out there" [die in meinem Laboratorium mit solcher Erfolg gearbeitet haben, dass sie zur Veröffentlichungen hier ausgeführter Untersuchungen gelangt sind]. Wundt wanted to make it clear that attendance of his lectures or even participation in his institute did not necessarily make someone his disciple.

I must guard that such people, who not infrequently have no scientific connection with me whatsoever, are not immediately assumed to be members of my 'school.' I do not feel the least bit responsible for the manner in which they work, and I do not wish that an assumption of even remotest influence should raise any question of their independence.

[Ich muss mich aber dagegen verwahren, dass bei solchen nicht selten mir wissenschaftlich völlig ferne stehenden Personen ohne weiteres eine Zuhörigkeit zu meiner 'Schule' angenommen werde. Ich fühle mich nicht in allergeringste für die Art, wie sie arbeiten, verantwortlich, und ich wünsche nicht durch die Annahme eines wenn auch noch so entfernten Einflusses ihre Selbständigkeit in Frage zu stellen.]⁷⁴

This experience with Münsterberg, added to that with his own teacher du Bois-Reymond, made Wundt reluctant to think of himself as the head of a school of thought. From this point on, he frequently denied the existence of a Wundtian school of psychology.

⁷² Hugo Münsterberg, [review of Flügel], *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 360-362.

⁷³ Carl Stumpf, "Mein Schlusswort gegen Wundt," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 438-443; 443.

⁷⁴ Wundt, "Auch ein Schlusswort," *Philosophische Studien*, 7 (1892), 634-635; 635.

Götz Martius published a critique of Münsterberg's experimental studies,⁷⁵ and he also tried his hand at some of Stumpf's acoustical experiments. They had a relatively civilized exchange on the effects of sound intensity on reaction time.⁷⁶ Martius agreed with Stumpf that there were small differences due to intensity, but he explained them in terms of "physiological effects," and claimed that changes in intensity had negligible effects on the "psychological part of the reaction." To distinguish the physiological from the psychological parts, Martius used the distinction between sensorial and muscular reactions. Significantly, Stumpf let the matter drop.

As the Wundtian held firmly to the terminology of apperception and the sensorial and muscular reaction types, writers in the *Zeitschrift* took little interest at all in reaction-time experiments, the work that bound together the diverse research in the Leipzig Institute. *Zeitschrift* writers concerned themselves instead with fine points of physiology and psychophysics on the one hand, and higher psychic functions like memory on the other. Wundt's unitary conception of experimental psychology, based on his theory of apperception and including only what that theory could comfortably accommodate, did not appeal to them. They would not be bound by his restrictions on experimentation or by his "metaphysical" terminology.

Subsequent volumes of the *Zeitschrift* continued challenging Wundt, and he gradually answered fewer of them. The best he could do was to refuse to take responsibility for all who now worked in the field of research that he had pioneered and institutionalized.

Wundt's increasing isolationism even affected the format of his most important text, the *Grundzüge*. Titchener noticed a change: "throughout the first four editions [1873/74, 1880, 1887, 1893] Wundt tried to keep it encyclopaedic, to make it a handbook of experimental psychology at large.... In the fifth and sixth editions [1902/03, 1908-11] he gave up that attempt, and frankly set forth his own psychological system."⁷⁷ Solomon Diamond has compared opening passages of the different editions of

⁷⁵ Götz Martius, "Ueber die muskuläre Reaction und die Aufmerksamkeit," *Philosophische Studien*, 6 (1891), 167-216.

⁷⁶ Götz Martius, "Ueber die Reactionszeit und Perceptionsdauer der Klänge," *Philosophische Studien*, 6 (1891), 394-416; Carl Stumpf, [review of Martius], *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 2 (1891), 230-232; Götz Martius, "Ueber den Einfluss der Intensität der Reize auf die Reactionszeit der Klänge," *Philosophische Studien*, 7 (1892), 469-486.

⁷⁷ Edward B. Titchener, "Wilhelm Wundt," *American journal of psychology*, 32 (1921), 161-178.

Grundzüge in which Wundt defined the task of physiological psychology. The greatest discontinuity, he found, came with the fifth edition: Wundt softened the language of "alliance" between physiology and psychology and made it clear that the purpose of physiological psychology was not, "as has been mistakenly asserted, to derive or explain phenomena of the mental from those of the physical life."⁷⁸ In other words, Wundt believed he was not changing his position, but rather correcting misinterpretations of his original statements. Many readers, critics and supporters alike, perceived changes nevertheless. A dialectic of intellectual and institutional forces was molding experimental psychology, and Wundt simply could not control them all.

D. Shifting emphasis in psychology: Professors of philosophy in Berlin.

1. Stumpf's call over Wundt, Müller, Erdmann, and Ebbinghaus.

The decision to bring Stumpf to Berlin reflected prominent philosophers' dissatisfaction both with Wundt and with the young psychologists Wundt criticized. On April 1, 1893, a faculty commission considered candidates for a "psychological" chair in philosophy at Berlin.⁷⁹ Zeller had reached the age of 80 and would retire,⁸⁰ and his replacement was to cover, in addition to history of philosophy, also experimental psychology. The commission included, among others, Zeller, Dilthey, and Helmholtz.

Dilthey began the meeting with the statement that only two candidates had the desired expertise in psychology, together with appropriate breadth in the other areas of philosophy: Stumpf and Wundt. Since Wundt was sixty and no longer did his own experiments (not entirely true, but perhaps fair enough), Dilthey thought that Stumpf, aged forty-five, was the better choice. Next Dilthey briefly considered Ebbinghaus, Theodor Lipps and Alois Riehl. He preferred Riehl for his systematic writings but found him unsuitable because he did not experiment. Zeller then asked Helmholtz his opinion of

⁷⁸ Wundt, *Grundzüge*. 5th ed. (1902/03), translated by Solomon Diamond, "Selected texts from writings of Wilhelm Wundt," in *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum, 1980), 155-177; 171.

⁷⁹ The following account is based on Lothar Sprung and Helga Sprung, "Ebbinghaus an der Berliner Universität—ein akademisches Schicksal eines zu früh Geborenen?" in *Internationaler Ebbinghaus-Symposium, Passau, 1985*, ed. Werner Traxel (Passau: Passavia Verlag, 1986), in press.

⁸⁰ Ash errs in stating that the vacancy resulted from Zeller's death; he lived until 1908: Mitchell Ash, "Academic politics in the history of science: Experimental psychology in Germany, 1879-1894," *Central European history*, 13 (1980), 255-286; 271.

Stumpf's *Tonpsychologie*. Helmholtz admitted that he had only studied parts of it, but he commended its polemic against Wundt. Zeller chimed in with criticism of Wundt's "scientific style and method" [wissenschaftliche Art und Methode]. Helmholtz declared his opposition to philosophers who give natural-scientific lectures and try to master fields that can really be researched only by natural scientists. For the professorship under consideration, Helmholtz emphasized competence in philosophy and strict adherence to distinctions between different fields of knowledge. As Helmholtz made comments aimed against Wundt, Dilthey seemed more worried about younger psychologists like Ebbinghaus.

In the commission's report, Dilthey listed the candidates in order of preference--Stumpf, G.E. Müller, and Benno Erdmann. The second and third choices were both already professors at Prussian universities. Ordinarily, they would have had the advantage with Secretary Althoff, who had the final decision on appointments. Müller, though more distinguished, was at least as specialized as Ebbinghaus; since he was listed before Erdmann, the clear preference was for an accomplished experimentalist. Erdmann had been in charge of small psychological laboratories in Breslau and Halle, but his significant experimental work with Dodge came a few years later.

Dilthey's report explained the need for someone who was both philosopher and experimental psychologist, who would make Berlin a center for the popular new field, without opening the door to the wrong kind of psychological research. The strong wish was for Stumpf, as much to ward off evil as to bring good:

He alone among present-day philosophers ranks, in terms of original talent in psychology, with the great psychologists of the recent past, with Fechner and Lotze here, and with Bain and James abroad. Inasmuch as he manages to experiment very soundly and at the same time to formulate truly psychological questions, he is the right man to represent psychological studies in the way appropriate to a university with the importance of ours, as well as to create here an influential center for experimental work by students and young scholars. We are of course grateful to Herr Ebbinghaus for having laid the foundations for this work. Due to his tendencies, Stumpf in particular will know to avoid the danger associated with these young experimental institutes. He will distance himself from attempts to extend into the realm of physiology. He will avoid the abuse, which he has battled so energetically, of wasting students' time with unproductive series of experiments.

[Er allein unter den jetzigen Philosophen reiht in der ursprünglichen psychologischen Beziehungen heran an die grossen Psychologen der letzter Zeit, bei uns an Fechner und Lotze, im Auslande an Bain und James. Indem er nun zugleich von echten psychologischen Fragestellungen aus das Experiment mit voller Solidität handhabt, ist er der richtige Mann, hier das psychologische Studium in einer der Bedeutung unserer Universität entsprechende Weise zu vertreten, sowie auf ihr für experimentelle Arbeiten von Studierenden und

jüngeren Gelehrten einen einflussreichen Mittelpunkt zu schaffen, wofür ja durch Herrn Ebbinghaus schon eine dankenswerthe Grundlage gelegt ist. Nach seiner Richtung wird gerade er die Gefahr, welche mit diesen jungen experimentellen Instituten verbunden sind, zu vermeiden wissen. Er wird sich vom Uebergreifen in das physiologische Gebiet fern halten. Er wird den Missbrauch vermeiden, den er so energisch bekämpft hat, die Zeit der Studierenden in unergiebigem Versuchsreihen zu vergeuden.]⁸¹

Dilthey convinced Althoff to be generous enough to win Stumpf, even to offer 30,500 marks in initial outlay and 5090 annually for a new institute. Stumpf, however, flatly refused to organize a large institute at this time: "I am in any case of the opinion that large-scale research in experimental psychology has objective difficulties... for my part I could not decide, now or later, to follow the example of Wundt and the Americans in this direction."⁸² When negotiations concluded, Stumpf accepted, and Althoff saved money. Berlin's Seminar for Experimental Psychology ("Seminar" and not "Institute") started with an outlay of only 6000 marks and an annual budget of 1000 marks plus an assistant's salary.

Experimental psychology in Berlin did not remain such a modest enterprise for very long. By the time the "Psychological Seminar" was renamed "Psychological Institute" in 1900, it occupied ten rooms and had an annual budget of 2400 marks. The growth would continue. Much of the expansion, especially of experimental work, was due to the efforts of Friedrich Schumann, Stumpf's assistant from 1894 to 1905.⁸³ Together these two helped make Berlin a center of powerful opposition to Wundt, both from the philosophical and the technical side.

Stumpf's call to Berlin must have made Ebbinghaus feel slighted, if not robbed, since he had started the work in experimental psychology in Berlin. Wundt had also been passed over, and G.E. Müller lost out twice. For his position in Munich, Stumpf recommended Theodor Lipps over Müller: "he is too much the one-sided psychologist and cannot guarantee coverage of the history of philosophy."⁸⁴ Lipps's chair in Breslau went to Ebbinghaus, who finally became an Ordinarius at age forty-three--incidentally the same age as Wundt when he arrived in Leipzig.

⁸¹ Dilthey, Berufungsvorschläge, 13 July 1893, quoted in Sprung and Sprung, *op. cit.*

⁸² Carl Stumpf to Friedrich Althoff, 20 October 1893, translated in Mitchell Ash, *op. cit.*, 271-272.

⁸³ Carl Stumpf, "Das psychologische Institut," in *Geschichte der Königlichen Friedrich-Wilhelms-Universität zu Berlin. 3. Band: Wissenschaftliche Anstalten. Spruchkollegium Statistik*, ed. Max Lenz (Halle: Waisenhaus, 1910), 202-207.

⁸⁴ Translated in Ash, *op. cit.*, 275.

The relationship between Dilthey and Ebbinghaus had soured since the two took philosophical walks together ten years earlier. For reasons that are still unclear, but are likely personal as well as ideological, Dilthey withdrew his support, and Ebbinghaus became bitter towards him. Ebbinghaus's publications since the opening of his Berlin laboratory give an idea of what Dilthey called a "waste of time." The three short articles and one somewhat longer study in the first volume of the *Zeitschrift* took the form of research reports in natural science rather than essays in philosophy.⁸⁵ Having made his mark in psychology with an original study of memory, Ebbinghaus meant to establish himself in technical psychophysics. Like G.E. Müller, he favored the physiological interpretation of Fechner's Psychophysical Law over Wundt's Law of Relativity.⁸⁶ The philosophy professors in Berlin were not impressed by his technical work. Zeller had criticized G.E. Müller's physiological interpretation already in 1881, when he also expressed doubts about Wundt's program for psychic measurement.⁸⁷ When Dilthey forsook him, Ebbinghaus had no other influential supporters in Berlin.

Wundt was quite supportive of Ebbinghaus, particularly before the *Zeitschrift* began to appear. In 1887 Ebbinghaus sent his first psychophysical article to Wundt, who returned some encouraging words:

Many thanks for sending me your article, which I read with great interest. I will pass it along right away to some gentlemen in my laboratory who currently work on contrast experiments. It pleases me very much that you have been successful, by the assignment of space [eines Lokals], in getting the first official support for your efforts. In the beginning the important thing is simply to make a start; the rest will follow from there. I doubt that the administration, once it has shown its benevolent cooperation, will then fail to be of further assistance.

[Besten Dank für Ihre freundliche Zusendung, die ich mit grossem Interesse gelesen habe, und die ich sofort einigen Herren meines Laboratoriums, die sich gerade mit Contrastversuchen beschäftigen, zu sorgfältigen Berücksichtigung übergeben werde. Es freut mich aufrichtig, dass es Ihnen gelungen ist, durch die Überweisung eines Lokals eine erste offizielle Förderung Ihrer Bestrebungen zu erhalten. Zunächst kommt es ja nur darauf an, dass ein Anfang gemacht werde; das weitere findet sich denn von selbst, und zweifle ich nicht, dass die Regierung, nachdem sie einmal ihr wohlwollendes Entgegenkommen gezeigt hat, es an weiterer Hülfe nicht wird fehlen lassen.]⁸⁸

⁸⁵ "Die Gesetzmässigkeit des Helligkeitscontrastes," *Sitzungsberichte der königlich-preussischen Akademie der Wissenschaften zu Berlin* (1887), 995-1009; "Ueber den Grund der Abweichungen von dem Weberschen Gesetz bei Lichtempfindungen," *Pflügers Archiv für die gesamte Physiologie*, 45 (1889), 113-133; "Über Nachbilder beim binocularen Sehen und die binocularen Farbeperscheinungen überhaupt," *Pflügers Archiv für die gesamte Physiologie*, 46 (1890), 498-508; "Über negative Empfindungswerte," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 1 (1890), 320-334, 463-485.

⁸⁶ Hermann Ebbinghaus, *Grundzüge der Psychologie*, vol. 1 (Leipzig: Veit, 1902), 514-520.

⁸⁷ Eduard Zeller, "Über die Messung psychischer Vorgänge," *Abhandlungen der königlichen Akademie der Wissenschaften zu Berlin*, 1881.

⁸⁸ Wundt to Hermann Ebbinghaus, 17 December 1887, Universität Passau, Institut für die Geschichte der Neuren Psychologie, Ebbinghaus Archiv.

Wundt's happy prediction for Ebbinghaus in Berlin missed the mark.

The move to Breslau, however, was not all bad for Ebbinghaus. At that large university in the Prussian hinterland, he continued to edit the *Zeitschrift*, to do research in psychophysics, and to direct laboratory exercises in experimental psychology. He broke new ground once again in his study of stress and fatigue in schoolchildren there. Instead of using E.H. Weber's tactile sensibility method to test alertness, as was standard then, he devised sentence completion tests, perhaps the first in any psychological study.⁸⁹ As in his work on memory, Ebbinghaus experimented directly on complex mental functions. His laboratory assistant and most important student in Breslau, L. William Stern, became a leader in educational psychology and introduced the IQ (intelligence quotient) in the form used today. In spite of his abilities, Ebbinghaus had few students and paltry research facilities throughout his career. His experiences demonstrated to Wundt that Prussia generally did not support its experimental psychologists.

Ebbinghaus's career shows just how fortunate G.E. Müller was to have early support from his teacher, Lotze, and to have gotten his appointment when he did. Müller became a professor at a very young age, when the Comtean spirit still engendered relatively uncritical interest in experimental psychology, his speciality. Ebbinghaus was essentially a self-taught psychologist, rather than having Lotze for him in 1881, he had Dilthey against him in 1893. Philosophers' interest in psychophysics and experimental psychology in the early 1880s had, partly through familiarity, waned by the mid-1890s.

2. Dilthey's campaign against explanatory psychology, and confusion concerning Wundt's position.

In 1894, the same year Stumpf arrived in Berlin, Wilhelm Dilthey presented one of his most famous essays to the Prussian Academy.⁹⁰ In it he distinguished two ways of studying psychology: he criticized "constructive, or explanatory" psychology for emulating the natural sciences [Naturwissenschaften] and for its materialistic tendencies; he proposed "analytic and descriptive" psychology as the

⁸⁹ Hermann Ebbinghaus, "Über eine neue Methode zur Prüfung geistiger Fähigkeiten und ihre Anwendung bei Schulkindern," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 13 (1897), 401-459.

⁹⁰ The paper was read in February and June of 1894, then submitted in final written form in January 1895. Wilhelm Dilthey, "Ideen über eine beschreibende und zergliedernde Psychologie," *Sitzungsberichte der Akademie der Wissenschaften zu Berlin*, 1894, 1309-1407. Reprinted in Dilthey, *Gesammelte Schriften*, ed. H. Mehl et al, vol. 5 (Leipzig: Teubner, 1924), 139-240. English edition: Dilthey, *Descriptive psychology and historical understanding*, trans. Richard M. Zamer and Kenneth L. Heiges (The Hague: Martius Nijhoff, 1977), 21-120.

proper basis for all the mental sciences [Geisteswissenschaften], with methods distinct from those of natural sciences. The current trend in psychology, which Dilthey deplored, was to construct explanations from fundamental hypotheses, as physics does, without taking into account that such hypotheses are extremely limited and precarious in investigations of mental phenomena. Dilthey wanted psychological research to be more humanistic and organic, and so more useful to historians, sociologists, political economists, and other scholars in the *Geisteswissenschaften*.

Dilthey's views on psychology had already impinged on Ebbinghaus's chances for advancement at Berlin, so it is not surprising that Ebbinghaus took it upon himself to answer Dilthey's criticism. As editor of the *Zeitschrift*, moreover, he had the appropriate forum for an evaluation of Dilthey's proposals for psychology.

Ebbinghaus's scathing article⁹¹ charged that Dilthey simply did not understand the new psychology well enough to realize that physical models (e.g., Herbart's mental mechanics, British atomistic associationism, and the explanations by vulgar materialists) had been replaced by biological approaches. In physics itself, Ebbinghaus maintained, mechanical explanation was no longer thought to be strictly necessary to scientific research. (Mention was made of Ernst Mach in this connection, of whom more soon.) The psychology that Dilthey criticized, Ebbinghaus explained, was psychology that was no longer practiced; and the psychology that Dilthey proposed was simply not scientific psychology. Dilthey relegated his response to a three-page footnote (!) in his next article. Ebbinghaus's discussion of technical aspects of psychology, Dilthey observed, was simply beside the main point, i.e., the need for descriptive psychology.⁹²

In this aborted debate, Dilthey referred to Wundt and William James as his major allies in this campaign against the natural-scientific, if not materialistic, younger psychologists. Dilthey quoted from Wundt's recent writings to show that Wundt himself had abandoned his earlier, physiological approach to psychology.⁹³ So much was made of this transformation of Wundt's views, that Wundt complained to

⁹¹ Hermann Ebbinghaus, "Über erklärende und beschreibende Psychologie," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 9 (1895), 161-205.

⁹² The Academy paper was read in April 1895, and submitted for publication in March 1896. Wilhelm Dilthey, "Beiträge zum Studium der Individualität," *Sitzungsberichte der preussischen Akademie der Wissenschaften*, 1896, 295-335: 297-299.

⁹³ Dilthey, "Ideen," *op. cit.*, 1336-1337.

Dilthey that he had not recognized the "continuity in standpoint" from Wundt's earliest writings to the present [dass ich Übereinstimmung Ihres Standpunktes von Ihren ersten Schriften ab verkannt habe].⁹⁴

Ebbinghaus assumed that Dilthey counted Wundt's work as part of explanatory psychology, particularly in his argument that the "bankruptcy" of explanatory psychology was evident in the split between the partisans of Münsterberg (physiological explanation) and of Wundt (psychic explanation).⁹⁵ In an effort to identify his views with Wundt's, Dilthey suggested that "constructive" was a better adjective than "explanatory" to refer to the psychological method that they both opposed.⁹⁶

Wundt, although in many ways close to Dilthey's point of view, would have no part of descriptive psychology. Dilthey assumed that his support for Stumpf in Berlin had turned Wundt against him.⁹⁷ This may have been a factor, but there was also an important theoretical point at stake. Dilthey rejected causal explanation [Causalerklärung] in psychology and preferred to speak of causal connection [Causalzusammenhang]. Wundt insisted that psychic causality was more than just connections.⁹⁸

As it turned out, Dilthey was to suffer very little from Wundt's opposition; he was on the verge of becoming very popular with younger philosophers. As H. Stuart Hughes observed, Dilthey was so old-fashioned and lived so long that he was modern by the end of his life.⁹⁹ Wundt, on the other hand, was a leading "modern" philosopher in his middle age; then by the time he was old, his psychological ideas were either misunderstood or, if properly understood, considered outmoded.

⁹⁴ Wilhelm Dilthey to Wundt, 20 March 1896, UAL, Wundt Nachlass, Nr. 1122.

⁹⁵ Hermann Ebbinghaus, "Über erklärende und beschreibende Psychologie," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 9 (1895), 161-205; 166.

⁹⁶ Dilthey to Wundt, *op. cit.*

⁹⁷ Wilhelm Dilthey to Paul York von Wartenburg, 13 October 1895, in Erich Rothacker, ed., *Briefwechsel zwischen Wilhelm Dilthey und dem Grafen Paul York von Wartenburg 1877-1897* (Halle: Niemeyer, 1923), 188-189.

⁹⁸ Wundt, "Ueber psychische Causalität und das Princip des psycho-physischen Parallelismus," *Philosophische Studien*, 9 (1894), 1-124.

⁹⁹ H. Stuart Hughes, *Consciousness and society: The reorientation of European thought, 1890-1930*, 2nd ed. (NY: Vintage Books, 1977), 192.

E. Defection from the ranks: Külpe.

Because of the lack of institutional support, the younger psychologists in Prussia, concentrating on psychophysics and special areas like memory, were in no position to challenge Wundt's large research program for psychology. Those with physiological inclinations had difficulties, as professors of philosophy, getting funding and facilities for their experimental work. This situation reinforced Wundt's preeminence in experimental psychology for a while longer. Nevertheless, strong trends in philosophy were taking directions that Wundt opposed.

Wundt's opponents were no longer limited to narrow psychophysicists and old-style speculative psychologists, once Stumpf came to Berlin. Stumpf commanded respect as an experimentalist (although apparently not Wundt's), and he stayed abreast of movements in general philosophy. His function in Berlin was similar to that of his teacher Brentano in Vienna--Stumpf was the father figure for productive intellectual movements that took several directions.

Even before Stumpf moved to Berlin, Wundt's edifice began to weaken from within. In the Leipzig Institute, young psychologists who were uncertain about Wundt's theories were able to find refuge in a new philosophical outlook. This new way of thinking did not require them to forsake Wundt's psychological theory for another, but rather to treat all theories with extreme, critical distance. The philosophical doctrine that encouraged this view of science was generally called positivism, critical realism, or most specifically, empiriocriticism.

1. The new positivism of Avenarius and Mach.

Empiriocriticism's major proponents were Richard Avenarius and Ernst Mach, who worked in Switzerland and Austria, respectively, and whose writings eventually affected most German-speaking scholars and scientists, and even some abroad. The growing influence of their theory of science at the end of the nineteenth century corresponded to the decline of the older positivism, which this dissertation has referred to as the Comtean spirit.

Although Mach became the more famous figure, Avenarius was more familiar to the experimental psychologists associated with Wundt. He has appeared in Chapters Three and Five as Wundt's younger

colleague in Leipzig and founder of the Academic-philosophical Club there, as Wundt's successor (once removed) in Zürich, and as editor of the *Vierteljahrsschrift für wissenschaftliche Philosophie*. In 1883 Avenarius still identified himself with "philosophy of the Wundtian direction."¹⁰⁰ In the late 1890s, however, Ernst Meumann had Wundt's blessing for a campaign to run Avenarius's disciples out of Zürich University. The relationship between Wundt and Avenarius deserves closer analysis.

In the 1870s, Wundt's scientific approach to psychology encouraged Avenarius in his ambition to construct an epistemology without metaphysical assumptions.¹⁰¹ His effort resulted in the massive *Kritik der reinen Erfahrung*,¹⁰² and its extremely complex description of "System C," the single site of the pure sensations, which are the ultimate data of knowledge.¹⁰³ Although System C is sometimes reminiscent of the central nervous system, Avenarius was not interested, as Wundt was, in describing the anatomy and physiology of the nervous system. According to Avenarius, metaphysical systems of materialism and idealism had unnecessarily separated physical and psychic phenomena, though all these phenomena are really actions within the same System C. Avenarius suggested that this radical separation had come about because some changes in System C are independent (these correspond to physical changes), whereas others (commonly called psychic events) are dependent on those independent changes. Avenarius thus leaves room for a distinction between the physical (or physiological) and the psychic; his main point, though, is to show their common seat in his System C.¹⁰⁴

Whereas Avenarius was plodding, systematic and very heavy on details, Mach promoted virtually the same view in clear, critical, often iconoclastic style. When Mach was professor of physics at Graz and then at Prague, Fechner's psychophysics had inspired him to investigate complex questions involving physiology, sensation, perception, psychology, and epistemology.¹⁰⁵ In 1895, he and Friedrich Jodl

¹⁰⁰ Richard Avenarius to Wundt, 22 February 1883, UAL, Wundt Nachlass, Nr. 1023.

¹⁰¹ His habilitation in Leipzig: Richard Avenarius, *Philosophie als Denken der Welt, gemäss dem Princip des kleinsten Kraftmasses: Prolegomena zu einer Kritik der reinen Erfahrung* (Leipzig: O.R. Reisland, 1876).

¹⁰² Richard Avenarius, *Kritik der reinen Erfahrung* 2 vols. (Leipzig: O.R. Reisland, 1888, 1890).

¹⁰³ For a summary of this system in English: Friedrich Carstanjen, "Richard Avenarius and his general theory of knowledge, empiriocriticism," *Mind*, NS, 6 (1897), 449-475.

¹⁰⁴ This distinction was a central issue in his publications following the *Kritik*: Richard Avenarius, *Der menschliche Weltbegriff* (Leipzig: O.R. Reisland, 1891); "Bemerkungen zum Begriff des Gegenstandes der Psychologie," *Vierteljahrsschrift für wissenschaftliche Philosophie*, 18 (1894), 137-161; 400-420; 19 (1895), 1-18; 129-145. These are published together in the third edition of *Der menschliche Weltbegriff* (1912).

¹⁰⁵ The major psychophysical work: Ernst Mach, *Beiträge zur Analyse der Empfindungen und das Verhältnis des Physischen zum Psychischen* (Jena: Fischer, 1886).

(author of a respected history of ethics) became professors of philosophy at Vienna, after Brentano withdrew to private life in Italy. As in Leipzig when Wundt came, a single chair was divided into two, in order to represent natural-scientific and nonscientific concerns of philosophy. This was twenty years later, however, and Mach had a philosophy of science that was very different from Wundt's.

By the time he went to Vienna, Mach was aware that Avenarius's point of view was close to his own. (After Avenarius died in 1896, Mach acknowledged this intellectual affinity by becoming a collaborating editor for the *Vierteljahrsschrift*.) One leader of the Vienna Circle of logical positivism in the 1920s, a group of philosophers greatly influenced by Mach, offered this description of their inspirational figure:

Mach was a physicist, physiologist, and also psychologist, and his philosophy... arose from the wish to find a principal point of view to which he could hew in any research, one which he would not have to change when going from the field of physics to that of physiology or psychology. Such a firm point of view he reached by going back to that which is given before all scientific research: namely, the world of sensations... Scientific knowledge of the world consists, according to Mach, in nothing else than the simplest possible description of the connections between the elements [i.e., the sensations], and it has as its only aim the intellectual mastery of those facts by means of the least possible effort of thought. This aim is reached by means of a more and more complete 'accommodation of the thoughts to one another.' This is the formulation by Mach of his famous 'principle of the economy of thought.'¹⁰⁶

Whereas Avenarius laboriously developed the relationships of these neutral sensations to the many problems of philosophy, Mach launched frontal attacks on fundamental concepts of classical physics. According to him, the law of conservation of energy, Newton's laws of mechanics, atoms, fields, etc., are all simply economical representations of certain correlations of sensations. The only reality is sensation, and the essential thing is that the human organism interprets its environment in an economical way, in order to control it, use it and avoid harm. Mach thus appealed to the biological needs of the human being as the ultimate justification for his theory of science. Ebbinghaus echoed Mach, in his essay against Dilthey, when he stated that not only psychologists, but also physicists, relied on a biological model of scientific knowledge. This critical positivism thus differed from the more optimistic Comtean positivism, which looked to the field of physics for the model of scientific knowledge and applied this

¹⁰⁶ Moritz Schlick (1926), translated in Gerald Holton, "Mach, Einstein, and the search for reality," in *Thematic origins of scientific thought. Kepler to Einstein* (Cambridge, MA: Harvard U. Press, 1973), 219-259; 222.

model to other fields. Apparently Ebbinghaus was unaware that many working physicists disagreed with Mach and were quite content to be Kantians or even naive realists--if they cared about epistemological questions at all.¹⁰⁷

Wundt had no immediate response to Avenarius's *Kritik* when it appeared in 1888 and 1890, but he published his *System der Philosophie* at about the same time (1889), and the difference in their viewpoints was apparent. In 1891 Wundt quietly withdrew as coeditor of the *Vierteljahrsschrift*, perhaps convinced by the first issues of Ebbinghaus's *Zeitschrift* that he should close ranks. The first evidence of the influence of Mach and Avenarius on experimental psychologists surfaced vaguely in Münsterberg's sensationalistic theories, published in 1888 and 1889. A confrontation between Wundt and Oswald Külpe in 1895-96 showed that the new positivism was also affecting those who were otherwise very faithful to Wundt's program. Only after he wrote against Külpe, and not before Avenarius died, did Wundt directly criticize empiriocriticism, generally for being "scholastic" and discursive, rather than hypothetical-empirical.¹⁰⁸

Although his early writings supported Wundt's theory of central volition against Münsterberg's sensationalism, Külpe's thinking gradually drifted toward the views of Avenarius and Mach. Boring recounts conversations between Külpe and E.B. Titchener, his friend and his student from 1890 to 1892. Since Titchener was Boring's teacher, this hearsay is fairly credible. The two young psychologists working together in Leipzig were dissatisfied with Wundt's strict distinction between psychology as the study of immediate experience on the one hand, and physics and physiology as studies of mediate experience on the other. They decided for the new epistemology of Mach and Avenarius.

Having got clear on point of view, Külpe published his *Grundriss der Psychologie* in 1893, dedicating it to Wundt. He defined psychology as the science of the 'facts of experience,' and he further pointed out that it is characterized by 'the dependency of facts on experiencing individuals.' This is the idea that he got from Avenarius, and it had for him the advantage of allowing physics to deal with experience taken as independent of the experiencing individual. Mediate experience, which Wundt assigned to physics, seems, being mediate, not to be experience at all. The new formula was better.¹⁰⁹

¹⁰⁷ For example, Max Planck's criticism of Mach: J.L. Heilbron, *The dilemmas of an upright man: Max Planck as spokesman for German science* (Berkeley: U. of California Press, 1986), 47-60.

¹⁰⁸ Wundt, "Über naiven und kritischen Realismus," *Philosophische Studien*, 13 (1898), 1-105, 323-433.

¹⁰⁹ Boring, 400.

Külpe's textbook basically presented Wundtian experimental psychology, but it also argued in favor of the philosophical standpoint of empiriocriticism.¹¹⁰ Moreover, as he covered alternative views of the Psychophysical Law, Külpe gave the physiological interpretation by G.E. Müller (his first teacher) equal weight with the purely psychological interpretation of Wundt.¹¹¹

2. Wundt and Külpe disagree on psychology's place in philosophy.

Külpe's psychology textbook of 1893 planted seeds of disagreement with Wundt, but the problem really erupted after Külpe left Leipzig and wrote his second book. During his first year at Würzburg, Külpe sent Wundt his *Einleitung in die Philosophie*.

May you find that it is a useful little book and that the philosophical spirit which stirs in it has developed a legitimate side-branch of your tree. You will, of course, come across yourself everywhere--it would not be possible otherwise--and you will hopefully not find yourself to be misunderstood where the author confronts your views. Orientation on philosophical works, past and present, was my main purpose; original contributions and criticism or polemics were only secondary. Therefore the latter aspect will seem insufficiently developed at many points. But if the critical comments provide effective stimulation, then my purpose will have been achieved.

[Möchten Sie finden, dass es ein nützliches Büchlein ist und der philosophische Geist, der sich darin regt, als ein berechtigtes Seitenzweiglein von Ihrem Stamme sich entwickelt hat. Sie werden überall--wie es ja nicht anders möglich ist--auf sich darin stossen und sich hoffentlich auch nicht verkannt finden, wo der Verf. Ihnen entgegentritt. Orientierung über die philosophische Arbeit von Einst und Jetzt war mir die Hauptsache, Selbständiges und Kritik oder Polemik nur sekundär. Darum wird Ihnen mancher Punkt in der letzteren nicht genügend ausgeführt erscheinen, wenn er jedoch anregend zu wirken vermag, wäre mein Zweck erreicht.]¹¹²

From the end of June to mid-September, Külpe had no reaction from his teacher. Then Wundt vacationed in the Thuringian Forest and, as was his custom, used his "leisure" to catch up on reading and correspondence.

Wundt came down hard on Külpe. It was not the first time they were aware of differences in their views, and Wundt had apparently been contemplating a response to Külpe's *Grundriss*. The *Einleitung*, however, gave Wundt more urgency to set his student straight:

¹¹⁰ Külpe himself described it that way: Oswald Külpe, *Introduction to philosophy, a handbook for students of psychology, logic, ethics, aesthetics and general philosophy*, trans. W.B. Pillsbury and E.B. Titchener (London: Swan Sonnenschein, 1901), 59. German original, 1895.

¹¹¹ Oswald Külpe, *Outlines of psychology based upon the results of experimental investigation*, trans. E.B. Titchener (London: Swan Sonnenschein, 1895), 163-168. German original, 1893.

¹¹² Külpe to Wundt, 30 June 1895, UAL, Wundt Nachlass, Nr. 386.

First of all, I find your book to be terse, purposeful, articulate, and precise in its expression. Therefore I do not doubt that to many, particularly to those who are sympathetic to your viewpoint, it will be a welcome introduction to philosophy.

As for myself, you of course know that I do not belong to that group. And I can certainly say that the divergence of our views, as I see it, is in fact considerably greater than I assumed from your *Grundriss*. I would not regret that in and of itself, and would even welcome it under certain circumstances. But there is one thing that I really and truly regret. That is this: I consider the way of 'psychophysical materialism' which you have trod--and you already know this--to be not only fruitless for psychology, but even damaging....

I regret even more that in your critique of the *Aktualitätstheorie* and *Voluntarismus*, you impute to their representatives views which they, or at least I do not hold, and at times even some which are in direct opposition to my actually expressed views. You will of course understand that I now find it necessary to correct you on this matter, since you are held to be one of the 'initiated' of the alleged 'Leipzig school'--which in fact, at least in terms of general psychological direction, does not exist at all. This will occur in an essay on the definition of psychology which I have written here.

[Zunächst finde ich Ihr Buch knapp, zweckmässig, gegliedert, in der Darstellungsform präcis, und ich zweifle daher nicht, dass es Vielen, namentlich Solchen, denen der von Ihnen eingenommenen Standpunkt sympathisch ist, eine willkommene Einführung in die Philosophie sein wird.

Was nun mich betrifft, so wissen Sie ja natürlich, dass ich zu diesen letzteren nicht gehöre. Auch kann ich wohl sagen, dass die Divergenz unserer Ansichten, wie ich sehe, doch erheblich grösser ist, als ich nach Ihrem 'Grundriss' angenommen hatte. Das würde ich an und für sich nicht bedauern, ja unter Umständen als erfreulich begrüßen. Dagegen ist es eines, was ich wirklich und aufrichtig bedaure. Das ist dies, dass ich den Weg des 'psychophysischen Materialismus,' den Sie beschritten haben--wie Sie das ja bereits wissen--nicht bloss einen für die Psychologie fruchtlosen, sondern für einen schädlichen...halte....

Was ich übrigens noch mehr bedaure als dies ist, dass Sie in Ihrer Kritik der Aktualitätstheorie und des Voluntarismus den Vertretern derselben Ansichten unterschieben, die dieselben, oder die wenigstens *ich* nicht habe, ja gelegentlich solche, die sich in directem Gegensatz zu meiner wirklich ausgesprochenen Anschauung befinden. Sie werden es gewiss begreifen, wenn ich es für nöthig halte, Sie in dieser Beziehung zu rektifizieren, da Sie ja für einen 'Eingeweihten' der angeblichen, in Wirklichkeit aber--wenigstens hinsichtlich der *allgemeinen* psychologischen Richtung gar nicht existierenden 'Leipziger Schule' gehalten werden. Es wird das in einem Aufsatz über die Definition der Psychologie geschehen, den ich hier verfasst habe.]¹¹³

Wundt's letter shocked and bewildered Külpe, who answered the very next day. (Postal service was very efficient in those days.) Külpe could not see that he had misrepresented Wundt's views, and he did not think "psychophysical materialism" was an appropriate description of his own views: the *Einführung* distinguished between psychological "dependency" and "causality," specifically to escape the errors of materialism.¹¹⁴

Wundt answered the following day. He explained that their disagreement had simply become so

¹¹³ Wundt to Külpe, 18 September 1895, UAL, Wundt Nachlass, Nr. 387.

¹¹⁴ Külpe to Wundt, 19 September 1895, UAL, Wundt Nachlass, Nr. 388.

serious as to demand clarification.

I cannot deny that I was not exactly pleasantly surprised when your recent works brought forth psychological and philosophical views fundamentally different from my own. And I also do not want to conceal the fact that, considering the openness with which I always spoke with you about my views, plans, etc., I could not totally suppress this thought: I always believed I could expect an open discussion with you if you had any problems with, or convictions other than my own views. This is particularly a problem since your new convictions in many ways contradict your earlier ones, e.g., in your essay on will. So you cannot reproach me because I was surprised--indeed startled--by your *Psychologie*, just as others were--for example, Götz Martius.¹¹⁵ And you will also have to admit that with the relationship that exists between us, I could not expect to experience such a sudden surprise.

[Ich kann allerdings nicht leugnen, dass, als in Ihren neuesten Schriften, in allen Punkten eine von der meinigen grundsätzlich verschiedene psychologische und philosophische Grundanschauung bei Ihnen hervortrat, ich nicht gerade freudig überrascht war. Ich will auch nicht verhehlen, dass ich in Anbetracht der Offenheit, mit der ich Ihnen gegenüber stets von meinen Ansichten, Plänen u. dgl. gesprochen hatte, den Gedanken nicht ganz unterdrücken konnte: wenn in diesem und jenem Ihnen Bedenken oder andere Überzeugungen kamen, eine offene Besprechung mit mir wohl von meiner Seite erwartet werden konnte, umso mehr da Ihre neue Überzeugungen doch in manchen Punkten Ihren früheren, wie sie z.B. in Ihrer Abhandlung vom Willen ausgesprochen wurden, entgegenliefen. Dass ich also von Ihrer Psychologie überrascht,--ja verblüfft war--gerade so gut wie das Andern, z.B. Götz Martius begegnet ist--werden Sie mir nicht verargen können, und auch das werden Sie mir wohl gestehen, dass ich bei dem zwischen uns bestehenden Verhältnis erwarten konnte eine solche plötzliche Überraschung nicht zu erleben.]¹¹⁶

In Wundt's theory, voluntary action always originates at the focus [Blickpunkt] of apperception. The act of apperception, considered as a psychological process, is not subject to the physical law of conservation of energy, and "creative synthesis" can occur. This model of psychic action informs two key terms in Wundt's philosophical writing: *Voluntarismus* in psychology (as opposed to necessity in the reflex models) and *Aktualitätstheorie* in metaphysics (which posits mind as activity rather than substance). Wundt expounded *Aktualitätstheorie* in contradistinction to *Substantialitätstheorie*, which treated mind as a collection of self-motivated entities, such as Herbart's *Vorstellungen*, Leibniz's monads, or the atoms of materialism.¹¹⁷

Wundt found that Külpe's book misrepresented his views. Will is not an abstract, unified function, preexisting all other psychic contents, and drive [Trieb] is not simple willing devoid of any content

¹¹⁵ Götz Martius reviewed Külpe's psychology textbook in *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 9 (1895), 23-45.

¹¹⁶ Wundt to Külpe, 20 September 1895, UAL, Wundt Nachlass, Nr. 389

¹¹⁷ Wundt, *System der Philosophie* (Leipzig: Engelmann, 1889). For an English review, see Charles H. Judd, "Wundt's system of philosophy," *Philosophical review*, 6 (1897), 370-385. A recent, full-length study: Alfred Arnold, *Wilhelm Wundt, sein philosophisches System* (Berlin, GDR: Akademie Verlag, 1980).

of feeling--those definitions were diametrically opposed to Wundt's. The implication that *Voluntarismus* makes *Willen* into an *Urfunktion*, analogous to *Vorstellen* (representing, ideating) in Herbarian psychology, went against the spirit of *Aktualitätstheorie*, which emphasized that *Vorstellungen* and *Willensvorgänge* (volitional processes) are events, not objects.

Wundt assured Külpe that he was not charging him with deliberate misrepresentation; rather, he indicated that Külpe's work was a bit sloppy and that his philosophical approach had poisoned his understanding.

I want to be frank with you; I do not want to deny that it appears to me that there is sometimes a certain carelessness in your construction or rendering of formal philosophical positions. But the main problem is that you have taken on a way of thinking [Betrachtungsweise] that is diametrically opposed to mine. It is therefore no longer possible for you, for all your good intentions, to imagine yourself with my viewpoint.

[Dass allerdings mir zuweilen bei Ihnen eine gewisse Flüchtigkeit in der Auffassung oder in der Wiedergabe formaler Ansichten mitzuwirken scheint, will ich--da ich Ihnen gegenüber ganz offen sein will-- nicht leugnen. Die Hauptsache aber ist, dass Sie sich eine Betrachtungsweise angeeignet haben, die der meinigen diametral entgegengesetzt ist, und dass es Ihnen daher mit dem besten Willen nicht mehr möglich ist sich auf meinen Standpunkt zu versetzen.]

Wundt insisted that Külpe was indeed a "psychophysical materialist," precisely because he rejected the notion of psychic causality and preferred instead to speak of psychic "linkages" that are dependent upon the causal explanations of physiology.

Psychophysical materialism assigns the *causal explanation* of psychic 'connections' and 'linkages' to physiology. You make a *fundamental* assumption of this standpoint (the same as Münsterberg, who first used the term psychophysical materialism and who also postulates no psychophysical causality, only dependency), even if you perhaps are not so consistent in keeping to this fundamental standpoint in all the details.

[...dass er die *Causalerklärung* der physischen 'Verbindungen' und 'Verknüpfungen' der Physiologie zuweist. Diesen Standpunkt nehmen Sie nun (gerade so wie Münsterberg, der den Namen psycho-phys. M. zuerst gebraucht hat und *auch* keine psycho-physische Causalität, sondern nur Abhängigkeit statuiert) *princiell* ein, wenn Sie auch vielleicht im Einzelnen diesem prinzipiellen Standpunkt nicht immer treu bleiben.¹¹⁸

Külpe's reply was dated two days later. (Perhaps he missed the first post because he wrote such a very long letter.) He expressed relief that Wundt had exonerated him from purposefully misrepresenting

¹¹⁸ Wundt to Külpe, 20 September 1895, UAL, Wundt Nachlass, Nr. 389. Wundt's critique of Münsterberg's "psychophysical materialism" had just appeared in the final section of the second edition of his text on logic: Wundt, *Logik, eine Untersuchung der Principien der Erkenntnis und der Methoden wissenschaftlicher Forschung. 2. Band: Methodenlehre. 2. Teil: Logik der Geisteswissenschaften*, 2nd ed. (Stuttgart: Enke, 1895).

others' views, and he politely thanked Wundt for pointing out his occasional inaccuracies when rendering them. Though he accepted the criticism as stimulus to better work in the future, Külpe did not capitulate to all of Wundt's charges.

Külpe could not conceive that Wundt should have been so surprised by his textbook on psychology, since a previous article for Wundt's journal had the same view of psychology.¹¹⁹ Külpe had even expressed concern about their differences when he presented Wundt with a copy of the book. "And I was pleased and reassured by your splendid answer: the more independent [selbständiger] it is, the more it will please me." [Ich bin durch Ihre herrliche Erwiderung: Je selbständiger es ist, um so mehr wird es mich freuen, ausserordentlich beglückt und beruhigt worden.] Külpe had always assumed that their disagreements were not fundamental, with respect to either philosophy or psychology. That impression was confirmed following Külpe's inaugural lecture as Professor Extraordinarius in 1893, on which occasion Wundt told him, "we differ more in expression than in content" [es wäre mehr der Ausdruck, als die Sache verschieden bei uns]. That lecture, Külpe noted, set out the program for his textbook on philosophy that had just appeared, and which Wundt now found to contain such surprising views. In short, Külpe refused to take all the blame for their lack of communication on philosophical issues.

Külpe continued: he could name more points on which they agreed or disagreed, but he was too skeptical to rely on any "particular metaphysics or even any solid conviction." Külpe thus stood by his critical, antimetaphysical viewpoint, which was inspired by the empiriocriticism of Mach and Avenarius.

As for Wundt's proposed article on the definition of psychology, Külpe thought that it would have no direct bearing on their philosophical disagreement, and he did not want to publish any response.

My only wish was to cleanse myself from heavy suspicion from a man to whom I owe so much and whom I place above all living colleagues. If I have been fairly successful at this, then I am pleased. It would especially please me, if you were to come to see that the difference between our views is not so pervading or gaping as you now seem to assume. At least it is my belief that *in necessariis unitas* is still the rule and that *libertas dubiis* does not yet indicate to me a contradiction of this. My warm, thankful heart beats a joyful response to your closing wishes for the unclouded preservation of our personal relations.

¹¹⁹ Oswald Külpe, "Das Ich und die Aussenwelt," *Philosophische Studien*, 7 (1892), 394-413; 8 (1893), 311-342.

[Mein einziger Wunsch war mich von einem schweren Verdacht einem Manne gegenüber zu reinigen, dem ich so viel verdanke und den ich unter den lebenden Fachgenossen am höchsten stelle. Wenn mir das einigermassen gelungen ist, so bin ich befriedigt. Ganz besonders freuen würde es mich, wenn Sie selbst erkennen sollten, dass die Differenz unserer Anschauungen keine so durchgehende und klaffende ist, wie Sie jetzt anzunehmen scheinen. Ich glaube wenigstens, dass in necessariis unitas herrscht und dass die libertas dubiis bei mir noch nicht einen bestimmten Gegensatz bedeutet. Ihrem zum Schluss ausgesprochenen Wunsche nach ungetrübter Erhaltung der persönlichen Beziehungen aber schlägt mein warmes, dankbares Herz freudig entgegen.]¹²⁰

Wundt's essay "Ueber die Definition der Psychologie" opened with an assessment of the state of the field: "Psychology--and this can no longer be denied today--is on the way to changing from an area of philosophy into an independent, positive science." [...Psychologie, von der wohl heute nicht mehr bestritten werden kann, dass sie auf dem Wege ist, sich aus einem Teilgebiet der Philosophie in eine selbständige positive Wissenschaft umzuwandeln...]¹²¹ This does not mean, Wundt continued, that psychologists are no longer philosophers: on the contrary, their philosophical viewpoint should be mature by this point. Wundt's use of the word "positive" shows that the Comtean spirit, and not Machian positivism, was still operative in his thinking about the goals of scientific psychology.

The central problem of psychology, Wundt explained, is the relationship between subject and object. The problem is found in John Locke's distinction between sensation and reflection and in the German philosophers' (Beneke, Herbart, Fechner) distinction between inner and outer experience. In experimental psychology, this problem had produced two different definitions of psychology.

The "wrong definition" sees psychology as the science which treats psychic phenomena as dependent on the experiencing subject, which is in turn regarded as a corporeal object to be studied by natural science. This psychology has two parts. First, it analyzes consciousness into its elements. That preliminary part is essentially independent of the second part: the investigation of those elements' "dependency" relationships, i.e., the "causal" relationships among their physiological correlates. This second part makes psychology into nothing more than applied physiology [ganz und gar zu einem Anwendungsgebiet der Physiologie]. Wundt cited Münsterberg and Külpe as proponents of this definition of psychology and complimented the latter author for his "more precise exposition."

¹²⁰ Külpe to Wundt, 22 September 1895, UAL, Wundt Nachlass, Nr. 390.

¹²¹ Wundt, "Ueber die Definition der Psychologie," *Philosophische Studien*, 12 (1896), 1-66: 2.

According to Wundt, the “wrong definition” of psychology contains logical fallacies and “contradicts the historical development and real meaning of the natural sciences.” It simply reissues the old metaphysics of substantiality in the guise of “psychophysical materialism.” The only distinction between psychophysical materialism and the older materialism is that *connections* of psychic elements, not the elements themselves, are treated as the crucial substance [nur die *Verbindungen* der psychischen Elemente, nicht aber, wie der eigentliche Materialismus behauptet, die *Elemente selbst*]. These words are essentially the same ones Wundt used in his earlier letter to Külpe. Curiously, Wundt’s essay does not mention the obvious influence of Avenarius on this definition of psychology, although Külpe’s book on philosophy must have made him aware of that influence.

Wundt’s own definition of psychology starts from the premise that experience is unitary, although each experience involves two factors which are inseparably combined: the object and the experiencing subject. Natural science studies objects and depends on *mediate experience*, that is, it employs hypothetical concepts which are abstracted from subjective experience. Psychology studies *immediate experience*, and does not depend on terms that are abstracted from experience in the way concepts of natural science are.

Wundt thus asserted that psychology as a whole is not a natural science, for reasons very close to those given in Dilthey’s essay on psychology, which was published just a few months earlier. Experimental psychology, according to Wundt, *coordinates* natural-scientific studies with psychological ones. Experimental psychologists, however, must keep the distinction clear, or else they will slip back into the old metaphysics of mental attributes (substantiality), as Külpe and the other “psychophysical materialists” had.

Evidently, both Wundt and Külpe assumed that their disagreement had no direct bearing on the actual practice of experimental psychology. Wundt continued to encourage Külpe’s efforts to establish an institute in Würzburg, and the *Philosophische Studien* continued to publish work by Külpe’s students. A decade later Wundt discovered, again to his great surprise, that experimental methodology in Külpe’s lab, and not just philosophy, had strayed from Wundtian standards (see Chapter Eight).

In one important area of psychological research, Külpe had already in the 1890s begun to find problems with Wundt's experiments. Külpe contributed some subtle shifts in the interpretation of reaction-time experiments, and little by little, reaction-time research was displaced from its central role in the experimental and theoretical development of Leipzig psychology.

3. The crisis of the reaction-time experiment, and Wundt's tridimensional theory of feelings.

The reaction-time experiment was arguably the most integral part of the research program in the first decade of the Leipzig Institute, when that institution was the unchallenged leader in the field. These experiments purported to investigate "purely psychological" phenomena, whereas psychophysics and sensory physiology could not. Külpe, however, came to the conclusion that the subtraction method, as used in Leipzig, could not analyze complex reactions. Authors writing for the new *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, moreover, devoted almost no attention at all to reaction-time work. Reaction-time experiments may have failed to provide a direct means of analyzing mental processes, but as it turned out, they provided a good means for clarifying points of view in experimental psychology.

Chapter Four discussed how work by Cattell and others in the Leipzig Institute reduced measured reaction times to such an extent as to cast doubt on Wundt's five-stage model: sensation, perception, apperception, volition, reactive impulse. Ludwig Lange then came to the model's rescue by distinguishing two different types of reactions, muscular and sensorial. In the shorter muscular reaction the subject attended to the reactive movement; in the longer sensorial reaction, attention focused on the stimulus. According to Wundt's theory, the muscular reaction was only possible in simple reactions; it was essentially a reflex which short-circuited the psychic stages in his model. A sensorial reaction might be either simple or compound, i.e., involving one or several psychic actions such as discrimination, choice, or association. For a while longer, the Institute still used the sensorial reaction and the subtraction method to analyze complex reactions.

With the acceptance of the sensorial-muscular distinction, the role of attention became very important, since attention either to the stimulus or to the response movement distinguished the two types. Consequently, Leipzig researchers began investigating and timing fluctuations [Schwankungen]

of attention.¹²² Külpe, seeking an elegant approach to the problem, noticed certain constant departures from simultaneity when subjects attempted to react with both hands at once. He tried to discover how different types of expectation or attention produced preferences of one hand over the other, and how these preferences changed with changes in preparation. By determining variable factors of preparation, Külpe hoped to understand their role in these reactions, especially in the more variable sensorial type.

But Külpe was unable to bring his research to the hoped-for conclusions. He was able to show that variation of attention was the most significant factor--more important than intensity and clarity of the stimulus, or than the external conditions for the reacting movement. However, he did not get very far in his study of preparation and its effects on attention.¹²³ Instead, Külpe prepared for publication, in 1893, his *Grundriss der Psychologie*, which included a critique of reaction-time experiments, and particularly of the subtraction method.

The time required for a distinct mental action in a compound reaction, Külpe argued, could not be derived by simple subtraction. The problem was that addition of a mental task (e.g., discrimination, choice) inevitably required different mental preparation. Time of a compound reaction minus time for a corresponding simple reaction did not equal time for the added mental act, because preparation for the compound reaction differed from that for the simple reaction. Külpe's psychology textbook treated reaction-time experiments with a tone of apology, and did not even mention his own aborted work on preparation and attention.¹²⁴

In the meantime, Münsterberg had suggested disposing of the sensorial reaction and its alleged psychic actions altogether. He claimed that the muscular reaction was just as useful for studying compound reactions as for simple ones. Münsterberg's reaction-time work and its theoretical implications were favorably received by William James in America, as well as by many of Wundt's opponents in

¹²² Three such studies came out in the same volume of Wundt's journal: Hugo Eckener, "Untersuchungen über die Schwankungen der Auffassung minimaler Sinnesreize," *Philosophische Studien*, 8 (1893), 343-387; Edward A. Pace, "Zur Frage der Schwankungen der Aufmerksamkeit nach Versuchen mit der Masson'schen Scheibe," *ibid.*, 388-402; Karl Marbe, "Die Schwankungen der Gesichtsempfindungen," *ibid.*, 615-637.

¹²³ Oswald Külpe, "Ueber die Gleichzeitigkeit und Ungleichzeitigkeit von Bewegungen," *Philosophische Studien*, 6 (1891), 514-535; 7 (1892), 147-168. Külpe promised a third part, and it was still anticipated by E.B. Titchener, "The Leipzig School of experimental psychology," *Mind*, NS 1 (1892), 206-234; 219-221. That third part never appeared.

¹²⁴ Oswald Külpe, *Outlines of psychology based upon the results of experimental investigation*, trans. E.B. Titchener (London: Swan Sonnenschein, 1895), 406-445. German original, 1893.

Germany.

James was finishing his *Principles of Psychology* (1890) when Münsterberg first published these ideas. James's text presented a five-stage description of reaction which differed from Wundt's model and, like Münsterberg, put more emphasis on physiological processes. Whereas Wundt had two "physiological" stages at beginning and end, and three "psychophysical" stages in between, James distinguished four purely physiological stages, with only one psychological stage in the middle:

- (1) The stimulus excites the peripheral sense-organ adequately for a current to pass into the sensory nerve;
- (2) The sensory nerve is traversed;
- (3) The transformation (or reflection) of the sensory into a motor current occurs in the centers;
- (4) The spinal cord and motor nerve are traversed;
- (5) The motor current excites the muscle to the contracting point.

As far as James was concerned, Wundt had no empirical justification for dividing the central step into separate acts of perception, apperception and volition. Furthermore, Ludwig Lange's experiments showed that sensorial reactions were too "excessive" and "untypical" to be of much value to experimental psychology. Only times for muscular reaction should be used for quantitative comparisons, James concluded, and he took Wundt's acceptance of Lange's muscular-sensorial distinction to mean that "Wundt has himself become converted to the view which I defend."¹²⁵

James erred, of course, to think that Wundt had given up the distinction between perception, apperception and choice. Wundt retained his reaction model, even though he admitted the difficulty in measuring the duration of any separate stage. Moreover, Wundt continued to regard the sensorial reaction as the most important type for the study of mental action. In his view, the muscular reaction was only a lower limit, an automatic reaction that had little to do with the mental processes he wished to investigate.

¹²⁵ William James, *Principles of psychology* (NY: Holt, 1890), vol. 1, 88-94.

James took a different approach altogether. He argued that reflex actions could be characterized definitively by physiology's quantities of intensity and time; acts of volition, however, were beyond the reach of exact measurement. In Wundt's view, James made the concept of "volition" too narrow and used "reflex" too liberally. Wundt, with his voluntarist psychology, tended not to account actions to reflex if he could argue that central nervous processes played a role. To his way of thinking, James excluded from experimentation any process that was at all psychological, and only allowed measurement of physiological processes.

Although James and Münsterberg had little use for the sensorial reaction, other psychologists in America took more interest in it. In fact, a debate on the sensorial-muscular distinction helped to distinguish an important American school of psychology, functionalism.

E.B. Titchener at Cornell surveyed reaction-time experiments in 1895. He essentially agreed with his friend Külpe, that the subtraction method was flawed, but insisted that muscular and sensorial reaction-types were still useful tools for the analysis of mental action.¹²⁶ J. Mark Baldwin at Princeton, on the other hand, saw the muscular-sensorial distinction as way to characterize differences in individuals. Using unpracticed subjects, he found that some people were disposed to react "sensorially" whereas others tended to react in the "motor" fashion.¹²⁷

There was a debate on the purpose of the reaction-time experiment. Baldwin claimed that individual differences were the important facts of nature which the psychologist should study. Titchener argued that the goal of psychological science was the discovery of the laws of the generalized mind, and he defended the Wundtian use of practiced subjects to exhibit sensorial and motor attitudes in a way that minimized individual differences.¹²⁸

James R. Angell, together with one of his colleagues at the University of Chicago, analyzed the Baldwin-Titchener debate. Further experiments led them to conclude that both sides were correct: Baldwin's unpracticed subjects demonstrated that there were sensorial and muscular *subjects* in

¹²⁶ E.B. Titchener, "Simple reactions," *Mind*, NS, 4 (1895), 74-81.

¹²⁷ J. Mark Baldwin, "Types of reaction," *Psychological review*, 2 (1895), 259-273.

¹²⁸ E.B. Titchener, "The type-theory of the simple reaction," *Mind*, NS, 4 (1895), 506-514; J.M. Baldwin, "The 'type-theory' of reaction," *ibid.*, 5 (1896), 81-89; E.B. Titchener, "The 'type-theory' of simple reaction," *ibid.*, 5 (1896), 236-241.

reaction-time experiments, while Titchener's practiced subjects showed the distinction between sensorial and muscular *reactions*.¹²⁹ Angell, John Dewey, and others associated with the Chicago school of "functionalism," wanted psychologists to stop fighting over fundamental theories of mind and to develop models more adapted to the practical problems at hand.

It was Titchener who first articulated the structuralist and functionalist approaches to psychology. He defended the structuralist approach, identifying it with Wundt's, and argued that the functionalists were premature in their efforts, because not enough was yet known about the structure of mental action.¹³⁰ The reaction-time experiments thus played a role, if perhaps only incidental, in distinguishing the major schools of American psychology at that time, the structuralists and the functionalists.

In Leipzig, reaction experiments had meanwhile taken an entirely different direction: the registration of physiological correlates of emotions. Chapter Five noted that the physiologists and psychologists Mosso, von Frey, and Lehmann experimented in support of Wundt's "central" theory of emotion against the "peripheral" theory of Carl Lange, William James and Münsterberg, who relegated emotions to reflexive behavior rather than to volition. Kurt Danziger, comparing Wundt and James on volition, concludes that they basically differed on "whether 'volitional' processes were present in all directed motor activity, as Wundt held, or whether they operated only on the level of a mental choice among ideas, as James maintained."¹³¹ Wundt found centrally originating impulses to be involved in many more behavioral phenomena than James would allow, and his model kept emotional responses and acts of will within the province of experimental psychology, whereas James separated them.

In pursuit of the connections between feelings and willful action, the Leipzig laboratory studied pulse changes in reaction to experiences that evoked emotional responses. The pulse varied by weakening [geschwächt] or strengthening [verstärkt]; it might also either accelerate [beschleunigt] or slow down [verlangsamt].

¹²⁹ James R. Angell and Addison W. Moore, "Reaction-time: A study in attention and habit," *Psychological review*, 3 (1896), 245-258.

¹³⁰ E.B. Titchener, "The postulates of a structural psychology," *Philosophical review*, 7 (1898), 449-465; E.B. Titchener, "Structural and functional psychology," *Philosophical review*, 8 (1899), 290-299.

¹³¹ Kurt Danziger, "Wundt's theory of behavior and volition," in *Wilhelm Wundt and the making of a scientific psychology*, ed. Robert W. Rieber (NY: Plenum, 1980), 89-115; 110, 111.

As a result of pulse measurements in a variety of circumstances, Wundt outlined his system of "simple feelings." He decided that a stronger and slower pulse was associated with the feeling of pleasure [Lust], a weaker and faster pulse with displeasure [Unlust]. A stronger and faster pulse indicated relaxation [Lösung], whereas weaker and slower pulse meant tension [Spannung]. A stronger pulse with no change in pace was associated with excitement [Erregung], and a weaker one at the unchanged pace indicated composure [Beruhigung] (see top of Figure 7.1).

Wundt thus organized "simple feelings" into three fundamental modalities: pleasure-displeasure [Lust-Unlust], tension-composure [Spannung-Lösung], and excitement-composure [Erregung-Beruhigung]. In addition to pulse, Leipzig researchers worked to correlate responses of respiration [Atmung, see Figure 7.1], blood pressure, and even pupil dilation with these modalities. With analyses of these bodily correlates, they tried to represent common, everyday feelings and emotions (i.e., compounds feelings) in terms of the elementary modalities of feeling. For example, in Figure 7.1, joy [Freude] has strong components of pleasure and excitement, but first tension then relaxation. Anger [Zorn] has displeasure, excitement, and an ambivalence in the tension-relaxation modality.

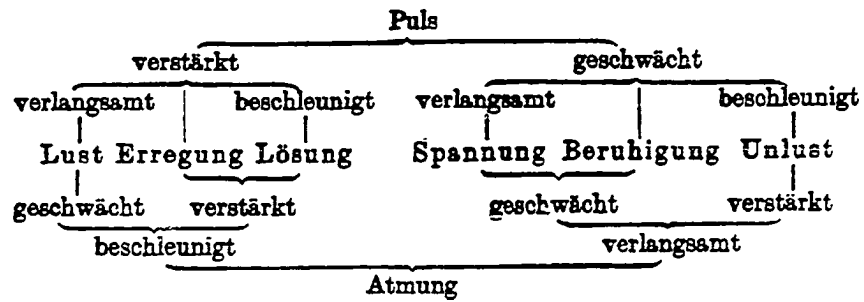
Wundt's tridimensional theory of feelings first appeared in his general textbook of psychology in 1896.¹³² Although the textbook was popular, Wundt's theory of feelings did not have many supporters outside of his associates in Leipzig. Certainly this research program was not so widely influential as the earlier reaction-time studies had been. As Wundt and his associates expounded upon another major theory, Machian positivists among European psychologists, and the quite similar functionalists in America, agreed to exclude such grand theoretical questions. For them the important thing was simply to find experiments that "worked."

The impact of the new positivism on experimental psychology was not at all to Wundt's liking. The relaxation of theoretical requirements allowed technically or physiologically oriented experimentalists in Germany to claim psychology as their domain, even when their work supported no general psychological theory. Dilthey, though he opposed them as much as Wundt did, unwittingly helped the

¹³² Wundt, *Grundriss der Psychologie* (Leipzig: Engelmann, 1896); English version: *Outlines of Psychology*, trans. Charles Judd (Leipzig: Engelmann, 1897). For Wundt's final discussion of progress in this research, see *Grundriss*, 14th ed. (Leipzig: Kröner, 1920), 91-106.

FIGURE 7.1

Wundt's Tridimensional Theory of Feelings.



Wundt, Grundriss der Psychologie, 14th ed. (Leipzig: Kröner, 1920), 104.

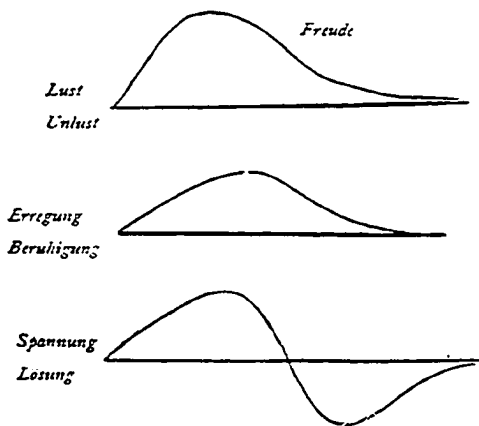


Fig. 327. Schematischer Verlauf eines Lustaffects: »Freude«.

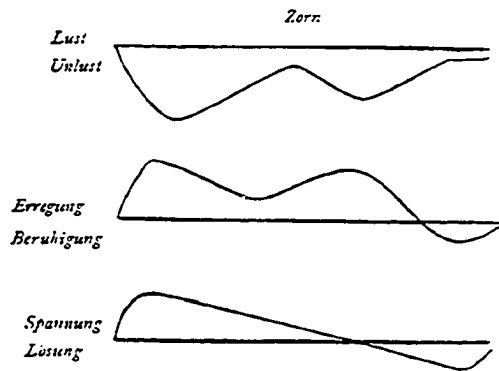


Fig. 328. Schematischer Verlauf eines Unlustaffects: »Zorn«.

Wundt, Grundzüge der physiologischen Psychologie, 5th ed., vol. 3 (Leipzig: Engelmann, 1903), 223.

“technicians” by giving control of psychology in Berlin over to Stumpf, who was sympathetic to the new point of view.

Experimental psychology grew up within philosophy, and therefore was vulnerable to trends in philosophical thought. When Wundt was on the leading edge of the trend in the 1870s and 1880s, his research program prospered. In that environment, under the auspices of the Comtean spirit, a physiologist such as Wundt, or a specialist in psychophysics such G.E. Müller, could even become professor of philosophy at a major German university. By 1893, the change in the relationship between Dilthey and Ebbinghaus signaled a change in the attitude of many philosophers toward the role of natural-scientific experiment in their field. Partly in response to philosophers’ qualms, but mostly as a result of their own positivism, younger specialists in experimental psychology were inclined to dispense with grand theories. The next chapter investigates how this division of experimental psychologists--the Wundtians versus the others--affected the institutional development of the field, as psychologists competed for positions in German philosophy after 1900.

Chapter VIII

Psychology reconsolidates in Leipzig and makes uneven gains in Germany, 1896-1914.

As this chapter opens, Wundt sits comfortably at the head of experimental psychology in Germany. His most serious competition and criticism comes from G.E. Müller in Göttingen and from Stumpf, newly arrived in Berlin, and they do not yet have resources or a following to rival what Wundt has in the Leipzig Institute. By the end of this period, and the beginning of the World War, quite a few experimental psychologists advance to full professorships in philosophy, and more seem headed that way. Although this institutional progress is still too slow for some psychologists, it generally follows lines sanctioned by Wundt. With this expansion, however, come increased challenges to Wundt's vision of philosophy and experimental psychology's importance within it. These challenges are not only from the rival psychologists and their students, but also from some of Wundt's own students. Eventually, the expansion of experimental psychology also provokes very strong reaction from philosophers who deny its usefulness to their field--twentieth-century philosophical thought is generally not as friendly to experimental psychology as nineteenth-century philosophy had been. Experimental psychology's uneven gains in German academia and the controversies between factions of psychologists--and between philosophers and psychologists--create pressures that threaten to tear apart the fabric that Wundt had carefully woven and sewn into the cloak of German philosophy.

A. In the Leipzig Institute for Experimental Psychology.

1. Painful expansion, shortage of good personnel, 1896-1900.

The 1880s and early 1890s were heady and productive years for both Wundt and experimental psychology. Having first become a professor of philosophy in 1874, Wundt built his reputation as a scholar, established the Institute, and attracted many young researchers to his field of specialization. He quickly became a prominent citizen of the university: serving on examination committees, in faculty administration, and as a very popular lecturer. By the mid-1890s he had proven himself as a philosopher, not just a specialist in experimental psychology, by completing a row of texts on logic, ethics, and metaphysics. Then in 1896, his *Grundriss der Psychologie* presented his overview of the entire field of

psychology; experimental psychology was only a part, albeit a very important part of this field.

The success of Wundt's teaching and research program in Leipzig eventually entitled the Institute to better quarters. Chapter Three told how the original Institute started in the *Convict*, then acquired additional rooms previously used for pharmacology, as medical facilities expanded into an area south of the city center. By 1890 the university had decided to tear down the old *Convict* and remodel the main university buildings, the *Augustaeum*, *Johanneum*, and *Paulinum*. (Compare Figure 8.1 to Figure 3.2 on page 77.) During the four years required for that construction project, from winter-semester 1892/93 to winter-semester 1896/97, Wundt's Institute carried on its work in the *Trierianium*, a building (not found in Figure 8.1) that had once housed the gynecological clinic. Wundt was pleased to have an entire floor of a building that was removed from the university construction project:

It was a time of inner growth, in this regard the more fruitful, the more isolated it was from the outside world.... The circumstance that the Institute in the *Trierianium* was provisional had yet another advantage. The provisional housing, which was sufficient in its size and isolation for all essential purposes, made it possible to test carefully the fixtures which would be included in the future, definitive Institute.

[Es ist eine Zeit inneren Wachstums gewesen, für dieses um so fruchtbarer, je mehr es nach aussen in sich abgeschlossen war.... Der Umstand, dass das Institut im *Trierianium* ein provisorisches war, brachte aber noch einen anderen Vorteil mit sich. Diese provisorische Unterbringung, die doch durch ihre Ausdehnung und Abgeschlossenheit allen wesentlichen Zwecken genügte, machte es möglich, die Einrichtungen, die in dem künftigen definitiven Institut getroffen werden sollten, sorgfältig zu erproben.]¹

The new quarters for the Institute provided a grand model of the professional research institute in psychology. Situated between the remodelled *Johanneum* and *Paulinum*, essentially on the site of the old *Convict*, the Institute consisted of fifteen rooms that were convenient to a large lecture hall of 492 seats and a smaller one of 98 seats. (See Figure 8.2) Within the context of the general remodelling of the university, the Saxon ministry lavished its bounty on Leipzig's famous psychologist and made Wundt's laboratory a showplace that would not be matched in European psychology during his lifetime. The Institute remained there until Anglo-American bombers destroyed this university building, and with it whole sections of the city, in raids beginning December 4, 1943.²

¹ Wundt, *Erlebtes und Erkanntes* (Stuttgart: Kröner, 1921), 306-307.

² "Die Zerstörung von Universitätsgebäuden," in *Leipziger Universitätsbauten. Die Neubauten der Karl-Marx-Universität seit 1945 und die Geschichte der Universitätsgebäude*, ed. Heinz Füssler (Leipzig: Bibliographisches Institut, 1961), 19-21.

Renate Drucker, "Die Universitätsbauten 1650-1945," in *Leipziger Universitätsbauten. Die Neubauten der Karl-Marx-Universität seit 1945 und die Geschichte der Universitätsgebäude*, ed. Heinz Füssler (Leipzig: VEB Bibliographisches Institut, 1959), 167-212; 203.

Wundt, "Das Institut für experimentelle Psychologie," in *Festschrift zur Feier des 500 jährigen Bestehens der Universität Leipzig* (Leipzig: Rektor u. Senat der Universität, 1909), vol. 4: *Die Institute und Seminare der Philosophischen Fakultät an der Universität Leipzig. Part 1: Die philosophische und die philosophisch-historische Section*, 118-133; 123.

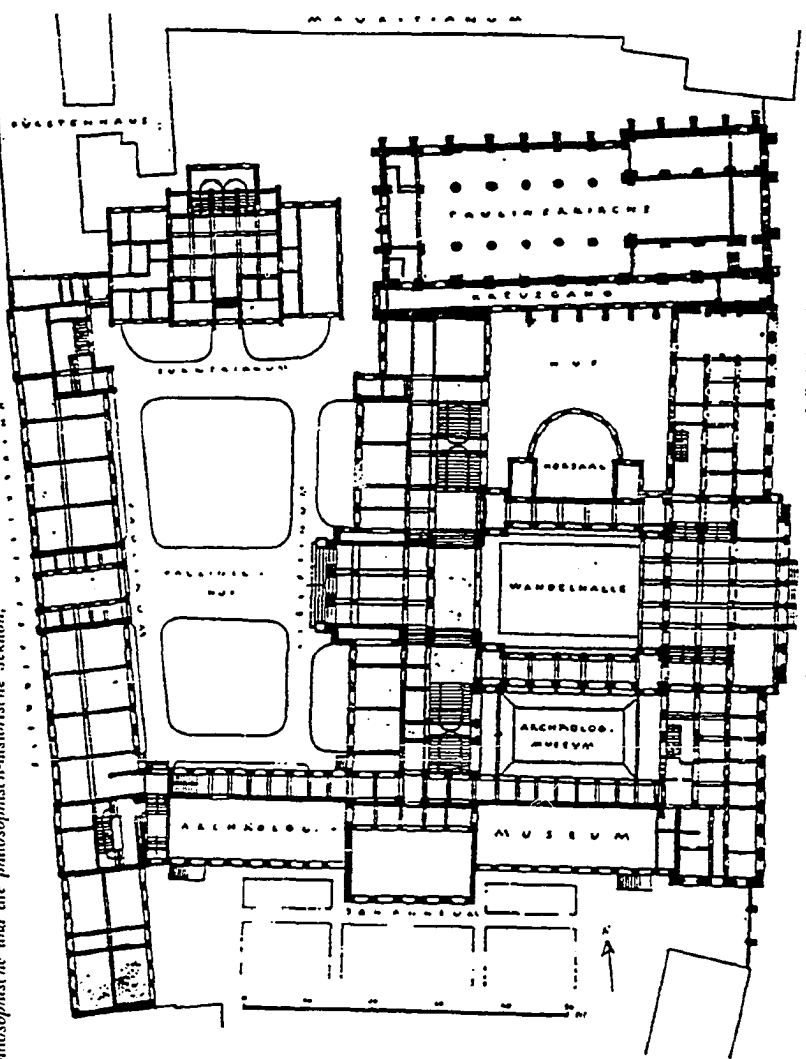
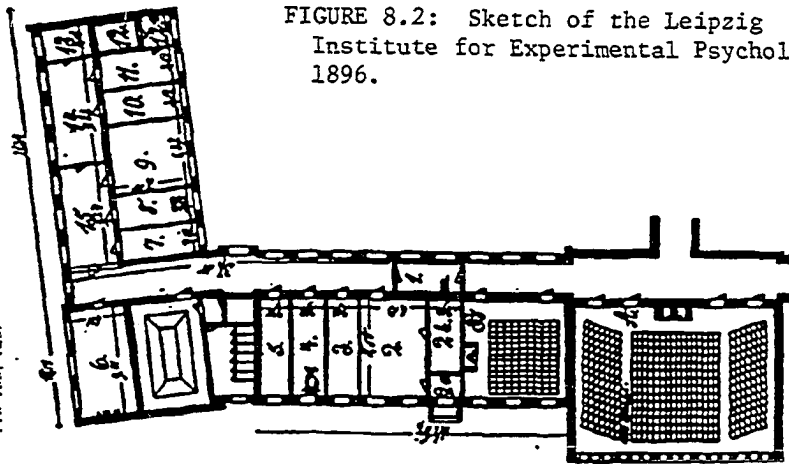


FIGURE 8.2: Sketch of the Leipzig Institute for Experimental Psychology, 1896.



One would expect that the larger, specially built quarters should have accelerated research productivity and helped the Leipzig Institute for Experimental Psychology further dominate the field. In the 1890s, however, as criticism and competition confronted Wundtian psychology, the Institute had problems adjusting to the expansion. Wundt found himself short of good help. At the time of the move into the remodeled university building, Meumann was the Institute's First Assistant, and Kiesow was Second Assistant. Within a year, both of these experienced men were gone--to Zürich and Turin, respectively.

Wundt was not prepared for Meumann's call to Zürich in 1897. He had probably assumed that the position would go to Münsterberg or to a student of Avenarius. When Meumann's good fortune was finally secure, Wundt experienced some difficulty finding a new assistant. He even considered not hiring anyone new and using the money for apparatus instead. In a letter that explained these problems to his wife, Wundt also mentioned the death of a colleague and complained about administrative meetings.³ Wundt's tone was uncharacteristically weary. Administrative duties had always helped give him the influence he needed to build up his facilities, but now that the large Institute was there, academic meetings and examinations were more bothersome. These duties were doubtlessly on the increase as the university experienced another period of rapidly growing enrollment--the number of students in the Philosophical Faculty nearly doubled between 1894 and 1900.⁴ It was a bad time for Wundt to lose his best assistant.

Only a week after the complaining letter to his wife, Wundt promoted Dr. Paul Mentz, who had been Second Assistant for three years, to First Assistant, and he hired *cand. math.* Erich Mosch as Second Assistant.⁵ He was the first Institute Assistant since Cattell who did not already have the doctoral degree. For his *Famulus*, Wundt found a medical student just beginning work in experimental psychology, Robert Müller. (Appendix I charts the Institute staff.)

³ Wundt to Sophie Mau Wundt, 22 June 1897, UAL, Wundt Nachlass, Nr. 1635-3.

⁴ Enrollments with the Leipzig Philosophical Faculty: 1089 in WS 1875/76, to a high of 1297 in WS 1883/84, down to 766 in SS 1894, up to 1173 in WS 1897/98, 1496 in WS 1900/01, and still rising at 2529 in WS 1908/09. Franz Eulenburg, *Die Entwicklung der Universität Leipzig in den letzten hundert Jahren. Statistische Untersuchungen* (Leipzig: S. Hirzel, 1909), 193-194.

⁵ KM to Wundt, 2 July 1897, UAL, Phil. Fak., B1/14(raised)37, Bd III (Psychologisches Institut 1879-1917), B1. 6.

Wundt put the best face on the situation, especially in his letters to Meumann:

We will of course miss you very much. But I hope the new people will get along quite well. Herr Mosch and Herr Müller worked with much eagerness through part of the vacation.

*[Sie werden uns natürlich sehr fehlen. Doch hoffe ich, dass sich die neuen Kräften gut anlassen. Herr Mosch und Herr Müller haben mit vielen Eifer einen Theil der Ferien gearbeitet.]*⁶

Külpe also received a positive report:

Things are following their usual course here. At first I naturally missed Meumann quite a bit. But the new assistants have worked out extremely well and are--what is most important--exceptionally hard-working and dutiful.

*[Hier geht Alles seinen gewohnten Gang. Zunächst habe ich natürlich Meumann recht vermisst. Aber die neuen Assistenten haben sich vortrefflich eingearbeitet und sind--was die Hauptsache ist--ausserordentlich eifrig und pflichttreu.]*⁷

In spite of their hard work and dutiful service, neither Mentz, Mosch nor Müller became well-known psychologists; nor did Wolfgang Möbius, who replaced Mosch as Second Assistant in winter-semester 1898/99. This undistinguished line of assistants is symptomatic of personnel problems in Wundt's Institute around the turn of the century.

Mentz tried, without much success, to follow in the footsteps of Külpe and of Meumann, to whom Wundt wrote,

After much effort, Dr. Mentz is now finally finished with his [optical] spectral research... for his habilitation. Next Wednesday will be his trial lecture. I hope it goes well.

*[Hier ist jetzt Dr. Mentz nach vieler Mühe mit der Spektraluntersuchung..., mit der er sich habilitiert, glücklich fertig geworden, und nächsten Mittwoch soll die Probevorlesung sein. Ich hoffe, dass es gut geht.]*⁸

Wundt's fears were soon confirmed:

Unfortunately Dr. Mentz had a very bad time of it. After he had passed through the other stages of the habilitation with the utmost difficulty [mit Ach und Krach], the trial lecture was an utter failure. He lectured such confused stuff and was obviously so insufficiently prepared (he apparently had planned for only one disputation), that it was impossible to accept the lecture. Now he is to be allowed, since such a case actually never occurred before, to repeat the trial lecture in a half-year. I only hope that the people in the introductory course [in the Institute] will be satisfied with him. He is extraordinarily hard-working and persistent in his work, but these characteristics alone are not sufficient for an academic

⁶ Wundt to Ernst Meumann, 19 October 1897, UAL, Wundt Nachlass, Nr. 699.

⁷ Wundt to Oswald Külpe, 28 December 1897, UAL, Wundt Nachlass, Nr. 112.

⁸ Wundt to Ernst Meumann, 15 January 1898, UAL, Wundt Nachlass, Nr. 701.

career. I cannot deny that the matter worries me.

[Mit Dr. Mentz ist es leider recht unglücklich gegangen. Nachdem die übrigen Stationen der Habilitation von ihm mit Ach und Krach zurückgelegt waren, scheiterte die Probevorlesung gänzlich. Er trug so verworrenes Zeug vor, und war dazu sichtlich so wenig zureichend vorbereitet: er hatte augenscheinlich nur eine Disputation vor sich, dass es unmöglich war, diese Vorlesung zu acceptieren. Es ist ihm nun gestattet worden, da der Fall eigentlich noch niemals vorgekommen ist, die Probevorlesung in einem halben Jahr wiederholen, und ich will hoffen, dass die Leute in Einführungscursus recht von ihm befriedigt sind. Auch ist er ja ausserordentlich fleissig und ausdauernd in seinen Arbeiten. Aber darauf allein lässt sich doch keine akademische Laufbahn gründen. So kann ich nicht leugnen, dass mir die Sache einige Sorgen macht.]⁹

Hard work and persistence might have been sufficient in institute assistants, but when it came to building an academic career, they could not compensate for lack of talent or for poor performance.

So Wundt's worries about replacing Meumann in 1897 turned out to be justified. The first generation of assistants--Cattell, Lange, Külpe, Kirschmann, Kiesow and Meumann--were first-class experimental psychologists whose work contributed substantially to the young field. Their careers were not without problems--Kirschmann and Kiesow had to seek academic positions outside of Germany; Meumann and Külpe had rather undistinguished initial appointments. But even Ludwig Lange, whose poor health denied him an academic career, had been instrumental in steering reaction-time studies to the important experiments on attention.

On the other hand, the alliterative first run of assistants in the big new Institute--Mentz, Mosch, Müller, Möbius--made virtually no contribution to psychology. Mentz finally got through his inaugural lecture to become Privatdozent in 1899, but that was a terminal title for him--he never advanced even to Extraordinarius, and his name disappeared from the Leipzig faculty list during the First World War. Mosch, like many early participants in the Institute, had studied mathematics. He went on to become *Gymnasialoberlehrer* in Berlin-Charlottenburg--a good teaching position, but no place for psychological research. Mentz, Mosch, and Müller each published two articles apiece in *Philosophische Studien*. Wolfgang Möbius received his doctorate in modern languages in 1898,¹⁰ served three semesters as Second Assistant, and never published anything on psychology. Of this interim group of assistants, Wundt had highest hopes for the young medical student, Robert Müller. He hired Müller as First Assis-

⁹ Wundt to Meumann, April 11, 1898, UAL, Wundt Nachlass, Nr. 702.

¹⁰ UAL, Phil. Fak., Promotionen, Wolfgang Möbius, 28 June 1898.

tant in winter-semester 1899/1900. "I am particularly interested that this will enable Dr. Müller to make the transition to an academic career." [Namentlich hielt ich es für durchaus geboten, dem Dr. Müller dadurch den Übergang in die akademische Karriere zu ermöglichen.]¹¹

In the meantime the big new Institute was swamped with work. Wundt wrote to Meumann:

Here in the Institute I am suffering from overcrowding, particularly by foreigners, and most especially by those who want to do their own projects. It is really terrible that the other institutes are so miserably underdeveloped because of lack of funds that I cannot send the people away.

[Hier im Institut leide ich etwas unter dem Andrang besonders an Ausländer, überhaupt, aber an solchen, die eigene Arbeiten machen wollen. Es ist recht schlimm, dass die andern Institute so kümmerlich gehalten werden aus Mangel an Mitteln, dass man die Leute nicht wegschicken kann.]

Things were beginning to improve for Martius in Prussia, and Wundt had some hope that the pressure on Leipzig might soon be relieved.

At least now one thing has happened, as you surely have heard: Götz Martius has been called to Kiel, though he does not actually go there until the fall. The story of this appointment, of which I received a running account both from Kiel and from Martius himself, unfortunately casts a dim light upon the current state of universities in Prussia. So I am therefore all the more pleased that *indeed Martius* finally got the position.

[Jetzt ist wenigstens das eine geschehen, dass, wie Sie wohl gehört haben, Götz Martius nach Kiel berufen ist, freilich erst nächsten Herbst dahin geht. Diese Berufungsgeschichte, über die ich ziemlich auf dem Laufenden gehalten wurde, von Kiel aus wie von Martius selbst, liess leider ein betrübendes Licht auf die jetzigen Universitätszustände in Preussen fallen. Um so mehr freut es mich, dass schliesslich *doch Martius* die Stelle erhalten hat.]¹²

By supervising young researchers in experimental projects, Martius could share some of the burden of training psychologists, without sacrificing talent to the competition in Göttingen or Berlin.

Wundt did not, however, want to lose his trained psychologists. When Meumann inquired whether any recent Leipzig doctorates might come habilitate in Zürich and assist in psychological research there, Wundt's response was distinctly negative:

Here we have *more than enough candidates for habilitation*. But those whom I want to keep as assistants--Dr. Müller, who began as assistant on Oct. 1, and Dr. Wirth, who will become assistant on April 1--I do not *want* to recommend; and they would also probably not want to go to Zurich. As for the others, I *cannot* in good conscience recommend them.

[*Habilitanden haben wir hier mehr als genug. Aber diejenigen, die ich selbst als Assistenten behalten möchte--Dr. Müller, der am 1. Okt. als Assistent eingetreten ist, und Dr.*

¹¹ Wundt to Ernst Meumann, 1 January 1900, UAL, Wundt Nachlass, Nr. 706.

¹² Wundt to Meumann, April 11, 1898, UAL, Wundt Nachlass, Nr. 702.

Wirth, der am 1. April als Ass. eintreten soll--will ich nicht empfehlen, die würden auch schwerlich nach Zürich gehen. Die andern kann ich nicht mit gutem Gewissen empfehlen.]¹³

Sitting in his beautiful new quarters for the Institute for Experimental Psychology, Wundt closed out the century on this note of general dissatisfaction with his advanced students.

The new century brought a renewal of scientific productivity in the Institute. On the auspicious date of January 1, 1900, Wundt wrote optimistically to Meumann:

Here in the laboratory there has been quite a lot of movement this semester. In the fall Müller replaced Mentz as Assistant, and at Easter the Second Assistant will begin--Dr. Wirth, who came here a few semesters ago from Munich. Both are very capable [tüchtig]. [Hier im Laboratorium ist in diesem Semester ziemlich viel Bewegung. Im Herbst ist Müller als Assistent für Mentz eingetreten, und Ostern wird als zweiter Assistent ein vor einigen Semestern aus München gekommener Dr. Wirth eintreten. Beide sind sehr tüchtig.]¹⁴

Another capable experimenter soon arrived, a student of Külpe's:

Mr. Dürr has made a very good impression on me. He is apparently a very clever observer and appears to have a variety of interests. So something certainly can come of him if he remains true to experimental psychology.

[Herr Dürr hat mir einen recht guten Eindruck gemacht. Er ist offenbar ein ganz geschickter Beobachter und scheint mannigfache Interessen zu haben. So kann denn schon etwas aus ihm werden, wenn er der experimentellen Psychologie treu bleibt.]¹⁵

Wundt still had a positive report for Külpe at year's end:

Mr. Dürr continues to prove himself to be a keen and independent experimenter. He now works a lot with my Second Assistant Dr. Wirth, who recently habilitated and is very capable. And Mr. Dürr will surely benefit greatly from this teamwork.

[Herr Dürr bewährt sich fortan als ein eifriger und selbständiger Experimentor. Er arbeitet jetzt viel mit meinem zweiten Assistenten Dr. Wirth zusammen, der sich kürzlich habilitirt hat und sehr tüchtig ist. Auch Herr Dürr wird von dieser Arbeitsgemeinschaft gewiss grossen Vortheil haben.]¹⁶

Wundt was not apt to be pleased by Institute Assistants who were too independent, now that they essentially ran the day-to-day activity there. Robert Müller, for example, became critical of Wundtian psychology and argued for physiological explanations to the exclusion of psychological ones. He decided to leave psychology and go into medical practice.¹⁷ Ernst Dürr served as Second Assistant, got

¹³ Wundt to Meumann, 29 October 1899, UAL, Wundt Nachlass, Nr. 705.

¹⁴ Wundt to Ernst Meumann, 1 January 1900, UAL, Wundt Nachlass, Nr. 706.

¹⁵ Wundt to Oswald Külpe, 3 January 1900, UAL, Wundt Nachlass, Nr. 397.

¹⁶ Wundt to Oswald Külpe, 30 December 1900, UAL, Wundt Nachlass, Nr. 399.

his doctorate with Wundt in 1902, then went back to Würzburg to habilitate with Külpe, who did not criticize his theories as harshly as Wundt had.

At the end of 1900, Wundt's assessment of developments in Leipzig was both positive and negative:

Here there is not much new to report. My two present assistants, Müller and Wirth, are very capable people. The latter has just habilitated; he made a very good impression on everyone, not only with his habilitation essay, which you will of course have read in the *Studien*, but also with his inaugural lecture. Mentz is going his own peculiar way. He is giving a lot of lectures--in this semester, for example, general psychology (4 hrs.)--how well, I do not know. And he seems to have come to a standstill with his experimental work. Brahn appears suddenly like a comet, only to disappear again for a long while. Whether anything will ever come of his habilitation, I have no idea. On the other hand, Raoul Richter is apparently an adroit lecturer who will make his own way. Of course he is a rather one-sided philosopher and literary critic.

[Von hier ist nicht viel Neues zu berichten. Meine zwei jetzigen Assistenten, Müller und Wirth, sind zwei recht tüchtige Leute. Der letztere hat sich kürzlich habilitiert, und nicht nur mit seiner Habilitationsschrift, die Sie ja in den Studien gesehen haben werden, sondern auch mit seiner Antrittsvorlesung allseitig einen guten Eindruck gemacht. Mentz geht seine absonderliche Wege. Er liest eine Menge von Vorlesungen, in diesem Semester z.B. die ganze Psychologie 4 stündig,--wie, das weiss ich aber nicht, und mit seinen experimentellen Arbeiten scheint er ins Stocken geraten zu sein. Brahn taucht kometenartig auf, um dann wieder auf längere Zeit zu verschwinden. Ob aus seiner Habilitation hier noch etwas wird, weiss ich nicht. Dagegen ist Raoul Richter offenbar ein fixer Dozent, der seinen Weg machen wird. Freilich ist er wohl einseitig Philosoph und Literaturhistoriker.]¹⁸

Max Brahn, like Meumann, was interested in applying experimental psychology to pedagogical problems. Raoul Richter, a Nietzsche scholar, was Wundt's favorite among his students who were not experimentalists. Both men were productive scholars and teachers, but neither could provide the help Wundt needed in the Institute. Wirth was the vanguard of a new generation in the Institute, after the hiatus in psychological talent represented by Mentz, Mosch, Müller, and Möbius.

2. Restaffing with help from Munich: Lipps's students, Wirth, Krueger, and Klemm.

Wilhelm Wirth (1876-1952) first learned psychology in Munich, as did other important members of the "second generation of Leipzig psychologists." Munich University had no functioning psychological laboratory then, but it did have an influential teacher of psychology. As the university in the Bavarian capital was surpassing Leipzig in enrollment,¹⁹ Theodor Lipps arrived in 1894 to teach

¹⁷ "Wilhelm Wirth," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1930), 283-327; 314.

¹⁸ Wundt to Ernst Meumann, 16 December 1900, UAL, Wundt Nachlass, Nr. 709.

philosophy. Since his years in Bonn with Götz Martius, Lipps had always been interested in psychology, and, to some extent, experimental psychology. Although he outfitted a teaching laboratory when he was professor at Breslau, Lipps did no experimental research himself. In Munich he let the remains of Stumpf's apparatus gather dust in a corner of the seminar room²⁰ and sent students interested in experimentation to Wundt. Two of these took their doctorates with Lipps--Wirth and Krueger. Another, Otto Klemm, took that degree with Wundt.

Felix Krueger (1874-1948) arrived in Wundt's Institute a semester before Wirth did, in winter-semester 1897/98. For about a year they trained together in the Institute; then Krueger went to Kiel in winter-semester 1899/1900 to study with Götz Martius. Although Krueger and Martius were for some reason incompatible, Krueger stayed in Kiel. With Wundt's encouragement he became assistant to Victor Hensen, the physiologist whose studies of auditory systems picked up where Helmholtz had left off. Wundt advised Krueger to stay with Hensen no longer than four semesters if he planned to return to philosophy.²¹

As Krueger gained wider experience in Kiel, Wilhelm Wirth (1876-1952) settled down to work for Wundt. For his habilitation he proposed a critical examination of Götz Martius's experiments on the visual phenomenon of negative after-images.²² Wundt approved the plan, but wondered whether "a more psychological theme" might not better suit Wirth's plans for the future [ob ein mehr psychologisches Thema Ihren künftigen Pläne nicht mehr entsprechen würde]. Such a narrow psychophysical study might not be the best way to inaugurate a career as a university teacher of philosophy. Wundt urged Wirth to find "a wider psychological study of the experimental sort" [einen umfassenderen psychologischen Arbeit experimenteller Art].²³ In spite of the technical nature of the work on after-images,²⁴ Wirth successfully habilitated in philosophy, as noted in Wundt's letter of late 1900, quoted

¹⁹ J. Conrad, "Allgemeine Statistik der deutschen Universitäten," in *Die deutsche Universitäten (für die Universitätsausstellung in Chicago 1893)*, ed. W. Lexis, vol. 1 (Berlin: A. Asher, 1893), 115-168; 188, Table I.

²⁰ "Otto Klemm," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1930), 153-180: 157.

²¹ Wundt to Felix Krueger, 3 March 1901, UAL, Wundt Nachlass, Nr. 377.

²² Götz Martius, "Das Gesetz des Helligkeitswertes der negativen Nachbilder," *Beiträge zur Psychologie und Philosophie* (one volume only, 1895-1905), 17-94.

²³ Wundt to Wilhelm Wirth, 24 January 1899, UAL, Wundt Nachlass, Nr. 943.

²⁴ Wilhelm Wirth, "Der Fechner-Helmholtz'sche Satz über negative Nachbilder und seine Analogien," *Philosophische Studien*, 16 (1900), 465-567; 17 (1901), 311-430, 563-686.

above.

Wirth was Second Assistant starting in summer-semester 1900, then he moved up to First Assistant in summer-semester 1901, when Robert Müller left the Institute and Dürr became Second Assistant.

Wirth remembered urging the return of Krueger to Leipzig:

When Dürr... wished to return to Würzburg, I suggested to Wundt that F. Krueger be appointed as his successor, so that he too might work toward admission to the faculty, which at present seemed impossible at Kiel with Martius. With this promise of Wundt that he would also support Krueger's admission to the faculty, I was able to bring the latter to accept the offer, which turned out happily for him."²⁵

Indeed it turned out well for Krueger--he not only replaced Dürr, in a sense he also displaced Wirth.

Wundt had to do a little bargaining to bring Krueger back to the Institute. He advised Krueger to give up the plan to habilitate at Kiel, since Martius opposed the idea, to bring the work with Hensen to an orderly end, and to habilitate in Leipzig.²⁶ Krueger was ready to work in the Institute, provided that Wundt would not give him the title "Second Assistant." Krueger did not want to be second in status to Wirth, his junior, so Wundt agreed simply to list two "Assistants" and not denote rank.²⁷

Krueger habilitated during his first semester back in Leipzig. His inaugural essay, based on acoustical research carried out in Kiel, began an extensive critical study of Stumpf's theory of tonal perception.²⁸ A talented and widely learned experimentalist who could challenge Stumpf in his own area of expertise, Krueger became a favorite of Wundt's. If he had originally gone to Kiel to study with Martius, it was the training in physiological acoustics that turned out to be more important to Krueger's career.

For over three years, winter-semester 1902/03 through winter-semester 1905/06, Wirth and Krueger worked together as Institute Assistants, and both were productive experimental psychologists. Their capable service once more brought stability to the Institute, after the five years of struggle following Meumann's departure for Zürich.

²⁵ "Wilhelm Wirth," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1936), 283-327; 314.

²⁶ Wundt to Felix Krueger, 10 May 1902, UAL, Wundt Nachlass, Nr. 378.

²⁷ Wundt to Felix Krueger, 25 June 1902, UAL, Wundt Nachlass, Nr. 379.

²⁸ Felix Krueger, "Zur Theorie der Combinationstöne," *Philosophische Studien*, 17 (1901), 185-310.

Krueger left Leipzig in 1906 to accept Prussian government sponsorship to teach in Buenos Aires, Argentina. By then a third Lipps student, Otto Klemm (1884-1939), had his doctoral degree and was ready to replace Krueger. A Leipzig native from a family of prominent publishers, Klemm began his studies in Munich. Although he was there only one year, Klemm, like Wirth and Krueger, was inspired by Theodor Lipps. When he decided that his interest was the experimental approach to psychology, he went back to the Leipzig Institute, where he worked with Krueger on acoustical psychology.²⁹

When Klemm became Institute Assistant, the ever-present Wirth was promoted to unsalaried Professor Extraordinarius. Wirth's position as Institute Assistant still carried its modest salary of 1200 marks. In 1908 Wirth was made *Mitdirektor* of the Institute, and his salary was doubled.³⁰ Wundt hired another Institute Assistant, Paul Salow. (See Appendix I.) Wirth and Klemm remained in Leipzig for the rest of their careers. In a sense they were stuck there, limited to their specialities, limited in career mobility by circumstances and, it appears, by personality problems. Krueger, however, was headed for greater success.

As his second generation of psychologists stabilized the training program in the Institute, Wundt tried to get the first generation of Leipzig psychologists to assume more leadership of psychology in the German-speaking universities.

B. Progress and problems for Leipzig's first generation of psychologists, 1900-1910.

1. Replacing *Philosophische Studien* with *Archiv für die gesamte Psychologie*.

a. "The entire field of psychology."

In 1902, the year Krueger rejoined the Leipzig Institute, Wundt celebrated his seventieth birthday. At this juncture he planned to transfer some of his responsibilities to younger psychologists.

Part of the transfer involved Wundt's retirement as journal editor. He closed the *Philosophische Studien* with the eighteenth volume and dedicated the nineteenth and twentieth volumes to festschrift

²⁹ "Otto Klemm," in *A history of psychology in autobiography*, ed. Carl Murchison, vol. 3 (Worcester, MA: Clark U. Press, 1930), 153-180; 156-157.

³⁰ KM to Wundt, 12 June 1908, UAL, Phil. Fak. B1/14(raised)37, Bd III (Psychologisches Institute 1879-1917), Bl. 25.

articles compiled by Külpe, according to a notice in an American journal.³¹ During a celebration at Tambach in the Thuringian Forest on August 16, Wundt received the festschrift. A famous photograph shows him surrounded that day with his family, close friends, younger colleagues, and his publisher, E. Reinicke of Engelmann Verlag.³² With these associates, Wundt completed plans for a new psychological journal. The next month he began sending letters of advice to its editor, Ernst Meumann.

Bringmann and Ungerer give an intriguing description of the conception of the *Archiv für die gesamte Psychologie*, whose title could be rendered in English as "Archive for the entire field of psychology":

Eager to preserve the influence of his own brand of experimental psychology and his voice in academic appointments, Wundt was at least initially under the impression of being in control of the new venture. On the other hand, Meumann and his associates planned to use Wundt's prestige to expand the experimental psychology which he wanted to preserve in such a pristine condition.³³

It was not only "his own brand of experimental psychology" that Wundt was concerned with, but also his vision of the "entire field of psychology."

The new journal had a different task and a different format than *Philosophische Studien*. That journal had been part of Wundt's effort to justify *experimental* psychology as a part of philosophy. This much having apparently been accomplished, the *Archiv* would be more comprehensive in its coverage of psychology and would include reviews of the literature on all psychological topics, something that *Philosophische Studien* did not do. According to Wundt's notice in the closing article of his journal, *Archiv* would "restrict itself to psychology but embrace its branches, extending to *Völkerpsychologie* in addition to experimental psychology insofar as this is possible in view of the current state of this science."³⁴ One reason Wundt gave up journal editorship was to devote more time writing his systematic treatises on *Völkerpsychologie*, those long-planned studies of psychological aspects of language, art, myth, religion, society, culture, and history.³⁵

³¹ *Psychological review*, 7 (1900), 427.

³² The photograph is reproduced, among other places, in Walter B. Pillsbury, *A history of psychology* (NY: Norton, 1929), frontispiece.

³³ Wolfgang G. Bringmann and Gustav A. Ungerer, "Experimental vs. educational psychology: Wilhelm Wundt's letters to Ernst Meumann," *Psychological research*, 42 (1980), 57-73; 62.

³⁴ Wundt, "Schlusswort des Herausgebers," *Philosophische Studien*, 18 (1903), 793-795.

³⁵ Wundt, *Völkerpsychologie. Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythos, und Sitte*, 10 vols., various editions (Leipzig: Engelmann, 1900-1912; Leipzig: Kröner, 1913-1920).

Although the *Archiv* was to be comprehensive and international, Wundt had certain restrictions in mind. His letters to Meumann concerning the choice of collaborating editors [Mitarbeiter], reviewers, and contributors, "reveal what he candidly thought about many contemporary psychologists and philosophers."³⁶

Wundt, for example, wanted to include only those foreign contributors who were not already associated with other journals of psychology or philosophy, and who would write in German. Meumann, on the other hand, wanted to bring old friends from his Leipzig days, Frank Angell and E.B. Titchener, onto the board of editors. Wundt opposed this idea. The *Archiv*, he reasoned, did not need to publish in English or have prominent Americans listed on the title page in order to be read in America. Moreover, Scripture, Stratton, or Judd would be better choices--Titchener was already an editor of *Mind* and of the *American journal of psychology*.³⁷ Incidentally, all of the Americans under discussion here had taken their doctoral degrees with Wundt.

Wundt was inclined to keep limits on the international scope of the *Archiv*, as demonstrated by what he wrote to Meumann when Titchener objected to making August Kirschmann a collaborating editor:

I think that it should not disturb you too much that Titchener called the inclusion of Kirschmann 'a mistake.' Titchener never liked Kirschmann, even back in their days together in Leipzig. Besides that, among the contributors to the *Archiv*, Kirschmann counts not as an American, but rather as a *German*--a characteristic for which his American colleagues simply cannot excuse him.

[Dass Titchener die Nennung Kirschmanns 'a mistake' nennt, sollte Sie wie ich meine, nicht allzu sehr beunruhigen. T. ist dem Kirschmann schon in der Leipziger Zeit nie hold gewesen. Überdies figuriert ja K. unter den Mitarbeiter des Archivs nicht als Amerikaner, sondern als *Deutscher*, eine Eigenschaft, die ihn freilich seine amerikanischen Kollegen nicht verzeihen können.]

Wundt acquiesced to Meumann's choice of Frank Angell and Titchener but requested that Edward Scripture also be included as collaborating editor. Scripture was Wundt's favorite American psychologist, and he had just come to Munich to begin studies of the psychology of phonetics, a new field that interested Wundt. Moreover, Scripture was not currently involved with any American journal. What

³⁶ Bringmann and Ungerer [see note 33], 63.

³⁷ Wundt to Ernst Meumann, 23 October 1902, UAL, Wundt Nachlass, Nr. 713.

Wundt did not mention, but must have known, was that Scripture had just been fired at Yale, where he had edited his own series on psychology. As Wundt saw things, Scripture was back in Germany, having never really left German psychology.

Wundt summarized his attitude toward American participation in the *Archiv*:

I hope that the inclusion of foreign collaborating editors [on the title page] will not diminish the *German* character of the *Archiv*, and that in the future only *articles written in German* will be accepted. The Americans should either translate their work or have it translated.

[Ferner hoffe ich, dass eine Herbeziehung auswärtiger Mitherausgeber den *deutschen* Charakter des Archivs nicht beeinträchtigen soll, dass also auch in Zukunft nur *Deutsch geschriebene Beiträge* Aufnahme finden. Die Amerikaner müssten alle ihre Arbeiten übersetzen oder übersetzen lassen.]³⁸

As it turned out, Meumann decided to put no Americans at all on the title page, save Kirschmann of Toronto. Wundt was pleased by this outcome.³⁹

Wundt's attitude toward the Scandinavians was more welcoming. They had no psychological journal of their own, and they were accustomed to writing in German. Alfred Lehmann was "an eminently capable experimenter," in spite of his "weaknesses as a psychologist." [...Lehmann (von seinen Schwächen als Psycholog abgesehen) ein hervorragend tüchtiger Experimentor ist ...]⁴⁰ For the editorial board, Wundt suggested Harald Höffding as well: "not only a good name, but also a capable and worthy collaborator, ... who among all the non-experimental psychologists is nevertheless one of the closest to the experimental direction" [...nicht nur einen guten Namen, sondern einen tüchtigen und wertvollen Mitarbeiter ..., der ... von allen nicht-experimentellen Psychologen doch der experimentellen Richtung mit am nächsten steht]. Wundt understood that the two Danes were friends, in spite of their polemics on "associative and immediate recognition." Although he was the senior scholar, Höffding would probably not object to being named a collaborating editor later than Lehmann; everyone understood that the first volume of the *Archiv* included mostly experimentalists, whereas the second volume brought in psychologists who did not themselves experiment [...da ja mit dem zweiten Band erst die Heranziehung der anderen, nicht selbst experimentierenden Psychologen angetreten ist].⁴¹

³⁸ Wundt to Ernst Meumann, 5 June 1903, UAL, Wundt Nachlass, Nr. 716a.

³⁹ Wundt to Ernst Meumann, 11 July 1903, UAL, Wundt Nachlass, Nr. 717.

⁴⁰ Wundt to Ernst Meumann, 23 October 1902, UAL, Wundt Nachlass, Nr. 713.

⁴¹ Wundt to Ernst Meumann, 11 July 1903, UAL, Wundt Nachlass, Nr. 717.

Wundt's notion of the breadth of "the entire field of psychology" is best revealed in the discussion of German participants in the journal. Of course, Wundt and Külpe were collaborating editors, as was Emil Kraepelin, the psychiatrist who had been an enthusiastic supporter of the *Philosophische Studien* from its inception. Kraepelin's experimental, analytical, and classificatory psychopathology fit into Wundt's vision of psychological science; the lead article in the premier volume of *Archiv*, following Meumann's editorial introduction, was Kraepelin's.⁴² Wundt advised Meumann to make Götz Martius (Kiel) and Gustav Störing (Meumann's colleague in Zürich) collaborating editors as well. All of these people had worked with Wundt in Leipzig.

So had Karl Marbe (Extraordinarius, Würzburg), but Wundt was opposed to including him on the editorial board. Marbe, he argued, "had compromised experimental psychology so much" in his recent work on judgment (this departure from Wundt's experimental method is discussed below) that he should be prevented from compromising the *Archiv* as well.⁴³ Including Marbe would, in Wundt's estimation, be as bad as including Münsterberg.⁴⁴ Other major German psychologists, such as Stumpf and G.E. Müller, were on the editorial board of Ebbinghaus's *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, and their names did not enter the discussion of contributors to the *Archiv*.

Theodor Lipps (Munich) was also a collaborating editor for Ebbinghaus, but Wundt urged Meumann to list Lipps on the title page of the new journal. Whether his collaboration "can be reconciled with his relationship to Ebbinghaus is of course his business, not ours." Lipps was a contributing editor to several series, and Wundt did not see that his joining the *Archiv* would create any conflict. Obviously, Wundt was eager to gain the support of one of his favorite theoretical psychologists. Winning Lipps from Ebbinghaus would be even better than winning Scripture from the Americans.

Wundt also recommended Friedrich Jodl, professor of philosophy in Vienna, as collaborating editor. "Not an experimental psychologist" but "closely connected to the whole movement" [steht aber doch die ganzen Richtung nahe], Jodl could contribute reviews on history of psychology and history of ethics.⁴⁵

⁴² Emil Kraepelin, "Über Ermüdungsmessungen," *Archiv für die gesamte Psychologie*, 1 (1903), 9-30.

⁴³ Wundt to Ernst Meumann, 5 June 1903, UAL, Wundt Nachlass, Nr. 716a.

⁴⁴ Wundt to Ernst Meumann, 23 October 1902, UAL, Wundt Nachlass, Nr. 713.

⁴⁵ Wundt to Ernst Meumann, 5 June 1903, UAL, Wundt Nachlass, Nr. 716a.

With its second volume, the editorial board of the *Archiv* had these members: Höffding (Copenhagen), Jodl (Vienna), Kirschmann (Toronto), Kraepelin (Munich), Külpe (Würzburg), Lehmann (Copenhagen), Theodor Lipps (Munich), Martius (Kiel), Störring (Zürich), Wirth and Wundt (Leipzig). The non-experimentalists added to the title page in the second volume--Höffding, Jodl, and Theodor Lipps--had not worked in the Leipzig Institute. All the others had trained with Wundt. Kirschmann, Kraepelin, Külpe, Lehmann, Martius, and Störring were the established first generation of Leipzig psychologists, hand-picked by Wundt for leadership of the field. Wirth was the link to the second generation still working in the Leipzig Institute for Experimental Psychology.

The editorial board reflects Wundt's attitude toward the institutional relationship between psychology, philosophy, and physiology. Unlike Ebbinghaus's *Zeitschrift*, the *Archiv* had no editors who were professors of physiology. All were professors of philosophy, except Kraepelin, a professor of psychiatry. If Wundt and his followers were interested in liberating psychology from anything, it was not philosophy, but physiology.

Wundt was very particular that the journal would set forth the appropriate philosophical viewpoint. Meumann suggested asking for articles from Alexius Meinong, who had been presiding over a psychological laboratory in Graz since 1894 and had gathered a group of researchers there. Wundt wanted to draw a line here, and his reasons are so revealing that they warrant quotation in full.

Concerning your inquiry about Meinong, I would like to caution reserve toward him and those similar to him. To my mind, it is certainly not yet time to expand the *Archiv* into a forum for all possible tendencies in psychology [einem Sprechsaal für alle möglichen psychologischen Richtungen]. As things are going now, it appears to me that it would be most useful to limit representation more or less to those tendencies implied by the names of the collaborating editors on the title page, which now include Lipps, Höffding and Jodl. This scope is wide enough, yet it excludes that entire, more or less Scholastic reflection-psychology of Brentano's direction, as well as the truly speculative psychologists [mehr oder minder Scholastische Reflexionspsychologie...Brentano'scher Richtung sowie die eigentlich spekulativen Psychologen].

If you accept Meinong's theoretical work, then the journal completely loses its character, and no one will know what to make of it. Then it will have forfeited its right to exist along side of Ebbinghaus's *Zeitschrift* and the *Archiv für systematische Philosophie*, which is inspired by Erdmann and consorts.

So I would advise you to tell Meinong, in the most friendly way, that you will gladly accept purely experimental work from him, Höfler, and Witasek; but you should say to him openly that the general philosophical standpoint of the journal, which it appears must be maintained at least for a while longer, unfortunately makes it impossible to accept theoretical articles as well from him and from his like-minded colleagues.

It is possible that the time will come when the *Archiv*, like Pfüger's *Archiv für die gesamte Physiologie*, will no longer have to maintain such boundaries. But for the time being it seems to me that we are not so far along in psychology.

[Was die Anfrage an Meinong betrifft, so möchte ich doch ihm und seinesgleichen gegenüber zur Reserve mahnen. Die Zeit, das Archiv zu einem Sprechsaal für alle möglichen psychologischen Richtungen zu erweitern, scheint mir denn doch noch lange nicht gekommen. Wie die Dinge jetzt fahren, scheint es mir wirklich am nützlichsten, den Umkreis der Anschauungen, die hier ihre Vertretung finden, doch ungefähr so weit einzuschränken, als die Namen der jetzt nach dem Zuzug von Lipps, Höffding, und Jodl auf dem Titel stehenden Mitarbeiter dies andeuten. Dieser Umkreis ist weit genug, schliesst aber doch die ganze, mehr oder minder scholastische Reflexionspsychologie Brentano'scher Richtung sowie die eigentlich spekulativen Psychologen aus. Wenn Sie Meinongs theoretische Arbeiten aufnehmen, so verliert die Zeitschrift vollständig diesen Character, und Niemand weiss, was er aus ihr machen soll. Sie hat dann eigentlich ihr Existenzrecht neben der Ebbinghaus'schen Zeitschrift und dem Archiv für systematische Philosophie, welches von Erdmann und Konsorten inspiriert ist, verwirkt. Ich würde also raten, Meinong auf das freundlichste mitzuteilen, dass *rein experimentelle* Arbeiten von ihm, Höfler, Witasek gern aufgenommen werden, ihm aber offen zu sagen, der allgemeine philosophische Standpunkt der Zeitschrift, den festzuhalten noch mindestens für längere Zeit geboten erscheine, mache es Ihnen leider unmöglich, auch *theoretische* Arbeiten von ihm und seinen gesinnungsverwandten Mitarbeitern aufzunehmen. --Es ist ja möglich, dass einmal eine Zeit kommt, wo das Archiv, ähnlich wie in der Physiologie das Pfügersche an solche Grenzen sich nicht zu halten braucht. Aber vorläufig sind wir doch, wie ich meine, in der Psychologie noch lange nicht so weit.⁴⁶

Psychology, as Wundt saw things, still needed protection from those who would confuse it with their "Scholastic" philosophy.

Wundt hoped that the reviews in the *Archiv* would help define "the entire field of psychology," so he gave Meumann detailed advice on who the reviewers should be and what they should do. By including essay reviews of several related works, in addition to reviews of individual writings, the *Archiv* would improve on Ebbinghaus's "disorganized" review section [dem Ebbinghaus'schen Verfahren der planlos durcheinander gewürfelten Referate]. Since the reviewers had so much responsibility for organizing and characterizing the various subfields of psychology, they had to be chosen carefully and treated as "real collaborators rather than as jobbers and hacks" [als wirkliche *Mitarbeiter*, nicht als *Handlanger*]. In this way the *Archiv* would avoid the "dissipated system" [Zettelkastensystem] used by Ebbinghaus and Eilhard Wiedemann (review editor for *Annalen der Physik*), who employ "degenerated review systems whose uselessness is fairly generally acknowledged" [Abarten des Referierwesens, deren Nutzlosigkeit ziemlich allgemein anerkannt ist]. Wundt wanted the *Archiv* to be the useful organ for

⁴⁶ Wundt to Ernst Meumann, 9 October 1903, UAL, Wundt Nachlass, Nr. 719.

psychology that *Fortschritte der Physik* and *Ergebnisse der Physiologie* were for physics and physiology.⁴⁷ For contributors other than the collaborating editors, Wundt recommended reviewers such as G.F. Lipps, for literature on psychophysics,⁴⁸ and Friedrich Kiesow of Turin, for reviews on “lower senses” (taste, smell, touch).⁴⁹

Wundt paid special attention to the reviews of *Völkerpsychologie*, his major area of research and writing at that time. He convinced Meumann to move that topic from the category of “border and auxiliary sciences” [Grenz- und Hilfswissenschaften] to the main body of psychology [die eigentliche Psychologie]. Meumann would not agree, however, to omit altogether the occult and telepathy, topics that were not part of Wundt’s vision of “the entire field of psychology.”⁵⁰

The important thing about *Völkerpsychologie*, Wundt admonished Meumann, was to get reviews of scientific quality. Alfred Vierkandt’s first piece for the *Archiv* evoked his condemnation on that score. “Journalistic scribbling” [Lohnschreiberei] of vague praise for comprehensive works “is worse than worthless, it was harmful.” If Vierkandt did not improve, Wundt concluded, he would have to be dropped. Wundt would not write the reviews himself, but he recommended others in Leipzig who could: Ottmar Dittrich for language studies and Felix Krueger for sociological and cultural-ethical topics.⁵¹ Having just returned to Leipzig from Kiel, Krueger had begun to work on Wundt’s current research specialty. Wundt continued to give advice on reviews in *Völkerpsychologie*,⁵² as he continued to write his heavy volumes on that topic.

b. Disagreement on the constitution of the “entire field of psychology.”

Nearly every time Wundt gave Meumann advice on the *Archiv*, as extensive as it was and as effective as much of it turned out to be, he would add a qualifying phrase to this effect: “Naturally this is only my humble opinion; you must decide for yourself.”⁵³ Meumann, as it turned out, took the dis-

⁴⁷ Wundt to Ernst Meumann, 18 November 1902, UAL, Wundt Nachlass, Nr. 714.

⁴⁸ Wundt to Ernst Meumann, 9 January 1904, UAL, Wundt Nachlass, Nr. 721.

⁴⁹ Wundt to Ernst Meumann, 23 October 1902, UAL, Wundt Nachlass, Nr. 713.

⁵⁰ Wundt to Ernst Meumann, 18 November 1902, UAL, Wundt Nachlass, Nr. 714.

⁵¹ Wundt to Ernst Meumann, 11 June 1903, UAL, Wundt Nachlass, Nr. 717.

⁵² Wundt to Ernst Meumann, 2 August 1903, UAL, Wundt Nachlass, Nr. 718.

⁵³ For example: Wundt to Ernst Meumann, 18 November 1902, UAL, Wundt Nachlass, Nr. 714.

claimers more literally than Wundt hoped he would.

Starting with his arrival in Zürich, Meumann had been involved with pedagogy to an extent that bothered Wundt: Wundt wanted him to gain prominence as a philosopher, as well as an experimental psychologist. As Meumann worked for promotion from Extraordinarius to Ordinarius, Wundt advised him against writing polemical articles against Neo-Kantians; instead he should produce "something on English aesthetics or a similar short piece" right away, followed by an "outline of psychological pedagogy" [Grundriss der psychologischen Pädagogik] within the following year.

First a brochure, then a book, then laboratory work, etc.; and leave the Neo-Kantians alone for now! Scholasticism is simply going to go on existing in this world, and I know you will not extinguish it, as little as I care for it myself.

[Also zuerst eine Broschüre und ein Buch—dann Laboratoriumsarbeit u.s.w., und die Neukantianer lassen Sie vorläufig ganz in Ruhe! Scholastik muss es nun einmal in der Welt geben, und Sie werden sie nicht wegschaffen, so wenig ich es vermag.]⁵⁴

Wundt repeatedly encouraged him to publish an *independent, non-psychological* work [selbständige, nichtpsychologische Arbeit].⁵⁵

Meumann was determined to distinguish himself in the lowly area of pedagogy, rather than in a more dignified philosophical field. Wundt tried to tolerate his interest:

It is probably time that some method is brought into the somewhat irregular activities of pedagogical psychologists, especially of those well-intentioned, though often ill-advised schoolmasters.

[Es ist wahrlich Zeit, dass in das etwas ungerregelte Treiben der pädagogischen Psychologen, besonders der wohlmeinenden, aber manchmal übelberathenen Schulmeister etwas Methode kommt.]⁵⁶

In a sense, Meumann proclaimed his independence from Wundt by marking off a plot outside of Wundt's territory and endeavoring to make it a major part of "the entire field of psychology."

In 1902 Wundt finally received Meumann's first writing on pedagogy.⁵⁷ His reaction was grudging approval:

I read your article on experimental pedagogy with great interest; and I must confess, you have even turned me partially from the skepticism that I have gradually acquired after so

⁵⁴ Wundt to Ernst Meumann, 19 July 1899, UAL, Wundt Nachlass, Nr. 704.

⁵⁵ Wundt to Ernst Meumann, 29 October 1899, UAL, Wundt Nachlass, Nr. 705.

⁵⁶ Wundt to Ernst Meumann, 16 December 1900, UAL, Wundt Nachlass, Nr. 709.

⁵⁷ Ernst Meumann, "Entstehung und Ziele der experimentellen Pädagogik," *Deutsche Schule*. 5 (1901).

many unsystematic 'school experiments.'

[Ihre Abhandlung über experimentelle Pädagogik habe ich mit vielem Interesse gelesen, und ich muss gestehen, Sie haben mich sogar theilweise von dem Skeptizismus bekehrt, den ich in folge so mancher planloser 'Schulversuche,' allmählich mir angeeignet hatte.]

The schoolmasters, Wundt observed, were typically very unscientific: they would investigate one factor (e.g. room ventilation) without taking other, more important variables into account (street noise, fatigue, time since meals). Wundt regretted that Meumann had not published the essay separately, since the journal in which it appeared was little known outside pedagogical circles.⁵⁸ Within those circles and among psychologists who were interested in child development and education, Meumann developed his following.

The first issues of *Archiv für die gesamte Psychologie* made the chief editor's interest in pedagogy very evident. Wundt remarked that they made "a really good, truly scientific impression--if only the schoolmasters would take care to be briefer!" [...einen recht guten, echt wissenschaftlichen Eindruck. Wenn sich nur die Schulmeister einer etwas grösseren Kürze befeissigen wollten!] One author, Wundt complained, wasted 150 pages on biographies of pupils, etc., just to prove something that any reasonable person knew beforehand.⁵⁹ A year later Wundt sent Meumann a bombshell of a letter--he had decided to start a new journal and to cease publishing in Meumann's *Archiv*.

Wundt had determined that Meumann's conception of "the entire field of psychology" emphasized pedagogy altogether too much. In the issues that had appeared by late 1904, Wundt counted 873 pages on pedagogy, compared to 715 for all other fields of psychology combined. Meumann clearly had an "inner necessity" [innere Notwendigkeit] to give pedagogy such emphasis. Wundt acknowledged that an editor had the prerogative to emphasize such material as he saw fit. He also admitted that Meumann's view of psychology was probably closer to current fashion. [Denn die Pädagogik ist ja gegenwärtig Mode.] He suggested Meumann might take advantage of this trend: he could rename the journal "Archiv für Pädagogik und Psychologie" and increase sales to schoolteachers.⁶⁰ A week later Wundt took back this suggestion: it would be best for Meumann to keep the journal

⁵⁸ Wundt to Ernst Meumann, 3 May 1902, UAL, Wundt Nachlass, Nr. 711.

⁵⁹ Wundt to Ernst Meumann, 3 June 1903, UAL, Wundt Nachlass, Nr. 716a.

⁶⁰ Wundt to Ernst Meumann, 13 December 1904, UAL, Wundt Nachlass, Nr. 722.

under the current name. Wundt also disapproved of Meumann starting a separate journal for pedagogy: it would be unwise to edit two journals simultaneously.

Wundt explained that his new journal would not compete with Meumann's—it would publish only work from the Leipzig Institute "...in unified and concentrated form..., because *our* tendencies here are other than those predominately practical ones" [ein einer einheitlichen und konzentrierten Form..., weil *unsere* Tendenzen hier andere sind als jene vorwiegend praktischen.]⁶¹ Institute Assistants Krueger and Wirth, moreover, would continue to contribute reviews to the *Archiv*, and Wundt himself would continue to participate, "though not actively."⁶² Wundt's new journal, *Psychologische Studien*, first appeared in 1905, the year Wundt turned seventy-three.

Wundt decided to start another journal, as he explained to Külpe, not only to avoid clashes with Meumann, but also to satisfy those needs of the Leipzig Institute that Meumann's journal seemed disinclined to fulfill:

...partly to facilitate rapid appearance of research from the Leipzig Institute, and partly to concentrate and bring into a unified expression those works which depart considerably from the general tendency to practical application.

[...teils um ein rasches Erscheinen der Arbeiten des hiesigen Instituts zu ermöglichen, teils um diese, im ganzen doch von der erwähnten Tendenz nach praktischer Anwendung wesentlich abweichenden Arbeiten zu konzentrieren und einheitlich zum Ausdruck zu bringen].

The Leipzig Institute would continue to support the all-important review section of the *Archiv*. Wundt asked Külpe, who was expecting a visit from Meumann, to urge special attention to the reviews, and particularly to upgrade the quality of those in *Völkerpsychologie*.⁶³

Wundt still intended for the *Archiv* to represent "the entire field of psychology," as the *Psychologische Studien* presumably would not do. Meumann made Wilhelm Wirth second editor [Mitredakteur] of the *Archiv*, with editorial control of the area of sensory psychology.⁶⁴ Wundt advised Meumann not to eliminate articles on pedagogical studies, but to shorten them. "Since the *Archiv* is to be the *general* journal which serves *all* interests, it certainly cannot ignore the dominant interests of the public." [Da

⁶¹ Wundt to Ernst Meumann, 20 December 1904, UAL, Wundt Nachlass, Nr. 723.

⁶² Wundt to Ernst Meumann, 13 December 1904, UAL, Wundt Nachlass, Nr. 722.

⁶³ Wundt to Oswald Külpe, 25 December 1904, UAL, Wundt Nachlass, Nr. 407.

⁶⁴ Wundt to Friedrich Kiesow, 16 July 1905, UAL, Wundt Nachlass, Nr. 224.

das Archiv doch eine *allgemeine, alle Interessen dienende Zeitschrift* sein soll und am allerwenigsten daher die in der Öffentlichkeit vorherrschenden ignorieren kann...⁶⁵ Even after Wundt began his own journal, the Leipzig Institute continued to depend on the *Archiv*, and vice versa.

Although they had both had minor disagreements with their teacher, Külpe and Meumann were the most successful of Leipzig's first generation of psychologists. In 1905 Wundt still considered them to be his primary intellectual heirs. The trouble was that both men still worked in universities that counted as minor centers for philosophical studies, Külpe in Würzburg and Meumann in Zürich.

2. Difficult progress in the careers of Külpe and Meumann.⁶⁶

a. Külpe remains in Würzburg in spite of Prussian nibbles, 1904-09.

Külpe managed to survive his initial problems with Bavarian ultramontanes and even to get a little official support for the Würzburg laboratory. In 1904, a decade after he left Leipzig, he had a nomination by the faculty at Münster, a former Catholic theological academy that Prussia had elevated to university status only two years earlier. Külpe was very pleased at the prospect of the move.

Wundt's academic radar, however, warned of dangers. He wanted Külpe to realize that leaving would jeopardize the continuation of experimental psychology in Würzburg. Support for a new laboratory in Münster, moreover, was by no means guaranteed by the preliminary, oral assurances [*vorläufig, mündlich gegebenen Zusicherungen*] of Secretary Althoff. Wundt urged Külpe to use the *Berufung* to improve his situation in Würzburg.⁶⁷

Külpe essentially followed Wundt's advice and found out that Althoff was not prepared to support an institute. Commending Külpe for his hard bargaining, Wundt suggested that the negotiations were only intended to humor the Münster faculty's interest in attaining an experimental psychologist [*um einer vor der Fakultät zu Münster zu spielenden Komödie willen*]. The swift hiring of Ludwig Busse (Ordinarius in Königsberg, another Prussian university) indicated that Althoff had predetermined the outcome anyway [*von vornherein eine abgekartete Sache*].

⁶⁵ Wundt to Ernst Meumann, 7 January 1905, UAL, Wundt Nachlass, Nr. 724.

⁶⁶ Appendices II and III are useful references for this section.

⁶⁷ Wundt to Oswald Külpe, 18 June 1904, UAL, Wundt Nachlass, Nr. 403.

Wundt expressed regret that the Münster position had not been offered to Meumann, who wanted so much to leave Zürich. Althoff did not make such an offer, Wundt told Külpe, because he knew Meumann would definitely accept it, even under the poor circumstances. By calling Busse, Althoff kept experimental psychologists out of Münster and avoided their lobbying for institute support. So ran Wundt's interpretation of this and of many other developments in Prussian professorships of philosophy: the faculty was willing, but the ministry was weak on support.

Trying to console Külpe, Wundt compared Bavarian and Prussian administration of higher education. The Bavarian ministry, he observed, was decent, considering the pressures from ultramontanes in the State government. Educational affairs in Berlin, on the other hand, were run by a "Pasche-Regime," with many professors actually encouraging Althoff in his dictatorial ways. "The old saying--that every people gets the government it deserves--also applies to university professors." [Das Wort, dass jedes Volk die Regierung hat, die es verdient, gilt auch von dem Volk der Universitätsprofessoren.]⁶⁸

Soon more opportunities came Külpe's way. He gave some lectures at the Frankfurt Akademie für Sozial- und Handelswissenschaften, a former commercial academy that had in 1902 come under Prussian educational administration, and even considered taking a permanent position there. To Wundt's relief, Külpe did not succumb to the "Frankfurt enticement" and remained "true to the university" [trotz der Frankfurter Verlockung der Universität treu geblieben].⁶⁹ Külpe's junior colleague, Karl Marbe, became professor at the Frankfurt Academy and started its program in experimental psychology. Conveying congratulations to Marbe, Wundt could not resist criticizing his work: "If he only he were not just a fine lecturer but also a less scholastic psychologist. I do not know what to make of his 'experiments on judgment' and such things." [Wenn er nur nicht bloss ein trefflicher Dozent, sondern auch ein minder scholastischer Psychologe wäre! Mit seinen 'Urteilsexperimente' und ähnliches vermag ich garnichts anfangen.]⁷⁰

⁶⁸ Wundt to Oswald Külpe, 10 July 1904, UAL, Wundt Nachlass, Nr. 404.

⁶⁹ Wundt to Oswald Külpe, 25 December 1904, UAL, Wundt Nachlass, Nr. 405.

⁷⁰ Wundt to Oswald Külpe, 5 December 1905, UAL, Wundt Nachlass, Nr. 409.

Wundt believed that the experimental psychologist was in the best position to contribute to his science as a professor of philosophy in the university. Since his opinion of Marbe as a psychologist was not very high, losing him to Frankfurt was not so serious. It fit Wundt's picture of non-university psychologists that Marbe began in Frankfurt to apply psychology to advertising, law, and other practical matters.⁷¹ For Wundt, the business of the university professor was theoretical science, not practical applications.

In 1905, shortly after the Frankfurt position was filled, Alois Riehl was called to Berlin. With advice from Wundt, Riehl had maintained a small psychological laboratory in Halle, as had Erdmann and Stumpf before him.⁷² Ebbinghaus moved to Riehl's chair in Halle, and the Breslau faculty nominated Külpe to replace Ebbinghaus.⁷³ Wundt congratulated Külpe but repeated his earlier advice. Sources in Breslau reported that support for experimental psychology would not be greater than that given to Ebbinghaus. Unless Külpe were prepared to do without the kind of resources he had at Würzburg, he once again faced hard bargaining with Althoff.⁷⁴

This time Külpe agreed to accept the call without firm assurances for an institute. Although disappointed, Wundt understood Külpe's eagerness to leave Würzburg for a larger university. However, he had one more note of caution: it was still possible that Althoff had someone else in mind.⁷⁵

As action on the Breslau position was delayed, Wundt warned that Berlin was harboring secrets.⁷⁶ While Wundt was spending Easter vacation at his Heidelberg home, Institute Assistant Wirth wrote of Ebbinghaus's courtesy call in Leipzig. Not only would there be no more support for experimental work in Halle than Riehl had had, but the Breslau chair would go to a non-psychologist. Ebbinghaus told Wirth that the Prussian administration simply was not supportive of psychology. [Überhaupt sei die preussische Regierung nicht sehr für die Psychologie.]⁷⁷

⁷¹ "Karl Marbe," in *A history of experimental psychology in autobiography*, vol. 3 (Worcester, MA: Clark U. Press, 1936), 181-213: 202.

⁷² Alois Riehl to Wundt, 26 February 1913, UAL, Wundt Nachlass, Nr. 1391.

⁷³ Oswald Külpe to Wundt, 29 September 1905, UAL, Wundt Nachlass, Nr. 406.

⁷⁴ Wundt to Oswald Külpe, 1 October 1905, UAL, Wundt Nachlass, Nr. 407.

⁷⁵ Wundt to Oswald Külpe, 21 October 1905, UAL, Wundt Nachlass, Nr. 408.

⁷⁶ Wundt to Oswald Külpe, 1 January 1906, UAL, Wundt Nachlass, Nr. 410.

⁷⁷ Wilhelm Wirth to Wundt, 11 April 1906, UAL, Wundt Nachlass, Nr. 946.

The new professor of philosophy in Breslau was Eugen Kühnemann, Althoff's best friend, according to *Neue Deutsche Biographie*. Breslau no longer had an experimental psychologist as Ordinarius. Privatdozent William Stern took charge of the psychological seminar there and was promoted to Extraordinarius in 1907.

Külpe remained in Würzburg, more contented than defeated. The *Berufungen* at least resulted in a regular institute budget of 500 marks and a salary for an assistant. In 1906 the private gift of the "Leopold Schwelsch Stiftung" started bringing in 2000 marks annually and giving Külpe and his students material support for their work. With his companions--two maiden cousins--Külpe took a larger apartment near his institute. He remarked to Wundt, "Moving is such an unpleasant, real event that it makes one wish he were a subjective idealist." [Der Umzug selbst ist ein so unangenehmes reales Ereignis, dass man daraufhin subjektiver Idealist werden möchte.]⁷⁸ He would not raise his hopes of leaving, even when he was again first choice of the faculty to succeed Ebbinghaus, who died suddenly in Halle: "This will probably have just as Platonic a meaning as the earlier Prussian nominations." [Das wird wahrscheinlich ebenso platonische Bedeutung haben, wie frühere Vorschläge in Preussen.]⁷⁹

Külpe was right. He was not called to Halle. Ernst Meumann got the position, most likely because he was already a professor in Prussia. Meumann's movements illustrate the politics of Prussian chairs of philosophy and his efforts to promote experimental psychology in that environment.

b. Meumann escapes Zürich to the vagaries of Prussian academe: the "traveling professor."

Shortly after his arrival in Zürich in 1897, Ernst Meumann managed to purge the "Avenarius fanatics," establish his institute, and make the university a center for experimental psychology. His laboratory assistant, Arthur Wreschner, aided these efforts, and in 1902 Gustav Störing, Meumann's good friend, was called from Wundt's Institute to assume the second professorship of philosophy in Zürich.

Although Meumann had hoped that his stay in Switzerland would be brief, it lasted eight years. Finally he got the chance to advance his career, and Wundt's Institute naturally took an interest in the

⁷⁸ Oswald Külpe to Wundt, 12 Juli 1907, UAL, Wundt Nachlass, Nr. 413.

⁷⁹ Oswald Külpe to Wundt, 27 March 1909, UAL, Wundt Nachlass, Nr. 418.

development.

In the summer of 1905, Hugo Münsterberg, self-styled international ambassador for psychology, visited Leipzig during his tour through Germany. He brought with him the rumor that Meumann would be called to Königsberg to replace Busse, who had assumed the Münster position that Külpe had wanted. To Wundt's irritation, Münsterberg also led Wilhelm Wirth to believe he had a chance to succeed Meumann in Zürich. Even though Wundt tried to convince Wirth not to trust Münsterberg's information, Wirth sent Meumann some of his papers and asked that they be given to the dean of the Philosophical Faculty.

Wundt was skeptical about the Königsberg *Berufung*. Referring to Külpe's Münster debacle, he wrote Meumann a letter explaining that an experimental psychologist had to overcome a formidable obstacle before attaining a professorship in Prussia.

I have the impression that Althoff simply does not want any experimental psychologist who will, as he fears, bring an institute with him. And I suspect that this view of his is powerfully supported by the Berlin philosophers [Zeller, Dilthey, Stumpf]. So simply do not take anything as certain, and just assume that he has said to the Königsberger who nominated you, 'we cannot establish a psychological institute in Königsberg.' That is essentially what he said to Külpe.... It will make me very happy if I am too pessimistic [zu schwarz sehe]. Hopefully you will not be held in suspense very much longer.

[Ich habe den Eindruck, dass Althoff einen experimentellen Psychologen, der, wie er fürchtet, ein Institut nach sich zieht, überhaupt nicht will--eine Ansicht, bei der ihn, wie ich vermute, die Berliner Philosophen kräftig unterstützen. Nehmen Sie also ja nichts als gewiss an, und hüten Sie sich, dass er den Königsbergern, die Sie vorschlagen haben, sagt: 'ein psychologisches Institut können wir in Königsberg nicht gründen,'--dasselbe, was er Külpe gesagt hat.... Es soll mich freuen, wenn ich zu schwarz sehe. Hoffentlich werden Sie nicht allzu lang in dieser Schwebelage gehalten.]⁸⁰

The very next day, Meumann read Wundt's letter and wrote back immediately. (Such efficient postal service even crossed international borders.) The *Berufung* to Königsberg had just arrived, complete with the Kaiser's signature. Meumann described his cautious negotiations during the preceding two weeks. In response to the ministry's promise of a psychological institute and philosophical seminar, Meumann had tried to make his intentions appear modest. He had emphasized the use of apparatus for lecture demonstrations, as well as for research, and he noted that he already possessed most of what he needed.

⁸⁰ Wundt to Ernst Meumann, 13 July 1905, UAL, Wundt Nachlass, Nr. 725.

Meumann waxed optimistic about his possibilities in Prussia. He thought he would eventually get an institute, in spite of his soft sell to the ministry:

I have come to the conclusion that Althoff and Elster are personally not at all averse to our psychological direction and that Külpe's problem earlier was that he, so to speak, fell into the house with the door. In particular, my colleague Külpe did not take into account that it was the question of Münster--Althoff was somewhat peeved that Külpe wanted so much for a place which is not even a "full" university, things for which Göttingen [G.E. Müller], Breslau [Ebbinghaus], and others have so long lobbied in vain.

[Ich habe den Eindruck gewonnen, dass Althoff und Elster persönlich unsere psych. Richtung durchaus nicht abgeneigt sind und dass Külpe seinerzeit etwas zu sehr mit der Tür ins Haus gefallen ist. Vor allem hatte Kollege Külpe wohl nicht beachtet, dass es sich um Münster handelte, und da ist Althoff etwas ärgerlich geworden, dass für diese nicht einmal ganz "volle" Universität so hohe Forderungen in einer Angelegenheit gestellt wurden, um die sich Göttingen u. Breslau u. a. so lange vergebens bemüht haben.]⁸¹

Meumann promised Wundt he would make Königsberg "a mighty fortress for experimental psychology" [ein fester Burg der exp. Psychologie], even though the professorship was designated for "philosophy and history of philosophy." He hoped to please Wundt better in Königsberg than he had been able to do so far. Finally, he assured Wundt that he would not pass along Wirth's embarrassing materials in Zürich.

Before he departed for Königsberg, Meumann wrote a letter to Wundt's wife, Sophie, giving interesting personal reasons why he was so happy to leave Zürich. His work suffered because the teaching load was so heavy (ten to twelve hours per week) and because the students were so bad, "particularly the women." It is peculiar that he mentioned this to Mrs. Wundt. If she was opposed to women studying in universities, Wundt himself was not.⁸² Worst of all, Meumann continued, were the Russian Jewesses, who often comprised a third of the philosophical seminar and were "demanding to the point of impudence" [anspruchsvoll bis zur Frechheit].⁸³ Meumann therefore looked forward to teaching German students, who were almost all male and were more monocultural than those in Zürich. He even tried to find an advantage to Königsberg's cold climate: at least he would escape the variation of

⁸¹ Ernst Meumann to Wundt, 14 July 1905, UAL, Wundt Nachlass, Nr. 726.

⁸² Wundt, "Gutachten über das Frauenstudium," in Arthur Kirchhoff, ed., *Die akademische Frau, Gutachten von Universitätsprofessoren, Frauenlehrer und Schriftsteller über die Befähigung der Frau zum wissenschaftlichen Studium* (Berlin: Steinitz, 1897), 179-181.

⁸³ The university historians wrote of the "Russian question of 1900-1905," which involved a surge in the number of Russian students, in particular women studying medicine. The most famous "Russian Jewess" to be educated in Zürich was actually a Polish student of political science, Rosa Luxemburg, who left Zürich about the time Meumann arrived. Ernst Gagliardi, Hans Nabholz, and Jean Strohl, eds., *Die Universität Zürich 1833-1933 und ihre Vorläufer, Festschrift zur Jahrhundertfeier* (Zürich: Verlag der Erziehungsdirektion, 1938), 640, 780-783, 832.

temperature and the fogs that made Zürich winters so uncomfortable, "especially for the class of bookworms, which of course we professors are" [besonders für das Geschlecht der Stubenhocker, das wir Gelehrten nun einmal sind]. This letter bears witness not only to Meumann's prejudices, but also to the delicate constitution of his nerves and his health.

Meumann informed Mrs. Wundt of the complexities surrounding the choice of his successor in Zürich. Störriing wanted to nominate Stephan Witasek (Privatdozent, Graz), but Meumann disliked his philosophical views. (Wundt also was very critical of Meinong and the Graz philosophers.) Meumann's assistant, Wreschner, was "a successful lecturer but was lacking in major respects." Meumann thought Felix Krueger in Leipzig was an acceptable candidate but that Wilhelm Wirth was "too much a Lippsonian." (This is curious; Wundt thought he was too much a psychophysicist.) The educational ministry in Zürich was likely to favor a Swiss, though already several Germans had been recommended: Theodor Eisenhans (Privatdozent, Heidelberg), Jonas Cohn (Extraordinarius, Freiburg), Hermann Schwarz (Privatdozent, Halle), and Friedrich Schumann (Privatdozent and Stumpf's assistant, Berlin). Meumann promised to inform Wundt of further developments.⁸⁴

Those developments came quickly. Friedrich Schumann was made professor in Zürich, to nearly everyone's surprise and to Wundt's extreme displeasure. Meumann reported that the matter had gone entirely against his intentions. He had recommended leaving the chair unoccupied for a semester and sending a delegation to hear Schumann lecture in Berlin and G.F. Lipps in Leipzig. That procedure, Meumann expected, would have led to the choice of Lipps, who by this time had replaced Krueger as the candidate from Leipzig. Meumann's plan, however, was wrecked by a vigorous protest from Störriing: he did not want to direct the laboratory even for one semester, nor would he let Wreschner fill in for Meumann. The ministry called Schumann, under pressure from the remaining Ordinarius in philosophy simply to hire someone right away.⁸⁵

To Wundt, Schumann was "just about the worst possible choice for Zürich" [ziemlich die schlechteste Wahl, die in Zürich getroffen werden könnte]. According to Meumann, Störriing was not

⁸⁴ Ernst Meumann to Sophie Mau Wundt, 14 August 1905, UAL, Wundt Nachlass, Nr. 728.

⁸⁵ Ernst Meumann to Wundt, 14 October 1905, UAL, Wundt Nachlass, Nr. 729.

even acquainted with Schumann's work; he had simply followed Stumpf's recommendation.⁸⁶ The episode lowered Störing in Wundt's estimation, and he strongly disagreed with Külpe's positive evaluation of Schumann:

I consider him to be a mere technician in psychology, totally without ideas, so I cannot subscribe to your favorable judgment. I expect that they were glad to have him out of the way in Breslau.

[Ich halte ihn auch in der Psychologie für einen reinen ideallosen Techniker und kann daher Ihr günstiges Urteil nicht unterschreiben. Ich vermute, dass die Breslauer froh waren, ihn los zu werden.]⁸⁷

At that time Külpe was still hoping to replace Ebbinghaus in Breslau, so the elimination of Stumpf's assistant from the competition was a good sign. In the end, however, no experimentalist got the Breslau position.

It is useful at this point to summarize the developments of 1905. (Refer to Appendix II.) Riehl went to Berlin and was replaced in Halle by Ebbinghaus, a strong experimental psychologist who nevertheless received little funding for his work. Ebbinghaus's Breslau professorship went to a crony of Secretary Althoff's, a non-psychologist. Marbe left Külpe's side to go to the Frankfurt Academy and begin an institute for psychology; Meumann went to Königsberg to try to do the same. Külpe, after considering Frankfurt and declaring himself willing to sacrifice his institute for Breslau, stayed in Würzburg. With the cooperation of Störing, Schumann left Stumpf's side in Berlin to replace Meumann in Zürich. For Wundt, Meumann's move was the only bright spot in the entire picture, a picture made dimmer by meager Prussian support for university institutes for psychology.

Meumann taught at Königsberg for only three semesters, but he managed to begin a laboratory with his own apparatus. He also saw fit to disregard Wundt's advice not to edit a second journal; in 1905 he became editor of *Zeitschrift für experimentelle Pädagogik*.

When Meumann departed Königsberg to succeed Busse in Münster, Wundt advised him on nominations for his replacement. Wundt predicted that the older psychologists would not accept calls: Gerardus Heymans would not leave Groningen, nor Götz Martius leave Kiel, for Königsberg. Wundt

⁸⁶ Wundt to Oswald Külpe, 1 October 1905, UAL, Wundt Nachlass, Nr. 407.

⁸⁷ Wundt to Oswald Külpe, 21 October 1905, UAL, Wundt Nachlass, Nr. 408.

disapproved of nominating Störing: he would not represent philosophy in the way Meumann did, and it was bad for the faculty and for science to recommend someone purely on the basis of friendship. Besides, Störing had already damaged psychology in Zürich by bringing Schumann there. Wundt suggested nominating Alfred Lehmann of Copenhagen or Narziss Ach, Stumpf's assistant in Berlin--"he is in any case much more capable than his predecessor," i.e., Schumann. Noting that a good Privatdozent was better than a bad Ordinarius, Wundt also recommended other young scholars: Anathon Aall (Privatdozent, Halle, and frequent visitor to Wundt's Institute) and Theodor Elsenhans (Privatdozent, Heidelberg). Although neither had yet published original work in the area, both taught psychology from an experimental standpoint [lehren Psychologie vom experimentellen Standpunkt aus] and were capable lecturers of philosophy [tüchtige Dozenten der Philosophie].⁸⁸ Narziss Ach became professor at Königsberg, so this time Wundt was satisfied with the outcome. Meumann had replaced himself with another experimental psychologist.

In the small university at Münster, Meumann led a quiet and productive life. He edited his two journals and published some longer works of his own. He got a grant of 1000 marks to support his laboratory, but found the ministry generally had little interest in Münster [...man scheint für Münster nicht viel übrig zu haben]. Even though Secretary Althoff died in 1908, his policies continued under his successor, Ludwig Elster (1856-1935). The optimism of 1905 had vanished, however, and Meumann now believed he was paying for having come to Prussia against Althoff's wishes. [Althoff verzieh es mir nicht, dass ich seinerzeit gegen seinen Wunsch gekommen bin.]⁸⁹

Meumann remained in Münster for five semesters. When Ebbinghaus died in Halle, and Külpe was first choice of the faculty, Meumann was second on the list. Wundt told him to expect the call: "In Prussia they do not use the system of calls, but rather of transfers." [In Preussen herrscht aber bekanntlich das System der Versetzungen, nicht der Berufungen.]⁹⁰ And so Meumann was "transferred" from Münster to Halle. After only two semesters there, Wundt had him called to Leipzig, in 1910.

⁸⁸ Wundt to Ernst Meumann, 29 January 1907, UAL, Wundt Nachlass, Nr. 732.

⁸⁹ Ernst Meumann to Wundt, 2 August 1908, UAL, Wundt Nachlass, Nr. 737.

⁹⁰ Wundt to Ernst Meumann, 9 April 1909, UAL, Wundt Nachlass, Nr. 739.

All in all, Meumann taught at three Prussian universities during only twelve semesters. As Wundt remarked to Külpe on the occasion of the Münster *Berufung*, Meumann was a "virtual traveling professor" [wirklichen Reiseprofessor].⁹¹ In the course of these travels, he introduced experimental psychology in Königsberg and Münster. Although he did not remain long enough to establish his own research tradition, his successors were all experimentalists: Ach in Königsberg, Erich Becher (a student of Benno Erdmann) in Münster, and Felix Krueger in Halle. As Meumann made institutional progress for experimental psychology in Prussia, Külpe stirred up theoretical issues in Würzburg.

3. Wundt's criticism of "Würzburg thought experiments," 1907-08.

After he left Leipzig, Külpe's philosophical viewpoint gradually changed from tough-minded Machian phenomenism, seeking a common basis for physical and psychic experience, to what he called "realism." According to one of his American students, Külpe recognized this shift in attitude during the summer of 1898.⁹² Like Stumpf, and in contrast to Wundt, Külpe tended to keep an open mind toward the theoretical views of his younger colleagues.

To Külpe, Wundt's system of psychology was based on an idealistic conception of will (which troubled him already in his Machian period in Leipzig) and rigid assumptions about psychic elements (which Külpe was inclined to relax in the Würzburg laboratory). Although Wundt freely admitted that his metaphysics of "actuality" was in line with the German idealistic tradition, he insisted that experimental psychology confirmed his elementary analyses.

Wundt's basic psychic elements were sense perceptions [Empfindungen] and simple feelings [Gefühle]. Sense perceptions began in the periphery; feelings originated centrally, although they could be evoked by sensations. If those elements were the appropriate ones, then any distinct mental process, any volitional process, could be analyzed into those terms.

Wundt had long referred to sense perceptions as psychic elements, and he had concentrated the work of the early Institute on this class of phenomena. In experiments on reactions to sense percep-

⁹¹ Wundt to Oswald Külpe, 31 December 1906, UAL, Wundt Nachlass, Nr. 411.

⁹² Robert M. Ogden, "Oswald Külpe and the Würzburg School," *American journal of psychology*, 64 (1951), 4-19: 13.

tions, it was found to be impossible to measure separate times for acts of recognition, discrimination, or choice by means of the subtraction method. Wundt therefore called off the effort to analyze volition into these separate actions and appropriated the general term, apperception, to characterize all mental action upon sense perceptions.

Wundt's discussions of feelings were somewhat vague during these early years. Later, experiments on bodily correlates of emotions (high-intensity feelings) led him to believe that observable changes in things like pulse, blood pressure, and respiration rate could indirectly represent distinct volitional acts involving feelings [Gemütsbewegungen]. Wundt formulated his tri-dimensional theory of feelings to account for the variations in intensity and rapidity observed in bodily correlates of emotions: he distinguished volitional modes of pleasure-displeasure, excitement-composure, and tension-relaxation. The first systematic presentation of this theory of feelings appeared in Wundt's general text in 1896,⁹³ and from that time on, research on bodily correlates of feelings represented a substantial proportion of the work in the Leipzig Institute.

Külpe was no longer in Leipzig when Wundt formulated his tri-dimensional theory of feelings, and he never accepted it nor its association with Wundt's theory of will. Külpe's critique of the subtraction method, which implied an impenetrable wholeness of a reaction, may have led to his dissatisfaction with Wundt's method of analyzing psychic experience into elements.

For more than a decade Külpe published nothing that questioned Wundt's analytical framework directly: his writings concerned philosophical realism, aesthetics and history of philosophy. In the Würzburg laboratory, however, he was voicing his criticism of Wundt's approach to psychology.

Shortly after 1900, Külpe's students began to publish work that challenged fundamental Wundtian premises. By 1907 there was a fairly well-defined "Würzburg School," identified with research on thought processes. Partly because E.B. Titchener's early critical review of these studies⁹⁴ used the term, American psychologists refer to the school's key conceptual contribution as "imageless thought," thought which is not reducible to sensory perceptions or feelings. Although Titchener staunchly

⁹³ Wundt, *Grundriss der Psychologie* (Leipzig: Engelmann, 1896), 33-105.

⁹⁴ Edward B. Titchener, *Lectures on the experimental psychology of thought processes* (NY: MacMillan, 1909).

defended elementism, the Americans have interpreted the Würzburg experiments as an encouragement to experimental psychologists to challenge Wundt's elementism and his prohibition of experiments on "higher mental functions."⁹⁵ This characterization is apt, but it fails to include Wundt's reason for the "prohibition."

The Würzburg studies of thought began to appear in 1901.⁹⁶ They all had two things in common: the use of purely subjective reports as the primary data and the identification of a "psychic element" that did not reduce to Wundtian sense perception or feeling.

As an example of the direct subjective reporting, Marbe's experiments presented reactants with situations to judge (yes-no, heavier-lighter, darker-lighter, higher-lower, etc.). Marbe asked for the answer and for a report [Aussage] on how the judgment was attained.⁹⁷ Research in Wundt's laboratory also made use of subjective reports, but these were always coordinated to (or as Wundt liked to say, controlled by) more objectively acquired data, usually measurements of time or intensity. The subjective reports served to confirm or raise questions about interpretations of the data, or to indicate how to expand an investigation.⁹⁸ In the Würzburg thought experiments, on the other hand, the reports themselves were the data to be analyzed—or better, to be systematized and described.

The Würzburg investigations identified psychic entities that would not reduce to Wundtian elements. Marbe, for example, found that some judgments occur very quickly, without enough time for an analysis of the psychic elements, which, according to Wundt, always precedes a judgment. These judgments resulted from *Bewusstseinslagen*, "conscious attitudes," which could not be analyzed into sense perceptions or feelings. Closer to the heart of the matter, Marbe also noted that tension and relaxation were "conscious attitudes," not "feelings." In other words, Marbe rejected Wundt's tri-dimensional theory of feelings. It was about this study that Wundt complained to Külpe, as Marbe left for Frankfurt

⁹⁵ Boring, 401-410. Gardner Murphy, *Historical introduction to modern psychology*, 2nd ed. (NY: Harcourt, Brace, 1950), 225-233.

⁹⁶ The first was August Mayer and Johannes Orth, "Zur qualitativen Untersuchungen der Associationen," *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*, 26 (1901), 1-13.

⁹⁷ Karl Marbe, *Experimentell-psychologische Untersuchungen über das Urteil, eine Einleitung in die Logik* (Leipzig: Engelmann, 1901).

⁹⁸ Two good examples appear in the same volume of Wundt's journal: Götz Martius, "Ueber die muskuläre Reaction und die Aufmerksamkeit," *Philosophische Studien*, 6 (1891), 167-216; Georg Dwelshauvers, "Untersuchungen zur Methodik der activen Aufmerksamkeit," *ibid.*, 217-249.

in 1905.

With Marbe gone, Külpe engaged others in experiments on thought processes, generally using the same method of subjective reporting. Where Marbe had found *Bewusstseinslage*, "conscious attitude," Watt and Messer found *Aufgabe*, "potentiality of consciousness,"⁹⁹ Ach found *Bewusstheit*, "awareness,"¹⁰⁰ and Bühler found simply *Gedanke*, "thought." Several years later Külpe published a summary of these studies and expressed his preference for "thought" as the name of the new element and Ach's designation, "systematic experimental introspection" [systematische experimentelle Selbstbeobachtung], for the new methodology.¹⁰¹

It was Bühler's article that finally provoked a response from Wundt. In his experiments, Bühler read a question, or an aphorism or statement preceded by the words, "Do you understand?" The subject answered yes or no, then immediately reported the thought experience. For example:

Can our thought apprehend the nature of thought?--Subject K. 'Yes.' 6 seconds. --The question struck me as strange at first. I thought it must be a trick question. Then Hegel's objection to Kant suddenly occurred to me, and then I said decidedly, yes. The thought of Hegel's objection was fairly full: I knew at that moment precisely what the whole thing was about. There were no words in it, nor any memory images [nichts vorgestellt]; the word 'Hegel' came up only afterwards, in auditory-motor form.

[Können wir mit unserem Denken das Wesen des Denkens erfassen? K. Ja (6"). --Die Frage berührte mich erst komisch; ich dachte, es sei eine Vexierfrage. Dann fiel mir plötzlich ein, was Hegel Kant vorgeworfen, und dann sagte ich mit Entschiedenheit: ja. Der Gedanke an Hegels Vorwurf war ziemlich reich, ich wusste momentan genau, auf was es dabei ankommt, gesprochen hab' ich nichts dabei, auch nichts vorgestellt, nur das Wort Hegel klang mir nachträglich an (akustisch-motorisch).]¹⁰²

Following the experiments on "thoughts" were similar ones on "connections between thoughts" [Gedankenzusammenhänge] and on "memories of thoughts" [Gedankenerinnerungen]. The result of all these experiments was Bühler's typology of thoughts: (1) consciousness of rule [Regelbewusstsein], (2) consciousness of relation [Beziehungsbewusstsein] and (3) intentions [Intentionen]. The last category

⁹⁹ Henry Jackson Watt, "Experimentelle Beiträge zu einer Theorie des Denkens," *Archiv für die gesamte Psychologie*, 4 (1905), 289-436. August Messer, "Experimentell-psychologische Untersuchungen über das Denken," *Archiv für die gesamte Psychologie*, 8 (1906), 1-224.

¹⁰⁰ Narziss Ach, *Ueber die Willenstätigkeit und das Denken. Eine experimentelle Untersuchung mit einem Anhang: Über das Hipp'sche Chronoskop* (Göttingen: Vandenhoeck & Ruprecht, 1905).

¹⁰¹ Oswald Külpe, "Über die Psychologie des Denkens," *Internationale Monatsschrift für Wissenschaft, Kunst, und Technik* (1912); reprinted in Oswald Külpe, *Vorlesungen über Psychologie*, ed. Karl Bühler, 2nd ed. (Leipzig: S. Hirzel, 1922), 297-331. The article originated as an address to the V. Kongress der Deutschen Gesellschaft für experimentelle Psychologie, Berlin, 16 April 1912.

¹⁰² Karl Bühler, "Tatsachen und Probleme zu einer Psychologie der Denkvorgänge," *Archiv für die gesamte Psychologie*, 9 (1907), 297-364; 12 (1908), 1-92; 304-305.

especially betrays the influence of the philosopher Edmund Husserl.

Karl Bühler came to Würzburg after spending a year with Stumpf in the Berlin Psychological Institute. Narziss Ach was assistant during part of that time, and the Berlin Institute was abuzz with Husserl's ideas. With his background in theory of mathematics, Husserl (then at Göttingen) sought to reform philosophy on the foundation of "pure" logic. Such logic did not reduce to psychology. The "psychologism" of late-nineteenth-century philosophers, according to Husserl, failed to recognize the distinction between individual experiences and universal meanings. Psychology--experimental or otherwise--is concerned with psychic elements that are experienced; logic is concerned with meanings that are intended. The elements of psychology are individual and particular; meanings can be universal, and universal logic is the goal of "strict science" [strenge Wissenschaft].¹⁰³

While Husserl criticized psychologism in logic, Bühler applied Husserl's method, phenomenological analysis, to the psychology of thought. Phenomenological analysis, which to Wundt was no real analysis at all, required free presentation of the experiences of consciousness, suspending all "naturalistic" preconceptions--for example, that an experience must be either elementary or complex. Such a methodology could arrive at "elements" which prior assumptions would have excluded. A generation that had been weaned on Mach's critique of the fundamental concepts of physics found an affinity with Husserl's ideas.

As Bühler's study appeared, Wundt was finishing the third (and final) edition of his text on logic, certainly one of the "psychologistic" variety.¹⁰⁴ Eventually Wundt responded directly to Husserl's critique of psychologism and his quest for pure logic. This philosophy was no innovation, in Wundt's estimation, but rather a revival of late-medieval Scholastic logic.¹⁰⁵ In the meantime, Wundt took Bühler and other Würzburg researchers to task for their laboratory methodology.

¹⁰³ The seminal work is Edmund Husserl, *Logische Untersuchungen (Bd. 1. Prolegomena zur reinen Logik. Bd. 2. Untersuchungen zur Phänomenologie und Theorie der Erkenntnis)* (Halle: Niemeyer, 1900-1901). A more succinct formulation of the major ideas appears in Husserl, "Philosophie als strenge Wissenschaft," *Logos. I* (1910/11), 289-341.

¹⁰⁴ Wundt, *Logik. Eine Untersuchung der Principien der Erkenntnis und der Methoden wissenschaftlicher Forschung*, 3rd ed., 3 vols. (Stuttgart: F. Enke, 1906, 1907, 1908).

¹⁰⁵ Wundt, "Psychologismus und Logizismus," in *Kleine Schriften*, vol. 1 (Leipzig: Engelmann, 1910), 511-634.

Wundt offered these methodological criteria for psychological experiments:

- (1) The observer should be in the position to determine the commencement of the event to be observed.
- (2) The observer should be able to pay close attention [im Zustand gespannter Aufmerksamkeit] to the manifestations and follow their course [die Erscheinungen auffassen und ihrem Verlauf verfolgen].
- (3) It should be possible to repeat every observation several times under the same circumstances for the purpose of assuring the results.
- (4) The conditions [Bedingungen] under which a phenomenon occurs should be determined by varying attendant circumstances [begleitenden Umstände]. Once those conditions are determined they should be systematically varied in distinct sets of experiments, so that a condition can either be completely eliminated in separate experiments, or else graduated in its strength or quality.

Wundt classified psychological experiments according to his criteria. "Complete experiments" [vollkommene Experimente] fulfill all four requirements; "incomplete (or imperfect) experiments" [unvollkommene Experimente] fulfill some of them; "false experiments" [Scheinexperimente] fulfill none of the criteria, even though they have the form of experiments.¹⁰⁶

The Leipzig Institute, Wundt explained, endeavored to carry out "complete experiments" whenever possible. This was simple enough for psychophysics, most reaction-time studies, and some work on time-sense, optical illusions, and attention. The criteria were not all so easily fulfilled, however, in studies of association, memory, feelings, and other relatively subjective areas of psychology. In these cases, criteria three and four (controls on the reacting subject) were difficult to maintain, so care was taken to follow criteria one and two—for example, by isolating observers so that they interfere as little as possible with subjects' reactions.

Bühler's investigations, according to Wundt, depended upon "false experiments." By their nature they violated criteria three and four, and they chose to violate the others. Because they involved

¹⁰⁶ Wundt, "Über Ausfrageexperimente und über die Methoden zur Psychologie des Denkens," *Psychologische Studien*, 3 (1907), 301-360; 308-312.

questioning or interrogation [Ausfrage] by an "observer," Wundt called them *Ausfrageexperimente*. There was no proper psychological observer, because the questioner was too intimately involved in the production of the thought process to be able to observe it.

Having rejected Bühler's method, Wundt discussed his own approach to the study of thought processes through the psychology of speech. Although it was perhaps not well known or widely accepted by experimental psychologists, Wundt's idea was not new to him. His book on speech, the first volume of his *Völkerpsychologie*, had already gone into its second edition.¹⁰⁷ He had planned this project in the programmatic introduction to *Beiträge* in 1862, and his collection of *Essays* (1885) included a lecture, "Speech and Thinking," from his first semester at Leipzig, 1875/76.¹⁰⁸

Wundt's response to Bühler made the same point that he had been making since his early career: speech is an objective product of thought processes, but unlike a simple reaction it is not an *individual* product that can be studied by experimentally controlled self-observation [Selbstbeobachtung]. Since it arises in society through historical development, speech and the complicated thought processes it discloses must be approached through a social-historical *Völkerpsychologie*, rather than the *individuell-experimentelle Psychologie*. The psychological experiment is limited to the investigation of simple volitional processes; speech and thought are more complex than this; and Bühler's is not a proper experimental method, anyway. This argument outlines the reasoning behind Wundt's "prohibition" of experiments on "higher thought processes."

Wundt explained why he waited several years to criticize a methodology that had appeared in 1901 in Marbe's monograph.

Experimental psychology is of course still in its infancy, and I do not feel that it is my vocation to track down every youthful sin [Jugendsünde] of which it is therefore guilty.

[Die experimentelle Psychologie steckt begreiflicherweise noch in ihren Kinderschuhen, und ich fühle meinerseits nicht den Beruf in mir, allen Jugendsünde, deren sie sich dabei schuldig macht, nachzuprüfen]¹⁰⁹

¹⁰⁷ Wundt, *Völkerpsychologie. Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythos, und Sitte. Erster Band: Die Sprache*. (Leipzig: Engelmann, 1900). Subsequent editions appeared 1904, 1911/12, 1922.

¹⁰⁸ Wundt, "Die Sprache und das Denken," in *Essays*, 2nd ed. (Leipzig: Engelmann, 1906), 269-317. The essay stood unrevised, and Wundt's reference to the first volume of *Völkerpsychologie* states that the basic idea of the original lecture needed no revision.

¹⁰⁹ Wundt, "Ueber Ausfrageexperimente und über die Methoden zur Psychologie des Denkens," *Psychologische Studien*, 3 (1907), 301-390; 359.

The situation changed, however, when the absolute confidence [unbedingte Selbstvertrauen] of its representatives (especially Bühler) and its terrible simplicity made the *Ausfragemethode* popular.

Only after he published his rejection of the Würzburg method did Wundt discover the extent of Külpe's responsibility for it. Once again Wundt had to admit that he had failed to realize their divergence in viewpoint, this time on experimental methodology.

Until [your letter] I took Marbe to be the intellectual author of this, in my view, entirely useless method, especially since he first attempted to establish it thoroughly in his investigations on judgment, and since Ach as well as more recently Bühler praised this method as a special achievement of Marbe's. It seemed perfectly reasonable to me that this was Marbe's method, for I consider Marbe to be a man who, although he can construct a clever [sinnreiches] instrument, really lacks any and every talent as a psychologist. So I had long accustomed myself to consider his works in that direction as nonexistent. And I could only wonder, each time I caught sight of a paper such as the one on judgment, how someone who had actually practiced natural science could dispense with all scientific methodology.

[Ich habe bis dahin Marbe für den intellektuellen Urheber dieser nach meiner Anschauung völlig verwerflichen Methode gehalten, um so mehr, da er in seinen Urteilsversuchen dieselbe zuerst eingehend zu begründen versucht hat, und als sowohl Ach wie neuerdings Bühler die Einführung dieser Methode als ein besonderes Verdienst Marbes gepriesen haben. Als Marbe'sche Methode war mir aber diese vollkommen begreiflich. Denn ich halte Marbe für einen Mann, der wohl einmal ein sinnreiches Instrument konstruieren kann, dem aber zum Psychologen alle und jede Begabung fehlt, so dass ich mich längst daran gewöhnt habe, seine in dieser Richtung liegenden Arbeiten im wesentlichen als nicht existierend zu betrachten und mich nur jedesmal wieder darüber wundern muss, wenn mir eine solche Arbeit, wie z.B. die über das Urteil, zu Gesicht kommt, wie jemand, der doch etwas Naturwissenschaften getrieben hat, so sehr aller wissenschaftlichen Methodik entbehren kann.]

Wundt then addressed Külpe's role.

I assumed that you were taking a conciliatory attitude, as I know you to do; you would let people continue work along those lines and then let your reaction depend on the results. I thought this more likely than actual enthusiasm for this procedure on your part. But now I see that I was mistaken about this....

[...so nahm ich an, dass Sie vermöge der konzilianten Gesinnung, die ich an Ihnen kenne, mehr die Leute, die in dieser Richtung arbeiten, gewähren lassen und es darauf ankommen lassen wollen, was bei der Sache etwa doch herauskommen könne, als dass ich eine eigene Begeisterung für dieses Verfahren bei Ihnen vorausgesetzt hätte. Nun sehe ich freilich, dass ich mich darin wirklich geirrt habe....]

Wundt rejected Külpe's suggestion that the thought experiments simply carried out implications of

Wundt's theory of will.

I confess that I find this difficult to understand, and I must therefore refer again and again to the necessity of not confusing the concept of will [Willenbegriff] in metaphysical voluntarism with the empirical-psychological concept of will. With regard to the latter, I have long constantly referred on the one hand to the close relationship of will to the feelings, and on

the other hand to the inadmissible abstract theory of will from vulgar indeterminism. Similarly, I have long held that the old pleasure-displeasure [Lust-Unlust] theory of feelings, to which you still adhere, is inadequate.

[Ich gestehe, dass mir das schwer begreiflich ist, dass ich aber dabei allerdings wiederholt auf die Notwendigkeit hinweisen muss, dass man den Willensbegriff des metaphysischen Voluntarismus nicht mit dem empirisch-psychologischen Begriff des Willens vermenge. Was diese betrifft, so habe ich seit langer Zeit stets einerseits auf den engen Zusammenhang des Willens mit den Gefühlen andererseits auf die unzulässige abstrakte Willenstheorie des vulgären Indeterminismus hingewiesen, ebenso wie ich hinwiederum seit langer Zeit die alte, von Ihnen ja ebenfalls geteilte Lust-Unlusttheorie der Gefühle für unzulänglich gehalten habe.]

With the use of bodily correlates as controls for subjective observations of feelings [Erst die an der Hand der Ausdrucksmethoden ermöglichte Kontrolle der subjektiven Beobachtungen der Gefühle], Wundt explained, it became possible to investigate the relationship between feeling and willing experimentally. This did not mean, however, that Wundt would accept "the so-called *actus purus*" as a psychic element.

I have always claimed that analysis of complex phenomena is the only path that leads to the goal in psychology, and from early on I considered the sensations [Empfindungen] and the feelings [Gefühle] to be the elements [Elemente] to which this analysis would lead every time. Of course I also believe that one must accept the principle of creative synthesis [schöpferische Synthese] in order to make good use of the results of such an analysis.

[Ich glaube stets die Analyse der komplexen Phänomene für den einzigen Weg gehalten, der in der Psychologie zum Ziel führt und frühe schon in den Empfindungen einerseits und den Gefühlen andererseits die Elemente gesehen, auf die jederzeit diese Analyse hinführt. Freilich meine ich auch, dass man das Prinzip der schöpferischen Synthese hinzunehmen muss, um die Resultate einer solchen Analyse richtig zu würdigen.]¹¹⁰

Wundt told Külpe that he did not want to force his theories on anyone; he just wanted to state that his theory of will should in no way be construed to support the *Ausfrageexperimente*. When Külpe again pressed that point, Wundt insisted that their argument would "not disappear so quickly." Recalling the words of Heraclitus, Wundt noted that

...war is the father of all things and that from this 'for' and 'against' something worthwhile will eventually issue. In the meantime, each can still entertain hope that he can bring the other over to his side.

[...dass der Krieg der Vater der Dinge ist, und dass aus dem Für und Wider schliesslich doch irgend etwas Erpriessliches herauskommen wird. Jeder kann dann mittlerweile sich immerhin der Hoffnung hingeben, dass er den Andern noch einmal auf seine Seite ziehen wird.]¹¹¹

¹¹⁰ Wundt to Oswald Külpe, 26 October 1907, UAL, Wundt Nachlass, Nr. 414.

¹¹¹ Wundt to Oswald Külpe, 31 December 1907, UAL, Wundt Nachlass, Nr. 415.

Although Külpe never changed his mind, Wundt repeatedly asked him to reconsider the tri-dimensional theory of feelings, as the Leipzig Institute continued to publish work based on it.¹¹²

Meumann shared Wundt's surprise that Külpe defended the Würzburg experiments:

It almost seems to me that his joy over his 'school' has turned his head. This has a very unfortunate effect on the 'school': it gradually develops into a clique, which brings an unpleasant tone into our discussion.

[Es scheint mir fast, dass die Freude über seine 'Schule' ihm etwas den Kopf verdreht hat. Auf die 'Schule' wirkt das in einem sehr übelen Sinne zurück, denn sie wächst sich allmählich zu einer Klicke aus, die keinen erfreulichen Ton in unsre Diskussion bringt.]

Meumann was probably a little jealous of Külpe's institute and his following. Having just gotten some money for research in Münster, he nevertheless complained, "It is still a great burden for me that I have no self-reliant collaborators--I have to do everything myself." [Es belastet mich aber noch sehr, dass ich keine selbständigen Mitarbeiter habe, ich muss alles selbst machen.]¹¹³

Although Meumann found the Würzburg group to be troublesome,¹¹⁴ he suppressed any inclination to turn them out of his journal.

I am convinced that the *Archiv* has great importance in current psychology--it is the only dam that we can throw up against the cliques [Kliquenwesen]. As soon as the *Archiv* were to fold, the Würzburger would all go over to Ebbinghaus and help him and the Göttinger [G.E. Müller and his students Schumann, Ach, etc.] suppress, in the most intolerant way, everything in any way connected to Leipzig traditions.

[...ich sehe immer wahr, dass das 'Archiv' eine grosse Bedeutung in der gegenwärtigen Psychologie hat; es ist der einzige Damm, den wir dem Kliquenwesen entgegenstellen können. Sobald das Archiv einginge, würden sämtliche 'Würzburger' zu Ebbinghaus übergehen und mit diesem und den Göttingern alles in der intolerantesten Weise unterdrücken, was mit den Leipziger Traditionen irgend zusammenhängt.]¹¹⁵

Wundt agreed with that assessment of Leipzig psychology versus the others:

[The *Archiv* is] a bulwark against the fellowship--I do not want to use the term 'clique'--which has spread over Göttingen [Müller], Würzburg [Bühler], Frankfurt [Marbe], etc., and finds its representation in Ebbinghaus's journal.

[...dass das Archiv aufrecht erhalten werden muss, schon als Schutzwehr gegen die über Göttingen, Würzburg, Frankfurt u.s.w. ausgebreitete Genossenschaft (ich will den Ausdruck

¹¹² Wundt to Oswald Külpe, 4 January 1911, UAL, Wundt Nachlass, Nr. 422.

¹¹³ Ernst Meumann to Wundt, 6 May 1908, UAL, Wundt Nachlass, Nr. 735.

¹¹⁴ They complained when Meumann allowed Wundt a final response to Bühler's defense. Karl Bühler, "Antwort auf die von W. Wundt erhobenen Einwände gegen die Methode der Selbstbeobachtung an experimentell erzeugten Ergebnisse," *Archiv für die gesamte Psychologie*, 12 (1908), 93-122. Wundt, "Kritische Nachlese zur Ausfragemethode," *Archiv für die gesamte Psychologie*, 11 (1908) 445-459.

¹¹⁵ Ernst Meumann to Wundt, 2 August 1908, UAL, Wundt Nachlass, Nr. 737.

Clique nicht brauchen), die in der Ebbinghaus'schen Zeitschrift ihre Vertretung findet.]¹¹⁶

Although Wundt and his Institute had at least this stake in the *Archiv*, he occasionally had to disagree with its editor.

4. An argument with Meumann about pure and applied psychology, 1908-1909.

In the summer of 1908, as they criticized Külpe and his students, Meumann sent Wundt his first large theoretical work in psychology, a treatise on "intelligence and will."¹¹⁷ At issue were the alternative theories of mind that divided philosophers: the intellectualist and the volitional theories. The crux of the argument was whether mental capacities and faculties, or drives and impulses had priority in determining the structure and action of mind. Wundt favored the latter view, i.e. the will determines the intellect more than the other way around. Meumann took the opposing view and supported it with examples from educational psychology. His approach to the question led Wundt to conclude that an intellectualist view of mind could result when practical interests overrode theoretical soundness.

Wundt responded to Meumann's book with a rather personal critique, and Wundt's wife and son were concerned that he would offend his "most loyal follower" [dass Du deinen letzten Getreuen vor den Kopf stiessest].¹¹⁸ In light of the growth of psychological thought to the contrary, Wundt thought it necessary to emphasize that pure [reine] psychology made applied [angewandte] psychology possible, *not* the other way around.

Wundt supported his point with examples from natural science. Chemistry did not achieve its amazing applications until some pharmacists in the early nineteenth century put aside their practical problems in the interest of purely theoretical questions. Likewise, neither Faraday nor more recently Röntgen made their discoveries in search of the practical applications that issued; they were doing purely scientific investigations into the nature of electricity and radiation.¹¹⁹

Wundt recalled that Meumann's career began with fine experimental studies on time-sense and the

¹¹⁶ Wundt to Ernst Meumann, [August 1908], UAL, Wundt Nachlass, Nr. 738.

¹¹⁷ Ernst Meumann, *Intelligenz und Wille* (Leipzig: Quelle und Meyer, 1908).

¹¹⁸ Sophie Mau Wundt to Wundt, 8 April 1909, UAL, Wundt Nachlass, Nr. 1634-4a.

¹¹⁹ Wundt, "Über reine und angewandte Psychologie." *Psychologische Studien*, 5 (1910), 1-47; 13.

aesthetics of rhythm. After ten years of work in applied psychology, he then published his lectures on experimental pedagogy.¹²⁰ By that time Meumann had reversed the proper sense of the relationship between theory and practice in his work, or so Wundt feared. Models of intellectual capacities had practical uses in education, but Meumann slipped into the "old routine of using concepts of faculties" [schablonenhafte Verwendung der Vermögensbegriffe] and let "experimental analysis of psychic processes slip into the background" [experimentelle Analyse der psychischen Vorgänge in den Hintergrund treten].¹²¹ Wundt's essay closed with the hope that his pupil would find the way back to purely psychological, specialized research [zur rein psychologischen Einzelforschung] and therefore to better theory.

Sophie and Max Wundt were worried about Meumann's sensitivity, but Wundt believed that criticism was necessary to the growth of science. As he wrote in reference to his articles against Külpe and Meumann:

That things do not get started without struggles is not only natural but also useful. Otherwise science would settle into an idle lethargy.

[Dass es dabei ohne Kämpfe nicht abgeht, ist übrigens nicht nur natürlich, sondern auch nützlich, sonst würde die Wissenschaft leicht in tatenlose Lethargie verfallen]¹²²

In his observation on healthy scientific struggle, however, Wundt seemed to be unaware that he and his students were psychologically not equals, hence not able to argue on the same level. Wundt was not only a powerful father figure, but also a very old one, nigh unto his eightieth birthday.

C. Can Wundt pass his torch?

i. "A considerable movement among young philosophers" ca. 1910.¹²³

In the second decade of the twentieth century, certain openings allowed experimental psychologists to assume a larger share of German professorships in philosophy. Benno Erdmann's call to Berlin in 1909 marked a definitive end to his experimental work and finally brought Oswald Külpe the elusive

¹²⁰ Ernst Meumann, *Vorlesungen zur Einführung in die experimentelle Pädagogik und ihre psychologischen Grundlagen*, 2 vols. (Leipzig: Engelmann, 1907-08).

¹²¹ Wundt, 46-47.

¹²² Wundt to Friedrich Kiesow, 23 October 1911, UAL, Wundt Nachlass, Nr. 227.

¹²³ Appendices II and III are useful references for this section.

Prussian professorship, Erdmann's chair in Bonn. Külpe's increased prestige was accompanied by increased funding for the Bonn institute.

Külpe's replacement in Würzburg was Karl Marbe, who vacated a professorship at the Frankfurt Academy. This institution was preparing to become a full university (finally accomplished in 1914), and Marbe's position was divided into a chair for psychology and another for systematic and historical philosophy.

In response to an inquiry from Frankfurt, Wundt offered his evaluation of candidates for both positions. He recommended Felix Krueger for psychology, "next to Stumpf the best specialist in psychological acoustics," and he emphatically recommended *against* Friedrich Schumann: "He is essentially a technician without original ideas, and I hear from Zürich that he is considered a very mediocre lecturer there." [Er ist im Wesentlichen Techniker, ohne selbständige Ideen und gilt, wie ich aus Zürich gehört habe, dort für sehr mässige Lehrkraft.] Wundt had better things to say about Narziss Ach (Meumann's successor in Königsberg) but found him also to be technically inclined [eines vorwaltend technischen Interesses]. Erich Becher (Meumann's successor in Münster) was said to be a good lecturer, but he had not yet published substantial work in experimental psychology. G.F. Lipps was a very clear lecturer, but Wundt did not consider him a good choice for director of a laboratory; he would be more appropriate for systematic philosophy. Wundt had only negative comments on Karl Bühler.

For the second Frankfurt professorship, Wundt recommended his student Raoul Richter, then Extraordinarius at Leipzig. He was not impressed by the other candidates—Ewald, Bauch, Frischeisen-Köhler, and Misch—but Wundt did suggest another name for the list: Ernst Cassirer, whose book, *Das Erkenntnisproblem in der Philosophie und Wissenschaft der neueren Zeit*, was "one of the best works in history of philosophy to appear in recent years."¹²⁴

The Frankfurt search brought no gain for Wundt's camp: Schumann for psychology and Hans Cornelius for systematic and historical philosophy. Cornelius felt fortunate to get the position, since his senior colleague in Munich, Theodor Lipps, disliked him professionally and personally.¹²⁵ A Machian of

¹²⁴ Wundt to [Frankfurt colleague], draft, 3 December 1909, UAL, Wundt Nachlass, Nr. 999b.

¹²⁵ "Hans Cornelius," in *Die deutsche Philosophie der Gegenwart in Selbstdarstellungen*, ed. Raymund Schmidt, vol. 2 (Leipzig: Felix Meiner, 1921), 81-99; 88-89.

sorts, Comelius found himself in more compatible surroundings in Frankfurt, where he took interest in the work of Schumann, Max Wertheimer, Wolfgang Köhler, and Kurt Koffka on early Gestalt psychology. Wundt, on the other hand, was having trouble placing his most qualified Leipzig people: Krueger, Richter, and G.F. Lipps.

Wundt assessed the overall situation in German psychology and philosophy in a letter to his son Max: "There is now a considerable movement among young philosophers. [Es ist ja nun eine ziemliche Bewegung unter die jungen Philosophen gekommen.] Hamburg, Marburg, and Jena, he explained, each wanted a philosopher in some way appropriate for psychology--not a pure psychologist, but if possible a philosopher for everything [einen irgendwie psychologisch geeigneter Philosophen, aber doch keinen reinen Psychologen, sondern womöglich einen Philosophen für alles]. Although Wundt recommended G.F. Lipps for Jena and Marburg, the results in Frankfurt had left him bitter: "My recommendations, as is well known, usually do not do much good." [Aber meine Empfehlungen pflegen bekanntlich nichts zu nutzen.]¹²⁶

Wundt understood that universities wanted technically proficient experimental psychologists who were also theorists, i.e. philosophers. The people Wundt had trained in this manner, however, were not getting the positions; instead the "technicians" were gaining ground. Schumann, for example, not only became professor in the soon-to-be-established Frankfurt University, he also succeeded Ebbinghaus as editor of *Zeitschrift für Psychologie und Physiologie der Sinnesorgane*. Marbe had Külpe's chair in Würzburg, and a couple years later Erich Jaensch (a student of G.E. Müller) was the first experimentalist to become Ordinarius in Marburg. This *Berufung* stirred up a storm of protest from philosophers who objected to the gains of experimental psychology at the expense of general philosophy. A subsequent section discusses this controversy.

Outside of Leipzig Wundt's losses in 1910 were balanced by modest gains. Psychology in Zürich returned to his fold once Schumann left. Gustav Störing took an active interest in experimental work again and directed the psychological institute, something he had refused to do five years earlier. The next year Störing replaced Theobald Ziegler, a specialist in pedagogy at Strassburg, and opened a new

¹²⁶ Wundt to Max Wundt, 7 December 1910, UAL, Wundt Nachlass, Nr. 1642.

psychological institute there.¹²⁷ G.F. Lipps succeeded Störing in Zürich, finally leaving Leipzig for his first professorship.

Closer to home, 1910 turned out to be a very good year for Wundt's students, especially Meumann and Krueger.

2. Meumann comes to Leipzig; Krueger succeeds him in Halle; Meumann leaves for Hamburg; the Leipzig Institute reorganizes.

Wundt apparently intended for Meumann to be his successor in Leipzig. The word "apparently" must be emphasized here: they had their differences, and the situation that finally brought Meumann was rather complicated. Max Heinze, Wundt's colleague who came to Leipzig the same year he did, died in 1909. Johannes Volkelt assumed Heinze's professorship for philosophy and vacated the one for philosophy and pedagogy. Meumann was called to the latter chair in 1910 and was given a new Institute for Experimental Pedagogy with six newly furnished rooms, a 1200-mark annual budget, and Wundt's promise to provide such supplemental rooms and equipment as needed.¹²⁸

Meumann not only joined his teacher in Leipzig, he also managed to make Felix Krueger his successor in nearby Halle. Max Wundt aptly described the significance of Krueger's appointment:

Without doubt he has earned the best reputation, next to Richter; and it is very fortunate that this will bring more breathing room among the Leipzig psychologists. Objectively, it is certainly a welcome thing that this particular student of yours, who in spite of his great independence of mind still holds true to your course, now takes his place in Prussian philosophy. I hope that this *Berufung* will also benefit *Völkerpsychologie*, which is otherwise very much neglected due to lack of suitable people.

[Er hat ohne Zweifel neben Richter am meisten einen Ruf verdient; und es ist sehr erfreulich, dass dadurch unter den Leipziger Psychologen wieder etwas mehr Luft wird. Sachlich ist es gewiss sehr zu begrüßen, dass gerade dieser Schüler von Dir, der bei grosser Selbständigkeit des Denkens doch Deinen Bahnen treu bleibt, nun in die preussische Philosophie einreicht. Auch der Völkerpsychologie, die sonst mangels geeigneter Leute allzu sehr vernachlässigt wird, hoffe ich, soll diese Berufung zu gute kommen.]¹²⁹

A comment by Mrs. Wundt indicates what Max may have meant by the need for breathing room in Leipzig. "How [Krueger] will be envied!" she wrote. "Poor Wirth!" [Wie wird er beneidet werden.

¹²⁷ Gustav Störing to Wundt, 31 December 1911, UAL, Wundt Nachlass, Nr. 1496.

¹²⁸ Paul Müller, *Ernst Meumann als Begründer der experimentellen Pädagogik* (Dissertation, University of Zürich, 1942), 46.

¹²⁹ Max Wundt to Wundt, 4 July 1910, UAL, Wundt Nachlass, Nr. 1641-4.

Der arme Wirth!]¹³⁰ Wundt's *Mitdirektor* had been Extraordinarius since 1906, but Privatdozent Krueger, with his wider experience and more varied interests, became Ordinarius in Halle.

Now two experimental psychologists were full professors at Leipzig--but this did not last long. After only one semester in Leipzig, Meumann informed Wundt that he had accepted an attractive offer from the Hamburg Kolonialinstitut: a salary of 18,000 marks, another 18,000 marks to outfit a new psychological laboratory, 1800 marks for an assistant's salary, an annual budget of 3000 marks for apparatus, and money for books as needed. These were substantial monetary resources, but in exchange for them Meumann gave up a professorship in a major German university, with all the prestige and advantages that entailed--not the least, the chance to succeed his mentor.

Meumann was obliged to explain his decision to Wundt, especially why he would take a non-university position. Very probably, Meumann's biggest problem was his discomfort in working so close to his mentor. His explanation, however, began with the observation that research had always interested him more than academic teaching [meiner Neigung nach stets mehr wissenschaftlicher Forscher als akademischer Lehrer]. In Leipzig, examinations and lectures allowed no time for his own projects, and those tasks wrecked his nerves so badly that his physician had prescribed a reduced schedule. So Meumann asked Wilhelm Wirth to teach the large psychology course in the coming semester, and Meumann prepared go to Hamburg in the fall.¹³¹

Wundt responded with a mixture of fatalism and restrained disappointment: "It is of course not possible to take back such a step once made, even if you wanted to, and I cannot presume that you do." [Rückwärts tun lässt sich ja der einmal getane Schritt doch nicht, auch wenn Sie wollten, was natürlich sich nicht voraussetzen lässt.]¹³²

Mrs. Wundt understood that Meumann's abrupt departure complicated Wundt's plans for retirement. While nursing her health at a spa, she met a student from Bonn who told her how Külpe had required him to learn Wundt's *Grundzüge* "almost by heart."

¹³⁰ Sophie Mau Wundt to Wundt, 30 June 1910, UAL, Wundt Nachlass, Nr. 1635-7.22

¹³¹ Ernst Meumann to Wundt, 19 April 1911, UAL, Wundt Nachlass, Nr. 747.

¹³² Wundt to Ernst Meumann, 9 May 1911, UAL, Wundt Nachlass, Nr. 748.

I think, my Papa, that you really ought now to consider Külpe for *your* successor. Meumann would also teach a different psychology than yours; perhaps the storm of the *Ausfrageexperimente* has made Külpe turn over a new leaf, and perhaps his students will no longer present themselves as your enemies. It would really be nice, if this personally warm and faithful man were not so deeply offended, as he might be if, for example, Krueger were called. It would also be much easier for Wirth. Of course, there is still time for this. It just interested me to hear that Külpe uses *your* psychology text.

[Ich glaube, mein Papa, als *deinen* Nachfolger sollst du jetzt doch an Külpe denken. Eine andere Psychologie als die *deinige* würde auch Meumann lehren und vielleicht hat das Gewitter der *Ausfrageexperimente* ihn doch etwas in sich gehen lassen und seine Schüler treten nicht mehr als deine Feinde auf. Es wäre doch nett, wenn dieser persönlich so warme und treue Mensch nicht so tief gekränkt würde, wie es z.B. durch eine Berufung von Krüger geschehen müsste. Auch für Wirth wäre es leichter. Aber das hat ja noch Zeit, es war mir nur interessant zu hören, dass Külpe *deine* Psychologie benutzt.¹³³

These comments indicate that Wundt may have already considered Krueger for his successor, although his preference had been Meumann. If Wundt ever followed his wife's suggestion to consider Külpe for the job, the events of 1913 would have killed the idea: Wundt and Külpe were on opposite sides of still another controversy in psychology (next section), and Külpe was called to replace the ailing Theodor Lipps in Munich and to outfit a new psychological institute there.

For the vacancy he left in Leipzig, Meumann suggested first Störing, then Karl Groos of Giessen,¹³⁴ but Eduard Spranger was called. The new professor for philosophy and pedagogy was not interested in experimental work, so Meumann's institute was consolidated into Wundt's, and Privatdozent Max Brahn directed the work in experimental pedagogy.

The next year, in August of 1912, Wundt celebrated his eightieth birthday, and the year was marked by several developments both for Wundt and the Institute. In honor of the occasion, Otto Klemm collected the "Wilhelm Wundt Stiftung," 7000 marks to support research in experimental phonetics.¹³⁵ During the same month Wundt began negotiating the transfer of his publishing business from Engelmann Verlag to Alfred Kröner Verlag,¹³⁶ which was owned by Klemm's family.¹³⁷

In the catalogue for winter-semester 1912, the Institute was organized into sections [Abteilungen],

¹³³ Sophie Mau Wundt to Wundt, 22 April 1911, UAL, Wundt Nachlass, Nr. 1635-8.1.

¹³⁴ Ernst Meumann to Wundt, 19 April 1911, UAL, Wundt Nachlass, Nr. 747. Ernst Meumann to Wundt, 16 October 1911, UAL, Wundt Nachlass, Nr. 750.

¹³⁵ Wundt to Otto Klemm, 25 August 1912, UAL, Wundt Nachlass, Nr. 255. See also the documentation in Hans Hiebsch, *Wilhelm Wundt und die Entstehung der Psychologie* (Berlin: Gesellschaft für Psychologie der DDR, 1980), 5.

¹³⁶ E. Reinicke to Wundt, 17 October 1912, UAL, Wundt Nachlass, Nr. 1693-2.

¹³⁷ See the entry for "Wilhelm Klemm" in *Neue Deutsche Biographie*.

each one headed by a different section leader [Abteilungsvorstand]: Wirth for psychophysics, Ottmar Dittrich for experimental phonetics and psychology of speech, Klemm for sensory psychology, Paul Salow for psychology of emotional functions, and Brahn for experimental pedagogy. (See Appendix I for the German titles.) To finance these changes, Wundt requested a 2000-mark grant for equipment, noting that he had never asked for extra money since the establishment of the 1200-mark budget in 1883.¹³⁸ Wundt not only got the grant, but also something he did not even ask for—an increase in the annual budget from 1200 to 2000 marks.¹³⁹ The increase was justified by the Institute's absorption of Meumann's Institute for Pedagogical Psychology.

By this time Wundt could anticipate even more expansion for his Institute. Karl Lamprecht (1856-1915), the controversial cultural historian who advocated application of scientific psychology to historical studies, led a campaign to secure city and private funds in support of *Geisteswissenschaften* in Leipzig. His plan paralleled that of the Kaiser-Wilhelm-Gesellschaft to fund the *Naturwissenschaften* in Prussia. The Leipzig research institutes [Sächsische Staatliche Forschungsinstitute] would range over several areas of history, economics, and philology, as well as Wundt's psychology and Lamprecht's "cultural and universal history."¹⁴⁰ As Max Wundt remarked to his father, "Probably no other university can compete with the support for *Geisteswissenschaften* in Leipzig." [Mit dem Leipziger Mitteln für Geisteswissenschaften kann wohl kaum noch eine Universität konkurrieren.]¹⁴¹

Before the Sächsische Staatliche Forschungsinstitute or the Kaiser-Wilhelms-Institute were actually functioning, the World War had begun. In the meantime, Wundt did battle with some philosophers who wanted to expel experimental psychologists from their ranks, and with some of the latter, particularly Külpe, who seemed inclined to let them do it.

¹³⁸ Wundt to KM, 20 October 1912, UAL, RA 979, Universitäts-Rentamt, Psychologisches Institut 1882, Bl. 25.

¹³⁹ Universitäts-Rentamt to KM, 1 November 1912, UAL, *ibid.*, Bl. 26.

¹⁴⁰ Hans Haas, "König-Friedrich-August-Stiftung für wissenschaftliche Forschung zu Leipzig (Sächsische Staatliche Forschungsinstitute)," in *Forschungsinstitute, ihre Geschichte, Organisation, und Ziele*, eds. Ludolph Brauer, Albrecht Mendelssohn-Bartholdy, and Adolf Meyer, vol. 1 (Hamburg: Paul Hartung, 1930), 374-386.

¹⁴¹ Max Wundt to Wundt, 9 June 1913, UAL, Wundt Nachlass, Nr. 1643-2.

3. The “crisis of psychology” of 1913: Is experimental psychology part of philosophy or medicine, or should it be independent?

In 1912 and 1913 professors of philosophy devoted much attention, and a considerable quantity of ink, to a discussion of the place of experimental psychology in the curricula of German universities. This controversy is the subject of an article by Mitchell Ash, who addresses several issues concerning the institutional status of psychology.¹⁴²

Ash notes that some philosophers criticized experimental psychology prior to the full-blown controversy. Dilthey’s critique of “constructive and explanatory psychology” in 1894, discussed in Chapter Seven, found that certain experimental psychologists failed to understand the special nature of philosophical and historical studies. Dilthey proposed “analytic and descriptive psychology” as the proper basis for *Geisteswissenschaften*, but he was far from rejecting experimental psychology out of hand.

The criticism became steadily harsher, as experimental psychologists increased their numbers among German philosophers. In 1909 Wilhelm Windelband complained that German philosophy had degenerated into history of philosophy (his own specialty) and very technical experimental psychology:

For a time in Germany it was almost so, that one had already proven himself capable of ascending a philosophical pulpit [Kathedrar] when he had learned to type methodically on electrical buttons and could show statistically in long experimental series carefully ordered in tables that something occurs to some people more slowly than it does to others.¹⁴³

Although Windelband stated that a renewed Hegelianism was directing attention back to true philosophical questions--those relevant to political, religious and social life--his bitter attack surely reflected the fact that experimental psychologists were still increasing their share of German professorships of philosophy, especially since 1905.

Husserl’s “Philosophy as rigorous science” (1910/11), already discussed in the context of the Würzburg thought experiments, refuted experimental psychology’s claims to general philosophy from a

¹⁴² Mitchell G. Ash, “Wilhelm Wundt and Oswald Külpe on the institutional status of psychology: An academic controversy in historical context,” in *Wundt studies, a centennial collection*, eds. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 396-421.

¹⁴³ Wilhelm Windelband (1909), quoted in Ash, *ibid.*, 400.

theoretical standpoint that was more fully developed than Windelband's. On the institutional side, Husserl hinted that natural scientists used their increased influence in faculty committees to promote experimental psychology at the expense of pure philosophy.

In addition to the criticisms from philosophers, Ash mentions the possibility that psychologists also felt pressure to justify their requests for institutes and equipment by developing more practical applications. Although the evidence for this pressure is not abundant, German psychologists certainly had the examples of the practical American and the clinical French psychologists. A few in Germany, notably Karl Marbe, were beginning to apply experimental psychology to practical areas like advertising and law.

Into this milieu of criticism, Oswald Külpe presented his proposal. He suggested that experimental psychologists and their institutes be moved into medical faculties and that experimental psychology be required for medical examinations, as was psychiatry. The participation in medical training, Külpe predicted, would ensure better funding for psychological laboratories, and the institutional separation from philosophy would free experimental psychologists from the burdens of teaching systematic topics (logic, ethics, metaphysics) and history of philosophy. In the defense of his younger colleagues, Külpe claimed that experimental psychology had developed into such a complex field, that its specialists had no time to keep up with developments in philosophy.

The aspect of the proposal that interested experimental psychologists most was their release from the chore of teaching traditional topics of philosophy that did not interest them. The bulk of Külpe's article, however, was devoted to application of experimental psychology's methods to an investigation of mental blindness [Seelenblindheit], a neurological disorder in which the patient appears to have normal sensory equipment but cannot recognize things perceived. Külpe's emphasis was appropriate, since his article appeared in the first volume of Robert Sommer's journal for psychopathology.¹⁴⁴

Külpe's connections to medical training deserve closer inspection. He was professor for nearly two decades at Würzburg University, where medical enrollments exceeded those in the other faculties. Würzburg was a major university in terms of its medical program but only a small one in terms of

¹⁴⁴ Oswald Külpe, "Psychologie und Medizin," *Zeitschrift für Pathopsychologie*, 1 (1912), 187-267.

philosophy. Külpe's relations with psychiatrists and physiologists in Würzburg, particularly the physiologist Max von Frey, were very friendly. In 1907, moreover, Külpe received an honorary doctorate of medicine from Giessen, where Robert Sommer was professor of psychiatry. Finally, Wundt's criticism of Würzburg thought experiments may have given Külpe reason to consider a home for experimental psychologists outside of philosophy. The timing for this connection is supported by one of Ash's sources, who notes that Külpe had intended to make the proposal in 1908, before his appointment to Bonn postponed the plan. Külpe's interest in psychiatry parallels the interest of G.E. Müller and Ebbinghaus in physiology. These trained philosophers sought justification for their psychological approach in medical science, whereas Wundt, trained in medicine and physiology, sought to keep a clear distinction between those fields and experimental psychology and to keep the latter within philosophy.

Külpe had actually mentioned his idea to Wundt, more than a decade before he published the proposal. At that time Wundt found the suggestion rather humorous:

I have not yet heard anything of the rumor you mention and about which you inquire. I can scarcely ascribe any intrinsic probability to it, particularly since the central and northern-German psychiatrists, at any rate, have very little inclination to concern themselves with experimental psychology. In southern Germany there are some excellent workers with a different opinion--[Emil] Kraepelin [in Heidelberg], [Konrad] Rieger [in Würzburg], [Robert] Sommer [in Giessen]. But in my region of the country, I would know of no one, besides [Theodor] Ziehen [in Jena], who would not reject with indignation the expectation that he should concern himself with something other than nerve pathology and brain anatomy. So I can imagine with perfect tranquillity the moment when the Saxon administration puts my institute under the direction of my colleague [Paul] Flechsig. And I would be curious to see what he does with the instruments.

[Von dem Gerücht, das Sie erwähnen, und dem Ihre Anfrage gilt, habe ich noch nichts gehört. Ich schreibe demselben auch geringe innere Wahrscheinlichkeit zu, und zwar deshalb, weil wenigstens bei den mittel- und norddeutschen Psychiatern nur sehr wenig Geneigtheit vorhanden sein dürfte, sich mit experimenteller Psychologie zu befassen. In Süddeutschland gibt es ja hervorragende Kräfte, die anders gesinnt sind--Kraepelin, Rieger, Sommer. Aber hier zu Lande wüsste ich ausser Ziehen keinen, der die Zumuthung, sich ausserhalb der Nervenpathologie mit etwas anderem als mit Gehirnanatomie zu befassen, nicht mit Entrüstung zurückweisen dürfte. Im übrigen sehe ich mit vollkommener Seelenruhe dem Augenblick entgegen, wo die sächsische Regierung mein Institut der Direktion meines Collegen Flechsig unterstellen wird. Auch bin ich neugierig zu sehen, was er mit den Instrumenten anfängt.]¹⁴⁵

The passage of years did not change Wundt's view that psychiatry and experimental psychology should remain in different faculties of the university.

¹⁴⁵ Wundt to Oswald Külpe, 29 July 1899, UAL, Wundt Nachlass, Nr. 396.

Shortly after Külpe published his proposal in 1912, another event aggravated the issue of experimental psychology's proper place in the German university. At the Prussian university of Marburg, the experimentalist Erich Jaensch was called to the professorship of philosophy vacated by the retirement of Hermann Cohen, the leader of the "Marburg Neo-Kantians." The faculty had been petitioning for a third Ordinarius to cover psychology, but the Prussian ministry gave the vacant chair to Jaensch, in spite of objections by the other philosophers. Cohen and Paul Natorp, the other Neo-Kantian Ordinarius, had hoped to continue the Marburg tradition by bringing in Ernst Cassirer, Cohen's intellectual heir.

In a newspaper article, an unusually public forum for a philosopher, Natorp decried the growth of experimental psychology at the expense of historical and systematic philosophy. He also charged that Cassirer (a Jew and a liberal, like Cohen) had been passed over for political reasons. Then in February 1913, a proclamation signed by Natorp and a total of 107 scholars was sent to the philosophical faculties and educational ministries of all German-speaking universities. The statement urged that chairs of philosophy should not be filled with representatives of experimental psychology and that those which had been so filled should be restored to non-psychologists. Ironically, the proclamation praised the advances of experimental psychology and called for establishment of separate chairs for its specialists. The appeal attracted a few signatories among unwary experimental psychologists—for example, G.F. Lipps and August Messer.

Wundt swiftly composed a response both to Külpe's article and the proclamation of the philosophers. His treatment of the problem, as Ash characterizes it, was a very realistic argument for the status quo.

Wundt's little tract on "Psychology in the struggle for existence" pointed out that the authors of the proclamation certainly did not have experimental psychology's interest at heart, in spite of the perfunctory call for more professorships for psychologists. He alluded here to Windelband's hostile words. One of the proclamation's supporters who stayed on friendly terms with Wundt, Alois Riehl, later admitted to Wundt that the original text had not included the part about new professorships for experimental psychology and that he had insisted on this revision.¹⁴⁶ Even if the philosophers had been so

¹⁴⁶ Alois Riehl to Wundt, 26 February 1913, UAL, Wundt Nachlass, Nr. 1391.

kindly disposed toward experimental psychology, they knew as well as Wundt that additional professorships would not appear overnight. The primary aim of the hostile philosophers was to drive experimentalists from their midst.

Wundt evaluated Külpe's proposal and found it unrealistic in the context of current medical education. Only a few psychiatrists wanted or needed training in experimental psychology, and these could get this training in such institutes as presently existed. Wundt still believed, as he did when Külpe first mentioned the idea, that a medical faculty would not accommodate psychological research.

Wundt could not sympathize with Külpe's claim that experimental psychologists had too much to learn and could not learn philosophy as well. He advised anyone with that complaint to look for another profession. (Recall that Wundt's theory of mind emphasized volitional drives, not mental capacities.)

Wundt raised some curious objections to making experimental psychology a distinct subject for examinations. Someone who was examined in the psychology of one school of thought, he claimed, would be entirely unprepared for an examination by a psychologist from another school. An examination in history of philosophy, by contrast, would be more objective. Wundt identified three incompatible schools of experimental psychology: the associationists, the apperceptionists, and the thought psychologists. The last two referred to Leipzig and Würzburg; the first designation apparently referred to the technical group associated with G.E. Müller. Ash is probably correct that Wundt exaggerated the differences between psychologists, but why did he do this? Did he simply want to defend his point that experimental psychologists should not examine medical doctors? Wundt was unlikely to stretch his argument that far. Was he admitting that, at this point, his own field of specialization lacked the maturity to be a field of examination? This also seems unlikely.

What is clear is that Wundt opposed any separation of experimental psychology from philosophy, even for the purposes of examinations. His conception of scientific psychology included not only the experimental approach, but also the empirical *Völkerpsychologie*, and the latter could certainly not fit into the medical curriculum. Whereas Külpe commended American universities for their dozens of psychological laboratories and their separate departments of psychology, Wundt observed that these

were so intimately involved with educational and other practical concerns, as to contribute practically nothing to the advance of general psychological theory. Wundt had no desire to follow the example of the Americans in this regard. A separation of the experimental from the other types of psychology, he predicted, would give free rein to the "technicians" and applied psychologists who distracted attention from theoretical work. Such "technicians" were the ones who had provoked the philosophers' hostility in the first place.

A related point, which Ash's article does not notice, is Wundt's contention that a separation would be as bad for general philosophy as for experimental psychology. The philosopher would become "an abstract epistemologist, unconcerned with the progress of the positive sciences, enthroned in the lonely heights of absolute speculation" [abstrakter Erkenntnistheoretiker, unbekümmert um den Gang der positiven Wissenschaften, in der einsamen Höhe voraussetzungsloser Spekulation thronen].¹⁴⁷ Likely Wundt had in mind certain philosophers, such as Husserl, who would deny the value of experimental psychology to general philosophy. In short, Wundt emphasized that the context of experimental psychology was philosophy, and that each field of study needed the other.

Wundt proposed a solution that would formalize the system that had been developing: every large university would have three chairs in philosophy, one each for systematics, history of philosophy, and experimental psychology; every small university would have at least an Extraordinarius qualified to give doctoral and state teachers' examinations, and who could satisfy candidates whose training emphasized experimental psychology. Although Wundt did not say so, this last arrangement was being tried already in Leipzig--Wundt had given his place on the examination board to the Extraordinarius Paul Barth in 1910.¹⁴⁸ Most German universities required Ordinarien for examinations; Wundt called for relaxation of that rule.

Nothing changed in direct response to the controversy in 1913. Wundt's view held sway. People had talked of a crisis in psychology when Münsterberg criticized Wundt in the 1890s, and differences between humanistic and experimental psychologists would precipitate talk of crisis again in the mid-

¹⁴⁷ Wundt, *Die Psychologie im Kampf ums Dasein* (Leipzig: Alfred Kröner, 1913), 31.

¹⁴⁸ Compare the listing of state examiners in Leipzig University's *Personalverzeichnis* for 1909 with the list for 1910.

1920s.¹⁴⁹ The institutional gains of experimental psychology were not swept away by the complaints of philosophers. Jaensch stayed at Marburg. The discussion did, however, reveal some problems with the existing arrangement for experimental psychology within philosophy. For some time there had been psychologists who were not interested in being philosophers; now there were also philosophers who considered themselves to have nothing whatsoever in common with psychologists. This had not been true before, even of Dilthey or Windelband. The Leipzig Institute, under Wundt's direction, was about the only place where all the threads of psychology and philosophy were still holding together. And Wundt was over eighty. In any case, the controversy of 1913 was soon overshadowed by the conflagration of 1914.

¹⁴⁹ Karl Bühler, *Die Krisis in der Psychologie*, (Jena: Fischer, 1927). Besides Ash's comments on this later "crisis," there is this general discussion of crises in psychology: Christina Fritsche, "Die Rolle Wilhelm Wundts in der Krise der bürgerlichen Psychologie," *Wissenschaftliche Zeitschrift der Karl-Marx-Universität Leipzig, Gesellschafts- und Sprachwissenschaftliche Reihe*, 29 (1980), 137-150.

Chapter IX

Epilogue and conclusion: Experimental psychology, psychology and philosophy.

A. The Great War and Wundt's retirement.

1. Effects of the war.

When Wundt informed his son that carpenters had begun work to expand the Institute's quarters into one of the new *Forschungsinstitute*, he expressed worry that the international situation might upset the plans. He also gave a vivid picture of the mood in Leipzig:

Here there is already downright enthusiasm for war. Tonight as the dispatch about the outbreak of the Serbian-Austrian war arrived, masses of people milled through the street singing "Die Wacht am Rhein" and "Deutschland, Deutschland über Alles" until 4 a.m.-- among them workers, as well. Only occasionally and timidly did hisses erupt from Social Democrats. In front of the house of the Austrian consul, who lives near us, ovations broke out, and some of the participants were students in traditional attire [in Wicks]. One has the distinct impression that a war breaking out now would be popular.

[Hier herrscht bereits förmliche Kriegsbegeisterung. Heute Nacht als die Depechen über den Ausbruch des serbisch-österreichischen Krieges eintrafen, zogen Volksmassen, die Wacht am Rhein und "Deutschland, Deutschland über Alles" singend bis 4 Uhr durch die Strassen, darunter sichtlich auch Arbeiter; nur schuchtern wagte sich gelegentlich die Zischen, von Sozialdemokraten herrührend, hervor. Vor dem Hause des in unserer Nähe wohnenden österreichischen Konsuls wurden Ovationen dargebracht, darunter befanden sich zum Teil Studenten in Wicks. Man hat geradezu den Eindruck, dass ein jetzt ausbrechender Krieg populär sein würde.]¹

Max reported that in Strassburg too, popular opinion favored war.² The very day Max wrote his letter-- August 1, 1914--Germany declared war on Russia. The Austro-Serbian conflict had become a World War.

As perhaps the Leipzig faculty's most distinguished, and certainly its oldest active member, Wundt delivered a public lecture September 10, "On the real war."³ He emphasized that cultural values were the main stake in the great conflict, a view that he reaffirmed by his signature on the "Declaration of the Professors" of October 23.⁴ The university was soon nearly emptied of young men, but with

¹ Wundt to Max Wundt, 26 July 1914, UAL, Wundt Nachlass, Nr. 1644.

² Max Wundt to Wundt, 1 August 1914, UAL, Wundt Nachlass, Nr. 1644-1.

³ Wundt, *Über den wahrhaften Krieg* (Leipzig: Kröner, 1914).

⁴ The context of this and similar declarations, and of the many writings on the cultural significance of the war, is discussed in Fritz Ringer, *The decline of the German mandarins: The German academic community, 1890-1933* (Cambridge, MA: Harvard U. Press, 1969), 180-199.

increased enrollment of women, the lectures continued.

The mobilization, surprisingly, did not cancel the expansion of the Institute. Construction stopped for a while, but then it resumed because the government wanted to relieve unemployment. Reporting this development to Institute Assistant Friedrich Sander, now an officer training troops for battle, Wundt estimated that the remodeling would take only one semester. "There is every reason to believe that when you return to us in the spring, you will find the entire Institute already in its new form." [Es ist also alle Ansicht vorhanden, dass Sie im Frühjahr, wenn Sie zu uns zurückkehren, das ganze Institut in seiner Neugestaltung bereits vorfinden werden.]⁵ Sander gave a patriotic interpretation of Wundt's news:

This is the best witness of the strength of our people, that it does not, even in the midst of war, forget to advance the work of peacetime. I hope to be allowed the experience to go back to work with fresh energy, in the new rooms and under your eyes. But for now I have other tasks before me.

[...das ist das schönste Zeugnis für die Stärke unseres Volkes, dass es auch mitten im Kriege nicht vergisst, Werke des Friedens zu fördern. Ich hoffe, erleben zu dürfen, in den neuen Räumen mit frischen Kräften unter Ihren Augen weiterarbeiten zu können. Doch vor dem sind mir noch andere Aufgaben gestellt.]⁶

Wundt's next progress report estimated that the construction would near completion over Christmas vacation. With only six people working in the Institute, however, Wundt hoped that Sander and the others would be finished with war by Easter and be back for the summer-semester of 1915.⁷

Of course they were not back by Easter; indeed others were gone by then, too. The Institute's expansion was complete in mid-March, just in time to lose even more of its members.⁸ Otto Klemm was taken with other older conscripts into the *Landsturm* that spring.

Still the work of the Institute and the university continued. With Institute Assistant Klemm gone, *Mittdirektor* Wirth set up demonstrations for Wundt's psychology lectures and took over Klemm's responsibilities in the Institute.⁹ From the army camp in Metz, Klemm expressed his gratitude to Wirth for tending to Wundt's needs, and to Wundt for employing Mrs. Klemm in the Institute library. His scheduled leave was canceled, so Klemm expected to go into battle soon. An unsteady handwriting

⁵ Wundt to Friedrich Sander, 1 October 1914, UAL, Wundt Nachlass, Nr. 1429a.

⁶ Friedrich Sander to Wundt, 14 November 1914, UAL, Wundt Nachlass, Nr. 1430.

⁷ Wundt to Friedrich Sander, 20 November 1914, UAL, Wundt Nachlass, Nr. 1430.1

⁸ Wundt to Friedrich Sander, 18 March 1915, UAL, Wundt Nachlass, Nr. 1430a1.

⁹ Wilhelm Wirth to Wundt, 20 April 1915, UAL, Wundt Nachlass, Nr. 948.

betrayed stress, and his words reveal an uncertainty until then absent in letters from the field to Wundt:

My entire earlier life has slipped into the far distance, and this distance increases each time a chance for peace disappears. Ahead I see no bridge at all which leads back to a peacetime now become mythical. ... This monstrous fate runs its course outside of all the categories that we normally apply to life.

[In wie weite Ferne ist mein ganzes früheres Leben gerückt, und wie steigert sich diese Abstand, wenn uns jede Aussicht auf einen Frieden entschwindet. Ich sehe gar keine Brücke vor mir, die von dem Kriege wieder zu dem sagenhaft gewordenen Frieden zurückführt. ... In dem jenseits aller Kategorien, die wir sonst an das Leben herantragen, spielt sich dieses ungeheure Schicksal ab.]¹⁰

In his next letter, Klemm seemed more settled. He had been promoted to junior officer with duties in telephoning and observation. The war in France had settled into *Stellungskrieg*, trench warfare. "It is so difficult to wait and to persevere, without being able to direct the will toward a particular goal." [Es ist so schwer, zu warten und auszuharren, ohne dass sich der Wille auf ein bestimmtes Ziel richten kann.]¹¹

By October of 1915, Klemm had joined the *Messabteilung*, which located enemy artillery and its movements using acoustical measurements. As the only one on the staff with formal training in acoustics, Klemm was responsible for the calculations.¹² He communicated to Wundt his ideas on improving acoustical location. While preparing an article in 1909,¹³ he had learned enough about differences between binocular vision and binaural hearing to realize that the apparatus used by the army, a design by Hornbostel and Wertheimer of Berlin, could not work well. It only enlarged the basis of hearing to four meters, whereas a basis on the order of one hundred meters was required to pinpoint origins of artillery sounds at battlefield distances. Klemm proposed to set up two microphones at a distance of one hundred meters and vary the location of one of them until sound arrived at both simultaneously. The perpendicular to the line between the microphones would give the direction of the enemy artillery, with an accuracy of one degree of arc. Asking Wundt to keep his secret, he described the apparatus in detail and suggested that Wirth might test it. Klemm hoped to work on it himself during his next leave, either in the Leipzig Institute or in the *Schallmessschule* at Kammersdorf near Berlin.¹⁴ Wundt secured the

¹⁰ Otto Klemm to Wundt, 6 July 1915, UAL, Wundt Nachlass, Nr. 260b.

¹¹ Otto Klemm to Wundt, 15 July 1915, UAL, Wundt Nachlass, Nr. 260c.

¹² Otto Klemm to Wundt, 4 October 1915, UAL, Wundt Nachlass, Nr. 261a.

¹³ Otto Klemm, "Lokalisation von Sinneseindrücken bei disparaten nebenreizungen," *Psychologische Studien*, 5 (1909/10), 73-162.

¹⁴ Otto Klemm to Wundt, [1916], UAL, Wundt Nachlass, Nr. 262.

Saxon Ministry's permission for Klemm to do the research in the Institute, but Klemm attained no leave until the summer of 1917--too late, presumably, to produce equipment for the war.¹⁵

Wundt's younger assistant, Sander, was wounded in the first weeks of the war, during the invasion of Belgium. His bravery in hand-to-hand combat won him the Prussian Iron Cross, but his recovery went badly. An attack of tuberculosis got him stationed on Lake Garda in Northern Italy for convalescence. Sander was eager to return to the field, but Wundt, referring to his own experience as a young Privatdozent, admonished him to recover fully before undergoing any more stress, for his own sake and for the future of psychological science.¹⁶

Although the war emptied the Institute of many vital personnel, it brought back August Kirschmann. For health reasons, Kirschmann had been on leave from Toronto University since 1909, and he was in Switzerland when the war broke out. Toronto officially discharged him on July 15, 1915; he was destitute, and his rich relatives in Freiburg would not help him. Külpe discovered Kirschmann's whereabouts and informed Wundt. Unable to employ him in Munich, Külpe inquired whether the new *Forschungsinstitut* in Leipzig had something like a "Carnegie-Stipendium" to support Kirschmann's work in experimental psychology.¹⁷ Wundt explained that the funds of the *Forschungsinstitut* could not be used for salaries, but that he would hire Kirschmann privately to help Wirth in the Institute.¹⁸

Kirschmann accepted Wundt's offer. He really had little choice: since Canada was at war with Germany, Toronto refused to pay his pension, and he could not even withdraw the money he had saved in a Canadian bank. Kirschmann feared that his research had been too specialized during the past twenty-three years for him to be of general use in the Institute, but he pledged to do his best. Mindful of the status that was denied him in his native country, Kirschmann requested that the catalogue of Leipzig University include next to his name these words: "previously Professor at the University of Toronto-Canada."¹⁹ Wundt granted the request and welcomed the help of one of his favorite students.

¹⁵ Wundt to KM, 26 July 1916, Staatsarchiv Dresden, Ministerium für Volksbildung, Nr. 10 281/322, Personalakte Prof. Wilhelm Wundt, Bl. 82. Wundt to KM, 2 August 1917, *ibid.*, Bl. 90.

¹⁶ Wundt to Friedrich Sander, 18 March 1915, UAL, Wundt Nachlass, Nr. 1430a1.

¹⁷ Oswald Külpe to Wundt, 26 September 1915, UAL, Wundt Nachlass, Nr. 430.

¹⁸ Wundt to Oswald Külpe, 9 October 1915, UAL, Wundt Nachlass, Nr. 431.

¹⁹ August Kirschmann to Wundt, 7 October 1915, UAL, Wundt Nachlass, Nr. 1278.

Kirschmann stayed in the Institute, was allowed to habilitate in 1918, and in 1923 was made *Honorarprofessor*. Throughout the 1920s he provided a link from the first generation of Leipzig psychologists to the second generation (Wirth, Krueger, Klemm, Sander) and the third (Krueger's students).

Wundt's other German students abroad stayed there. Overworking in his efforts to sway American opinion in the other direction, Münsterberg died of a stroke shortly before the United States entered the war on the side of the Allies. In Italy, Kiesow's position became uncomfortable once Italy reversed alliances in 1915 and declared war on Germany. In addition, illness with hepatitis and the housing of war refugees in his institute brought interruptions to his research. After the armistice Kiesow resumed his correspondence with Wundt: he survived the war with his career intact, with loyal students, and with eagerness to continue promoting experimental psychology in Italy.²⁰

It is difficult to think of a German experimental psychologist who actually died in battle, though the trenches, the mustard gas and the machine guns took a terrible toll, even among the educated young men of Europe. Institute Assistants Sander and Klemm returned, and so did Paul Kolbischek, the very capable custodian. Krueger, professor at Halle, served as an officer in the Prussian army on both the western and eastern fronts. His pet project was organizing educational services for soldiers in the field.²¹ In Munich Külpe was deprived of his assistants, Karl Bühler and Richard Pauli, who both worked in medical units. Gustav Kafka, who took his doctorate with Wundt before going to Munich, headed psychological services in the Austrian army toward the war's end. All of these soldiers returned to careers in psychology, but several other experimental psychologists fell victim, not directly to war but to the influenza and pneumonia that raged in those years.

Psychology's "peaceful losses" were significant, even staggering, and they had begun before the war. Ebbinghaus had died in 1908 after a very short illness. Wundt's assistant, Paul Salow, habilitated in 1911, got sick before his marriage in late 1912, and died early in 1913 on his honeymoon. A specialist in the theoretically crucial area of experiments on emotions, Wundt called him "the most imaginative and versatile of my assistants" [der ideenreichste und vielseitigste unter meinen Assistenten].²²

²⁰ Friedrich Kiesow to Wundt, 31 December 1919, UAL, Wundt Nachlass, Nr. 232.

²¹ Felix Krueger to Wundt, 26 October 1916, UAL, Wundt Nachlass, Nr. 383. Felix Krueger to Wundt, 6 April 1917, UAL, Wundt Nachlass, Nr. 383a.

²² Wundt to Max Wundt, 8 February 1913, UAL, Wundt Nachlass, Nr. 1643.

Sander replaced Salow only two semesters before the war started. Wundt's favorite among his non-psychologist students, Raoul Richter, died in 1912, at age forty-one. Added to the untimely death of these younger colleagues, Wundt's wife passed way in 1912 also, after an extended period of poor health.

The two leading members of the first generation of Leipzig psychologists both died in 1915, from flu and pneumonia. Meumann was first to go. Külpe wrote a critical piece on Meumann's aesthetics as a *Nachruf* article, and this contribution angered Meumann's friend, Gustav Störing. They were still arguing when Külpe, too, suddenly died.²³ In both Hamburg and Munich, experimentalists were found to replace these important psychologists: William Stern and Erich Becher, respectively. Some universities did not hire such replacements. Becher's successor in Münster was not an experimentalist. In Graz, Alexius Meinong lost his assistant, Stephan Witasek, to a malignant stomach disease in 1915, and experimental work there essentially ceased.²⁴ Experimental psychology continued, as before the war, gaining some and losing some.

As his students, colleagues, and his son continued fighting the war, old Wundt continued lecturing and writing. However, he managed to retire from Leipzig University before the belligerents retired from the battlefield.

2. Krueger as successor.

It is appropriate that Wundt wrote his final critical review of a work by the psychologist who succeeded him. Krueger's first book on *Völkerpsychologie* appeared shortly after the war began.²⁵ In it Krueger argued that "developmental psychology" [Entwicklungspsychologie] was more appropriate than Wundt's time-honored term: it included ethology and child psychology, which were current in psychological research. In the final volume of *Psychologische Studien*, Wundt rejected Krueger's term, and the reasons for using it.²⁶ Once more he defended his view that theoretical psychology consisted of

²³ Meumann died April 26, Külpe on December 30. Gustav Störing to Wundt, 1 May 1915, UAL, Wundt Nachlass, Nr. 1498. Gustav Störing to Wundt, 24 August 1915, UAL, Wundt Nachlass, Nr. 1499.

²⁴ "Alexius Meinong," in *Die deutsche Philosophie der Gegenwart in Selbstdarstellungen*, ed. Raymund Schmidt, vol. 1 (Leipzig: Felix Meiner, 1921), 91-150; 99-100.

²⁵ Felix Krueger, *Über Entwicklungspsychologie, ihre sachliche und geschichtliche Notwendigkeit (Arbeiten zur Entwicklungspsychologie, Bd. 1)* (Leipzig: Engelmann, 1915).

²⁶ Wundt, "Völkerpsychologie und Entwicklungspsychologie," *Psychologische Studien*, 10 (1916-18), 189-239.

an individual-experimental part and a social-historical part, the *Völkerpsychologie*. The biological approach still did not interest Wundt.

Writing from the eastern front, Krueger expressed disappointment at his teacher's severe criticism, but he was able to appreciate Wundt's criticism without backing down.

In my view general psychology is in no way limited to the consideration of 'fully developed' human individuals of a certain cultural level. It abstracts from the pre-history, as well as from the social conditions, of its objects. Such a procedure is necessary. But it must build with methodical consciousness upon a--also descriptively--much wider and surer foundation. I have found that this much is the justified core to be recognized in the efforts of the phenomenologists and others earnestly searching at the present time.

[Die allgemeine Psychologie ist m.E. keineswegs beschränkt auf die Betrachtung 'vollentwickelten' menschlichen Individuen einer bestimmten Culturstufe. Die abstrahiert von der Vorgeschichte wie von der sozialen Bedingtheit ihrer Objekte. Ein solches Verfahren ist notwendig. Aber es muss mit methodischem Bewusstsein, auf einen--auch deskriptiv--viel breiteren und gefestigteren Grundlage sich aufbauen. So viel, fand ich, ist als berechtigten Kern anzuerkennen an den Bestrebungen der Phänomenologen und anderer ernstlich Suchender in der Gegenwart.]²⁷

Krueger acknowledged that others besides Wundt had influenced his thinking:

I hope... that the differences that have come forth will be resolved to a great extent, once I go more deeply into the specific questions and in doing so go over your preparatory studies step by step. Cornelius and his teachers, including William James, have of course had a strong effect on me. But these influences have in recent years often and, I believe, usefully crossed with those of experimental psychology and, most especially, *Völkerpsychologie*.

[Auch ich hoffe..., die hervorgetretenen Gegensätze werden sich zu einem guten Teile lösen, wenn ich erst tiefer in die Einzelfragen hineinkommen, und dabei auf Schritt und Tritt Ihren Vorarbeiten begegne. Cornelius und seine Lehrmeister, darunter Will. James, haben allerdings stark auf mich gewirkt. Aber diese Einflüsse haben sich in den späteren Jahren vielfach und, wie ich glaube, nützlich mit denen der experim., besonders aber der *Völkerpsychologie* gekreuzt.]²⁸

This commitment to research in *Völkerpsychologie* probably influenced Wundt to make Krueger his successor in Leipzig.

Kirschmann, the consummate technical supporter of Wundt's theories, criticized Krueger and the "younger philosophers":

Instead of applying their energies to a part of the scientific, academic structure which is modest but really in need of research and capable of expansion, or testing the foundations for their firmness, they try immediately to rebuild the tower or the dome.

²⁷ Felix Krueger to Wundt, 16 October 1916, UAL, Wundt Nachlass, Nr. 383.

²⁸ Felix Krueger to Wundt, 24 November 1916, UAL, Wundt Nachlass, Nr. 383aa.

[...anstatt ihre Kräfte an einem bescheidene aber wirklich untersuchungsbedürftigen und erweiterungsfähigen Teil des wissenschaftlichen Lehrgebäudes anzusetzen, oder die Fundamente auf ihrer Sicherheit zu prüfen, gleich einen Umbau der Turmpyramide oder der Kuppel zu versuchen.]²⁹

Wundt, however, knew that his successor had to be someone who could meet the challenge of theoretical psychology, someone like Krueger and not like Kirschmann or Wirth.

A few months after their letters concerning Krueger's book, Krueger visited Leipzig during a military leave and came to an understanding with Wundt. Wundt tendered his letter of resignation in January 1917, effective the following October. He listed his reasons as advanced age (eighty-five!), near blindness, the physical hardship of getting to lectures, and his desire to complete scholarly projects--there were still four volumes of *Völkerpsychologie* to finish, as well as revisions of several other works.³⁰ From the field, Klemm reacted favorably to the news of Krueger's appointment and understood it to mean a smooth continuation of the Institute's work.³¹ Klemm had of course always enjoyed working with Krueger.

The transfer of the leadership of Leipzig psychology raised some problems, however. For one thing, a war was on, and Krueger was still an officer in the Prussian army. He had to seek release from duty. Something also had to be done about the long-suffering *Mitdirektor*, Wilhelm Wirth. Krueger and Wirth could scarcely work together as Wundt and Wirth had. Krueger explained this problem to the ministry, referring to Wundt's "firm conviction" that a continuation of this *Direktor-Mitdirektor* arrangement would result in "the worst conflicts" ['feste Ueberzeugung,' dass es andernfalls sehr bald zu den unliebsamsten Kräften vergeudenden Erörterungen, ja zu den 'schwersten Konflikten' kommen würde]. Since Wirth was "perhaps the top authority" in psychophysics, he should continue that work, but in his own separate laboratory.³²

The matter was settled in the terms of Krueger's *Berufung*. The *Institut für experimentelle Psychologie* and the associated *Forschungsinstitut für Psychologie* were both directed by Krueger, and Wirth would direct the *Psychophysisches Seminar*, a separate entity in a different location.³³ Even this

²⁹ August Kirschmann to Wundt, 18 September 1916, UAL, Wundt Nachlass; Nr. 1279.

³⁰ Wundt to Max Wundt, 2 January 1917, UAL, Wundt Nachlass, Nr. 1645.

³¹ Otto Klemm to Wundt, 2 June 1917, UAL, Wundt Nachlass, Nr. 263.

³² Felix Krueger to KM, 17 April 1917, UAL, Wundt Nachlass, Nr. 383c.

solution did not prevent squabbling over the division of apparatus.³⁴

Wundt had successfully formed and held together the various areas of psychological research during his forty-two years at Leipzig. After Meumann left for Hamburg in 1911, these areas even included experimental pedagogy, about which Wundt had had his doubts. The urgencies of wartime and his extreme old age forced Wundt finally to leave Leipzig psychology in the hands of two clashing personalities. When the controversy of 1913 had brought out hostility between experimental psychologists and other philosophers, Wundt had been the main voice for keeping experimental psychology together with general psychology, and both within philosophy. Now a split in psychology was institutionalized even in Leipzig.

Wundt died peacefully on August 31, 1920, a few weeks after his eighty-eighth birthday. Earlier that month he had signed the preface to his autobiography and seen the tenth and final volume of *Völkerpsychologie* to press. In his last years, Wundt's unmarried daughter Eleonore served as his faithful companion, housekeeper, nurse, secretary, and research assistant. She also collected his professional effects and correspondence from his friends and colleagues into the Wundt Archive and Museum that, now in possession of the Archive of Karl Marx University, forms the basis of this study.

In 1925 the educational ministry granted Krueger's request to change the name of the Institute for Experimental Psychology to "Institute for Psychology."³⁵ Krueger, with Klemm's help, developed a Leipzig school of *Ganzheitspsychologie*, often called the Leipzig Gestalt school, as distinguished from the better-known Gestalt psychologists based in Berlin. Wilhelm Wirth continued working on psychophysics in his own laboratory. Both he and Krueger retained titles as professors of philosophy.

Mitchell Ash and Ulfried Geuter find significance in the fact that psychology had no separate academic identity, especially in the years between the wars. The "institutional weakness" of psychology as a field in German university and professional life, they claim, contributed to the relative failure

³³ KM to Wilhelm Wirth, 25 June 1917, Staatsarchiv Dresden, Ministerium für Volksbildung, Nr. 10230/28, Das Psychophysische Seminar, 1917-1942, Bl. 1.

³⁴ Wilhelm Wirth to KM, 29 July 1917, *ibid.*, Bl. 2. Wilhelm Wirth to KM, 20 August 1917, *ibid.*, Bl. 3-5. KM to Wilhelm Wirth, 5 September 1917, *ibid.*, Bl. 7.

³⁵ Ministerium für Volksbildung to Felix Krueger, 22 June 1925, UAL, RA 979, Universitäts-Rentamt, Psychologisches Institut, Bl. 55.

of the next general theoretical framework for German psychology in Germany after Wundt, that of the Gestalt school,³⁶ as well as to the unfortunate circumstances of the professional organization of psychologists in the service of National Socialism.³⁷ These studies raise important issues for history of twentieth-century psychology, but the question remains open whether an earlier separation of university psychology from philosophy (presumably giving "institutional strength" to psychology) could have changed very much for German psychologists in the 1920s through the 1940s.

Even after the defeat of the Nazis, psychology's relationship to philosophy still raises questions, especially about the role of theoretical psychology. Again Mitchell Ash:

Psychology's advance to sustained institutional growth in Germany did not occur until the 1950's, and then only within the framework of different social and economic circumstances, among them the increasing importance of training programs for professional psychologists. This last point leads to a haunting question: was Wundt right when he predicted that the separation of psychology from philosophy would inevitably lead to a time when psychologists would become 'artisans, but not exactly artisans of the most useful sort'? Such questions are not for historians to answer: for psychologists, however, they may provide food for thought.³⁸

Could psychology have been organized as a separate discipline with its own theoretical, as well as methodological, foundation? Was it possible to have a unified theory of psychology other than Wundt's, which was part and parcel of his philosophy? The historian cannot answer these questions either, but can only review the developments as they arose and try to describe their context.

B. A new science, an outworn philosophy of science, a bygone philosophy.

Mitchell Ash has strong historical grounds on which to criticize psychologist-historians and sociologists of science who have characterized the emergence of experimental psychology as, in essence, the liberation of psychology from philosophy.³⁹ Such a view certainly has little basis in institutional history, and it is also hard to defend in terms of the intellectual context of the time. Experimental psychology

³⁶ Mitchell G. Ash, "Gestalt psychology: Origins in Germany and reception in the United States," in *Points of view in the modern history of psychology*, ed. Claude E. Buxton (Orlando: Academic Press, 1985), 295-344.

³⁷ Ulfried Geuter, *Die Professionalisierung der deutschen Psychologie im Nationalsozialismus* (Frankfurt am Main: Suhrkamp, 1984).

³⁸ Mitchell G. Ash, "Wilhelm Wundt and Oswald Külpe on the institutional status of psychology: An academic controversy in historical context," in *Wundt studies, a centennial collection*, eds. Wolfgang G. Bringmann and Ryan D. Tweney (Toronto: Hogrefe, 1980), 396-421; 417-418.

³⁹ Mitchell G. Ash, "Academic politics in the history of science: Experimental psychology in Germany, 1879-1941," *Central European history*, 13 (1980), 255-286.

was first developed and practiced by certain philosophers in German universities in the late nineteenth century, and they generally remained committed to this arrangement well into the twentieth.

Although historical revision of the heroic story is justified, it would nevertheless be a mistake to overlook the important fact that something new and significant did indeed emerge. Edwin Boring was correct in stating that the field of psychology acquired a distinctly scientific identity with the rise of the psychological laboratory.⁴⁰ The fact that this identity for several decades remained firmly entrenched in German philosophy, both institutionally and conceptually, does not mean that it was not distinct. A philosophy of science commonly accepted in mid-nineteenth-century Germany allowed that experimental psychology might contribute to general philosophy. That field of philosophy was simply not the same field a few decades later.

In the transition of his career from physiologist to philosopher (Chapter Two) and in the establishment of the Leipzig Institute and its research program (Chapters Three and Four), Wundt's actions were guided by the intention to develop experimental psychology as a scientific basis for philosophy and so for all *Geisteswissenschaften*. From the time of his first writings on psychology in the 1860s, Wundt claimed that "scientific psychology" required two complementary approaches: the experimental study of individual psychological phenomena and empirical *Völkerpsychologie*, which would investigate the psychological phenomena that arise through social-cultural developments. From the early 1860s to the 1890s, Wundt's training best equipped him for the first line of attack. Later, perhaps too late, he concentrated his personal research on the second approach. Experimental psychology became Wundt's trademark, but for him it had always been only part of "scientific psychology." Because it employed methods of natural science, Wundt's experimental psychology was falsely interpreted by his American followers, and eventually also by some Germans, as something other than philosophy.

Wundt's laboratory enterprise spread in Germany and abroad (Chapters Five and Six), and his students were self-conscious of their identities as psychologists—even the Germans, who were professors of philosophy like Wundt. In America, psychology was professionalized and given its own departments in many universities before the turn of the century. In German-speaking universities, the steady but more

⁴⁰ Edwin G. Boring. *A history of experimental psychology*. 2nd ed. (NY: Appleton-Century-Crofts, 1950).

uneven growth of the new psychology was sufficient to raise alarm among non-experimenting philosophers shortly before World War I (Chapters Seven and Eight).

The explanation of the success of experimental psychology need not be too complicated. There was the visible example of Wundt in Leipzig, with his large Institute and his prestige in that major university. There was also the dynamic of experimental research, especially of the form it took in Wundt's program.

Wundt was able to use opportunities in Leipzig University, some of them unique to that institution during the mid-1870s, to promote the line of research that he had been developing for a decade. Just before Wundt arrived, Leipzig experienced an acute need for a distinguished philosopher to teach and to sit for examinations. Failing to find precisely such a person, the University settled for a mature academic man who had recently become a philosopher--Wundt--and a maturing philosopher of a more traditional description, Max Heinze. Leipzig luminaries such as E.H. Weber, Fechner, and Zöllner--natural scientists with strongly philosophical interests--looked favorably upon Wundt's research. Moreover, the other philosophers in Leipzig, Drobisch and Strümpell, also specialized in psychology, though the more established Herbartian type. These faculty members comfortably equated the domains of natural science and philosophy, and they supported Wundt's appointment. They did not, however, simply give him an institute. To attain that, Wundt had to work hard and put to good use what he had learned about academic politics and scientific laboratories during his early career in Heidelberg.

Even if, as Ben-David and Collins note, German philosophy in the 1860s and 1870s paled in comparison to its earlier glory in the years from Kant to Hegel,⁴¹ students still had to pass examinations in philosophy to qualify as teachers in secondary schools. That requirement afforded professors of philosophy importance and, Mitchell Ash contends, even power and prestige in the university. Wundt's experimental approach to psychology immediately appealed to future teachers of mathematics and natural science; it also attracted students of philosophy interested in scientific method. In fact, the latter soon outnumbered the former. Huge enrollments in Wundt's lectures gave him justification for seeking more

⁴¹ Joseph Ben-David and Randall Collins, "Social factors in the origins of a new science: The case of psychology," *American sociological review*, 31 (1966), 451-465.

funding for experimental research. Serving in administrative capacities, he gained a better understanding of the requirements for sustained financial support within the framework of the university. Using the Prussian offer of a professorship in Breslau in 1883, Wundt bargained to secure the establishment of the Institute for Experimental Psychology at Leipzig University.

Wundt's institutional achievements are much better known than his conceptual ones, which were, nevertheless, certainly as important in their time. The institutional and intellectual aspects of Wundt's work were connected in that his theory of mind almost compelled experimentation on a large scale. The features of Wundt's theory that are relevant to psychological experimentation can be characterized as follows: analysis of psychic processes into distinct mental actions on psychic elements (sense perceptions and "feelings"), the five-stage model for reaction to sensory stimulation (the apperception studies, especially in the early years), and the relation of volition to bodily correlates of "feelings" (the studies of emotions, a focus of Leipzig experiments after 1890). Wundt defined a strict methodology for the psychological experiment: highly trained self-observation [Selbstbeobachtung], controlled by objective measurements of times or intensities of reaction correlates.

Wundt proposed the theories, and then the experiments to test them. As Kurt Danziger puts it, his philosophy of science was more deductive than inductive.⁴² Significantly, his theoretical formulations were flexible enough to allow some modification in response to results of experiments--thus the occasional changes which sometimes drove Wundt's more exacting critics to distraction.

Wundt's theory demanded that experimentation should focus on mental processes, which for Wundt were the essential concern of the psychologist. His Institute frequently investigated related physiological and psychophysical problems, but sensory physiology was still studied in physiological institutes, and physiologists and physicists, as well as experimental psychologists, used psychophysical methods. The overlap of research among these disciplines, and some experimentalists' rejection of Wundt's theories of mental action, engendered disagreement over what exactly experimental psychology could do.

⁴² Kurt Danziger, "Wundt's psychological experiment in the light of his philosophy of science," *Psychological review*, 42 (1980), 109-122.

Wundt's apperceptionist psychology seems strange in the late twentieth century, and it had its critics among experimental psychologists of his own time. The first ones tended to work on one kind of problem (e.g., G.E. Müller on psychophysics) or even on one particular sense (e.g., Stumpf on acoustics). Wundt's ambitious program for experimentation on a wide range of psychological problems not only engaged the numerous researchers in his Institute; it also presented many topics for the consideration of a generation of younger critics--people such as Münsterberg, Schumann, and Marbe. In this sense, Wundt set the agenda even for experimental psychologists who disagreed with him.

Wundt's identity as father of modern psychology is clear, even though psychology's identity as a separate field is not. Mitchell Ash has made an issue of the institutional insecurity of psychology, especially as it was forced to share the vicissitudes of general philosophy during the intellectual, political, social and economic turmoil of twentieth-century Germany. Certainly, an added insecurity during that period could be devastating. Still, it is hard to imagine how psychology might have become a separate academic discipline in Germany before World War I. Only Wundt had a general theory of psychology, and he counted it as part of his philosophy. Those with more modern philosophical views tended to discount the possibility of a general theory of psychology.

Internally, the very success of Wundt's experimental approach complicated his unified picture of psychology. By the turn of the century, experimentalists were producing more research reports than Wundt alone could criticize and synthesize into his theoretical framework in revised editions of *Grundzüge der physiologischen Psychologie*, his handbook for experimental psychology.

Laboratory psychology had rapidly spread beyond the borders of Germany, at a time when science was still tacitly (and therefore truly) international and German universities still led many areas of scientific research. In the 1890s, however, natural scientists increasingly identified with their national traditions, and this identification was even more pronounced in philosophical disciplines.

The last decade of the nineteenth century witnessed the rise of a new political nationalism and a new philosophical positivism in Europe. In exile in Switzerland, the perceptive Lenin critiqued both nationalist imperialism and the philosophy of Mach and Avenarius.⁴³ These philosophers of

⁴³ For a Marxist perspective on Wundt's career: Wolfram Meischner and Erhard Eschler, *Wilhelm Wundt* (Leipzig: Urania, 1979).

empiricrism may have intended to give science a firmer epistemological foundation, but their effect was to make general theories very difficult to develop and to support. The "technicians" concentrated on discrete problems without reference to systematic explanations of broad classes of phenomena. (This latter style had been the hallmark of numerous great achievements in German science during the nineteenth century.) Younger psychologists accepted a phenomenological approach which had no pretension to general theories, and they considered Wundt's deductive philosophy of science to be an excuse for an old man's dogmatism. These intellectual trends brought about the dissolution of the fruitful marriage of German idealism (which retained both rational and empirical concepts of mind) and the Comtean spirit (which looked forward to the unfolding of progressively more complex branches of science). Partly in reaction to the new positivism, German idealism turned into German nationalism, and intellectuals lost confidence in the ability of science to provide any solutions to the important questions of the day.

Wundt himself was secure enough--and stubborn enough--to adhere to his old-fashioned views, but other experimental psychologists changed with the times. Wundt's first important student, the liberal-minded Külpe, was open to both the Machian and the phenomenological movements. Meumann tried not to violate the boundaries of Wundt's theories, but this avoidance drove him to applications of psychology to pedagogy, and away from the theoretical work which was so important to Wundt. As Wundt coached his students in their academic careers, he constantly complained about "technicians": it bothered him that in Germany people such as Schumann and Marbe, with no agenda to develop general theories and intent on destroying his own, should become professors of philosophy. When the non-experimenting philosophers lobbied for the exclusion of experimental psychologists from chairs in philosophy, Wundt resisted the change. The experimentalists who were not philosophers were, in his estimation, also not really psychologists. Wundt would not defend them, but he did warn the hostile philosophers that a separation of experimental psychology from philosophy would create more such "technicians" or "artisans."

Wundt remained a leader of psychology as long as he could, into his eighties during the First World War. To solve the problem of his successorship in Leipzig, he finally settled on Krueger, who

took a general approach to psychology and strongly emphasized the *Völkerpsychologie* side of Wundt's program. In this solution, however, Wundt had to accept the banning from the Institute of a type of technical research that had been traditional there: Krueger would not work together with the psychophysicist Wirth, Wundt's main assistant since 1900. After Wundt's death, there was no one in Germany, and certainly no one anywhere else, who could support his broad program for scientific psychology. In our turbulent century, practical applications were needed, and the specialist had more authority, the generalist less. The optimistic, nineteenth-century view of science, which had promised even a science of mind, was gone. Still, it had given birth to a community of practitioners, if not a paradigm.

APPENDIX I:

Personnel of the Institute for Experimental Psychology, Leipzig, 1883-1918

	Assistant	Assistant	Famulus†
WS 83			c.math. Gustav Lorenz
SS 84			
WS			c.math. Carl Lorenz
SS 85			
WS	c.ph. James Cattell		
SS 86			
WS	D.ph. Ludwig Lange		
SS 87			
WS	D.ph. Oswald Külpe		st.math. Alfred Vierkandt
SS 88			
WS			st.rer.nat. August Kirschmann
SS 89	(Pd. Külpe)		
WS			
SS 90			
WS			
SS 91			
WS		D.ph. Kirschmann‡	st.paed. Paul Krüger
SS 92			st.paed. Friedrich Kiesow
WS		D.ph. Ernst Meumann‡	
SS 93			
WS			
SS 94	(Prof. Külpe)		
WS	Pd. Ernst Meumann	D.ph. Kiesow*	<i>Famulus no longer listed</i>
SS 95			
WS			
SS 96		D.ph. Paul Mentz*	
WS			
SS 97			
WS	D.ph. Paul Mentz	c.math. Erich Mosch*	
SS 98			
WS	(Pd. Mentz)	D.ph. Wolfgang Möbius*	
SS 99			

† A student assistant.

‡ *Privatassistent*, paid privately by Wundt.

* Second Assistant, with official salary (First Assistant in first column).

SOURCE: *Personalverzeichnis der Universität Leipzig, 1883-1918.*

	Assistant	Assistant	Other
WS 99	D.ph. Robert Müller	(D.ph. Möbius)	
SS 00		D.ph. Wilhelm Wirth†	
WS		(Pd. Wirth)	
SS 01	Pd. Wirth	c.ph. Ernst Dürr†	
WS			
SS 02		(D.ph. Dürr)	
WS	Pd. Wirth‡	D.ph. Felix Krueger‡	
SS 03		(Pd. Krueger)	
WS			
SS 04			
WS			
SS 05			
WS			
SS 06	(Prof. Wirth)	D.ph. Otto Klemm	
WS			
SS 07			
WS			
SS 08			
WS	D.ph. Paul Salow		Prof. Wirth*
SS 09		(Pd. Klemm)	
WS			
SS 10			
WS			
SS 11	(Pd. Salow)		Pd. Max Brahn+
WS			
SS 12			Prof. Ottmar Dittrich††
WS			
SS 13	Johannes Handrick		D.ph. Walter Moede‡‡
WS	D.ph. Friedrich Sander		
SS 14			D.ph. Hermann Damm‡‡
WS			
SS 15			D.ph. August Kirschmann**
WS			
SS 16			
WS			
SS 17			
WS			Wundt retires

† Second Assistant (First Assistant in first column).

‡ Assistants--no distinction between First and Second, from 1902 on.

* *Mitdirektor*--Wirth keeps this title until Wundt's retirement, 1917.

+ *Abteilungsvorstand für experimentelle Pädagogik*.

†† Starting WS 1912/13, the Institute had departments, each with its leader:

Wirth *Mitdirektor u. Abteilungsvorstand für Psychophysik.*

Dittrich *Abteilungsvorst. f. exp. Phonetik u. Sprachwissenschaften, until SS 1916.*

Klemm *Assistent u. Abteilungsvorst. f. Psychologie der Sinneswahrnehmung.*

Salow *Assistent u. Abteilungsvorst. f. Psych. d. emotionalen Funktionen.*

Brahn *Abteilungsvorst. f. experimentelle Pädagogik.*

‡‡ Assistant to Max Brahn.

** *Privatassistent*, paid privately by Wundt.

APPENDIX II:

**Experimental psychologists as German professors of philosophy,
1873-1920**

The following tables show German experimental psychologists in their context as professors of philosophy in Prussian, non-Prussian German, Swiss and Austrian universities. For details on a particular person, see Appendix III.

In most of these universities, an experimental psychologist occupied one full professorship at some time during this period. Exceptional universities are so noted in the column heading, e.g. Leipzig (2), Vienna (0).

CAPITAL LETTERS denote Professor Ordinarius, a full professorship. Other entries (experimental psychologists only) are Privatdozenten or Extraordinarien.

The full professors listed are not all experimental psychologists. To see which full professors participated in laboratory work, look at the bottom of each column, where the sequence of chair-holding psychologists (sometimes with interruption) is given.

Italics denote an experimental psychologist who studied in Wundt's Institute, either officially or as a visitor.

An arrow indicates that the entry belongs in a position, above or below, that is already occupied. In other words, both people changed status in that same year.

A few relevant professors and institutions do not appear in the tables:

1906	<i>Dürr</i>	Universität Bern
1907	<i>DÜRR</i>	"
1906	<i>Hellpach</i>	Technische Hochschule Karlsruhe (psych.)
1920	<i>HELLPACH</i>	"
1918	BÜHLER	Technische Hochschule Dresden (phil. & pedagogy)
1919	KATZ	Universität Rostock (psych. & pedagogy)
1919	Moede	Technische Hochschule Berlin (Industrielle Psychotechnik)

German universities with no experimental psychologist teaching in this period: Erlangen, Greifswald, Heidelberg, Jena, Tübingen.

Prussian Universities:

	Berlin	Bonn	Breslau	Göttingen	Halle
1873	ZELLER (72-)	MEYER (68-)	DILTHEY (71-)	LOTZE (44-)	ULRICI(61-)
1874					
1875					
1876	Erdmann			G. Müller	
1877		T. Lipps			
1878					
1879					
1880	Ebbinghaus				
1881	LOTZE			G. MÜLLER	
1882					
1883					
1884	DILTHEY		ERDMANN		STUMPF
1885		<i>Marius</i>			
1886					
1887					
1888					
1889					
1890			T. LIPPS		ERDMANN
1891					
1892				Schumann	
1893					
1894	STUMPF		EBBINGHAUS		VAIHINGER
1895	Schumann↑				
1896					
1897			Stem		
1898		ERDMANN			RIEHL
1899					
1900					
1901					
1902				Ach	
1903					
1904				<i>Aall</i>	
1905	RIEHL				EBBINGHAUS
1906	Ach		KÜHNEMANN	HUSSERL	
1907		Becher	Hönigswald↑		BUSSE
1908			Stem		MENZER
1909	ERDMANN	KÜLPE			MEUMANN
1910	Rupp↑	Bühler↑			KRUEGER
1911				Katz	
1912					Jaensch
1913					
1914		STÖRRING			
1915					
1916					
1917	Hombostel				ZIEHEN
1918	Wertheimer				
1919	SPRANGER↓		HÖNIGSWALD		
1920	DESSOIR				
	Stumpf	Erdmann <i>Külpe</i> <i>Störing</i>	Erdmann T. Lipps Ebbinghaus - Hönigswald	G. Müller	Stumpf, Erdmann Riehl, Ebbinghaus <i>Meumann, Krueger</i> Ziehen

Prussian Universities:

	Kiel	Königsberg	Marburg	Münster	Giessen	Frankfurt
1873			LANGE (72-)			
1874						
1875						
1876			COHEN			
1877						
1878	Erdmann					
1879	ERDMANN					
1880						
1881						
1882						
1883						
1884						
1885						
1886						
1887						
1888						
1889						
1890						
1891						
1892			NATORP			
1893						
1894						
1895						
1896	RIEHL					
1897						
1898	MARTIUS	BUSSE			Messer	
1899						
1900						
1901					GROOS	
1902				ADICKES		
1903						
1904			Ach	BUSSE		
1905		MEUMANN				MARBE
1906						
1907		ACH		MEUMANN		
1908						
1909				BECHER		SCHUMANN↓
1910					MESSER	CORNELIUS
1911					Koffka	Köhler
1912						Wertheimer
1913			JAENSCH			
1914						
1915						
1916				ETTLINGER		
1917						
1918						
1919						
1920						
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
	Marius	Meumann Ach	Jaensch	Meumann Becher	Messer	Marbe Schumann

Non-Prussian German Universities:

	Leipzig (2)	Würzburg	Munich	Freiburg	Strassburg	Hamburg
1873	MASIUS (66-)	STUMPF				
1874						
1875	WUNDT					
1876						
1877				WINDELBAND		
1878						
1879						
1880						
1881						
1882				RIEHL	WINDELBAND	
1883						
1884						
1885						
1886					ZIEGLER	
1887				Münsterberg		
1888	Külpe					
1889		VOLKELT	STUMPF			
1890						
1891						
1892						
1893						
1894	VOLKELT	KÜLPE	T. LIPPS			
1895	Meumann↑					
1896	Störing	Marbe		RICKERT		
1897				Cohn		
1898						
1899	Mentz					
1900	Wirth					
1901						
1902	Brahn					
1903	Krueger	Dürr				
1904	Dittrich					
1905	F. Lipps↑					
1906						
1907		Bühler				
1908	Klemm					
1909		MARBE				
1910	MEUMANN		Kafka		Jaensch	
1911	Salow				STÖRRING	MEUMANN
1912	SPRANGER		Bühler↓			
1913			KÜLPE			
1914			Pauli			
1915						
1916			BECHER	HUSSERL		STERN
1917	KRUEGER					
1918	Kirschmann		FISCHER			
1919				COHN		CASSIRER
1920						
<hr/>						
	Wundt	Külpe	Stumpf	Cohn	Störing	Meumann
	Krueger	Marbe	T. Lipps			Stem
	Meumann		Külpe			
			Becher			

Swiss and Austrian Universities:

	Zürich	Vienna (0)	Prague (0)	Graz	Innsbruck
1873			VOLKMANN (61-)		
1874	WUNDT	BRENTANO			
1875					
1876	WINDELBAND				
1877	AVENARIUS				
1878		Meinong		RIEHL	
1879			STUMPF		
1880		Brentano	MARTY		
1881					
1882				Meinong	
1883					
1884					
1885			JODL		
1886					
1887					
1888					
1889				MEINONG	
1890					
1891					
1892		Hillebrand			
1893					
1894					
1895		MACH			
1896		JODL↑			HILLEBRAND
1897	Meumann				
1898					
1899			EHRENFELS		
1900	MEUMANN			Witasek	
1901	Wreschner↑				
1902	STÖRRING				
1903			HÖFLER		
1904					
1905	SCHUMANN			Benussi	
1906					
1907		HÖFLER			
1908					
1909					
1910					
1911	F. LIPPS				
1912	FREYTAG↑				
1913					
1914					
1915					
1916					
1917					
1918					
1919					
1920					

Wundt

Meumann

Schumann

Störring (1 yr.)

F. Lipps

Meinong

Hillebrand

APPENDIX III:
Persons Relevant to German Experimental Psychology,
1875-1914.

Abbreviations used:

stud.	studied, officially enrolled or not, before or after degree
D.ph.	Dr.phil., German doctorate from Philosophical Faculty
D.med.	Dr.med., German doctorate from Medical Faculty
A.B., B.A.	American or British degrees
A.M., M.A.	"
Ph.D., M.D.	"
teach.	tutor or teacher in secondary school
Instr.	Instructor, generally American
Lec.	Lecturer, generally non-German
Read.	Reader, British university
P.asst.	Assistant professor, American
P.assoc.	Associate professor, American
P.	Professor, full professor (occasionally unspecified rank)
T.H.	Technische Hochschule, German technical university, sometimes T.U.
habil.	habilitated and teaching as Privatdozent in a German university
P.Ext.	Professor Extraordinarius (salaried or not), German system
P.H.	Professor Honorarius, special rank between P.Ext. and P.O.
P.O.	Professor Ordinarius, German full professor
Asst.	institute assistant, generally with doctorate
Fam.	Famulus, student assistant
Rect.	Rector of a university
Pres.	President of a university
Dir.	Director of an institute
ret.	retired, at least from full-time status; ca. 1933, these were often dismissals by the Nazis
succ.	successor to (person specified)
§	denotes experimental psychologist with any faculty position in a German-speaking university

When several given names are listed, the one in *Italics* is the name used for publications, in the cases where the first given name is not so used.

If no subject is listed with a position or degree, assume philosophy. Occasionally this means "philosophy and pedagogy" or "philosophy and psychology."

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SAALL, Anathon (1867-1943)

	stud.	Christiana (Oslo)
1900	stud.	Berlin (Stumpf, Schumann)
1904	habil.	Halle
	stud.	Leipzig (Wundt, Krueger)
1908	P.	Christiana (Oslo)

SACH, Narziss Kasper (1871-1946)

1895	D.med.	Würzburg
1902	D.ph.	Göttingen (G. E. Müller)
1902	habil.	"
1904	"	Marburg
1906	P.Ext.	Berlin (Asst. to Stumpf, 1 semester)
1907	P.O.	Königsberg
1922	"	Göttingen
1937	ret.	

ADICKES, Erich (1866-1928)

	stud.	Tübingen
1885	stud.	Berlin
1887	D.ph.	"
	teach.	
1895	habil.	Kiel
1898	P.Ext.	"
1902	P.O.	Münster
1904	"	Tübingen (succ. Sigwart)

ANGELL, Frank (1857-1939)

1891	D.ph.	Leipzig (Wundt)
1891	P.asst.	Cornell (psych.)
1892	P.	Stanford (psych.)
1922	ret.	

ANGELL, James Rowland (1869-1949)

1892	M.S.	Harvard
1893	stud.	Berlin, Halle (Erdmann)
1893	Instr.	Minnesota (phil.)
1894	P.asst.	Chicago (psych.)
1901	P.assoc.	" "
1904	P.	" "
1921	Pres.	Yale
1937	ret.	

AVENARIUS, Richard Heinrich Ludwig (1843-1896)

	stud.	Zürich, Berlin, Leipzig
1868	D.ph.	Leipzig
1876	habil.	"
1877	P.O.	Zürich

BAEUMKER, Clemens (1853-1924)

1873	stud.	Münster
1877	D.ph.	"
1883	P.O.	Breslau (Catholic chair in phil.)
1900	"	Bonn
1903	"	Strassburg (succ. Windelband)
1912	"	Munich (succ. Hertling)

BAIN, Alexander (1818-1903)

1840	M.A.	Marischal College
1860	P.	Aberdeen (logic)
1882	Rect.	"
1886	ret.	

BALDWIN, James Mark (1861-1934)

1884	A.B.	Princeton
1884	stud.	Leipzig, Berlin
1887	A.M.	Princeton
1887	P.	Lake Forest College (phil.)
1889	Ph.D.	Princeton
1890	P.	Toronto (phil.)
1893	"	Princeton (psych.)
1903	"	Johns Hopkins (phil. & psych.)
1910	"	Mexico National University
1919	"	École Hautes Études Sociales, Paris
1924	ret.	

BARTH, Ernst Emil *Paul* (1858-1922)

1874	stud.	Breslau
1876	"	Leipzig (Heinze, Wundt)
1882	teach.	
1888	stud.	Leipzig
1890	habil.	"
1897	P.Ext.	Leipzig (phil. & pedagogy)
1918	P.H.	" "

BECHER, Erich (1882-1929)

1901	stud.	Bonn
1904	D.ph.	Bonn (Erdmann)
1907	habil.	Bonn
1909	P.O.	Münster (succ. Meumann)
1916	"	Munich (succ. Külpe)

BEKHTEREV, Vladimir Mikhailovich (1857-1927)

1881	M.D.	St. Petersburg Academy
1884	stud.	Paris (Charcot), Leipzig (Flechsig, Wundt)
1885	P.	Kazan (psychiatry)
1894	"	St. Petersburg Academy (psychiatry)
1913	Dir.	St. Petersburg Psychoneurological Inst.
1918	"	Petrograd Brain Research Inst.

SBENUSSI, Vittorio (1878-1928)

1902	D.ph.	Graz (Meinong)
1905	habil.	" "
1918	P.Ext.	Padua (exp. psych.)
1922	P.O.	" "

BERNHEIM, Hippolyte (1840-1919)

1867	D.med.	Strasbourg
1868	Lec.	"
1872	P.	Nancy
1882	ret.	

BERNSTEIN, Julius (1839-1917)

1862	D.med.	Berlin (Du Bois-Reymond)
1864	habil.	Heidelberg (Asst. to Helmholtz)
1868	P.Ext.	Heidelberg (physiology)
1871	"	Berlin "
1872	P.O.	Halle (physiology)

BINET, Alfred (1857-1911)

1878		Lycée St. Louis, Paris (law degree)
1894	D.sc.	Paris
1895	Dir.	Lab. Phys. Psych. Sorbonne (succ. Beaunis)

BORING, Edwin Garrigues (1886-1968)

1914	Ph.D.	Cornell (Titchener)
1919	P.	Clark (exp. psych.)
1922	P.assoc.	Harvard (psych.)
1928	P.	" "
1956	ret.	

SBRAHN, Max (?-?)

	stud.	Leipzig (Wundt)
1902	habil.	Leipzig
1911	Asst.	Leipzig Inst. Exp. Psych. Abteilung für exp. Pädagogik
1926	ret.	

BRENTANO, Franz (1838-1917)

1856	stud.	Munich, Würzburg, Berlin, Münster
1864	D.ph.	Tübingen
1866	habil.	Würzburg
1872	P.Ext.	"
1874	P.O.	Vienna
1880	habil.	Vienna (demoted due to marriage)
1894	ret.	

SBÜHLER, Karl (1879-1963)

1903	D.med.	Freiburg
1904	D.ph.	Strassburg
1906	stud.	Berlin (Stumpf)
1907	habil.	Würzburg (Asst. to Külpe)
1909	"	Bonn
1913	"	Munich
1916	P.Ext.	Munich
1918	P.O.	T.H. Dresden
1922	"	Vienna
1939	P.	Scholastic College (Duluth, MN)
1940	P.	St. Thomas College (St. Paul, MN)
1945	P.	U. Southern California
1955	ret.	

BUSSE, Carl Heinrich August *Ludwig* (1862-1907)

	stud.	Leipzig, Innsbruck
	"	Berlin (Dilthey, Ebbinghaus)
1885	D.ph.	Berlin
1887	P.	Tokyo (lectured in English)
1892	habil.	Marburg
1896	P.O.	Rostock
1898	"	Königsberg
1904	"	Münster
1907	"	Halle

CARSTANJEN, Friedrich (1864-1925)

1896	habil.	Zürich
1898	ret.	

CASSIRER, Ernst Alfred (1874-1945)

1899	D.ph.	Marburg (Cohen)
1906	habil.	Berlin (Dilthey)
1919	P.O.	Hamburg (succ. Meumann)
1933		Oxford (guest prof.)
1935	P.	Göteborg (Sweden)
1944		Columbia (guest prof.)

CATTELL, James McKeen (1860-1944)

1880	A.B.	Lafayette College
1880	stud.	Göttingen, Leipzig, Paris, Geneva
1882	"	Johns Hopkins (fellowship with Hall)
1883	A.M.	Lafayette College
1883	stud.	Leipzig
1885	Asst.	Leipzig (Wundt) 2 semesters
1886	D.ph.	Leipzig (Wundt)
1887	Lec.	Pennsylvania, Bryn Mawr
1888	stud.	Cambridge
1888	P.	Pennsylvania
1891	"	Columbia
1917	ret.	

CHARCOT, Jean-Martin (1825-1893)

1853	D.med.	Paris
1860	Lec.	Paris
1862		Salpêtrière (senior physician)
1872	P.	Paris Faculty of Medicine
1882	"	Salpêtrière

COHEN, Hermann (1842-1918)

1861	stud.	Breslau, Berlin
1865	D.ph.	Halle
1873	habil.	Marburg (F.A. Lange)
1875	P.Ext.	Marburg
1876	P.O.	Marburg (succ. F.A. Lange)
1912	ret.	

SCOHN, Jonas (1869-1947)

1888	stud.	Leipzig, Berlin, Heidelberg
1892	D.ph.	Berlin (botany)
1892	stud.	Leipzig (Wundt)
1897	habil.	Freiburg
1901	P.Ext.	"
1919	P.O.	"
1933	ret.	

CORNELIUS, Wilhelm *Hans* (1863-1947)

1880	stud.	Munich, Berlin, Leipzig
1886	D.ph.	Munich (chemistry)
1894	habil.	Munich (philosophy, Stumpf)
1903	P.Ext.	"
1910	P.O.	Frankfurt Academy (University as of 1914)

DAMM, Hermann Georg (1887-?)

1906	teach.	
1910	stud.	Leipzig
1914	D.ph.	Leipzig
1914	Asst.	Leipzig (Brahm)

DELABARRE, Edmund Burke (1863-1945)

1882	stud.	Brown
1886	A.B.	Amherst
1887	stud.	Berlin
1889	A.M.	Harvard
1891	D.ph.	Freiburg (Münsterberg)
1891	stud.	Paris
1891	P.assoc.	Brown (psych.)
1896	Dir.	Harvard Psych. Lab. (fill-in for Münsterberg)
1896	P.	Brown (psych.)
1932	ret.	

DELBOEUF, Joseph Remi Leopold (1831-1896)

1863	P.	Ghent
1866	"	Liège

DESSOIR, Max (1867-1947)

1889	D.ph.	Berlin (Dilthey)
1892	D.med.	Würzburg
1892	habil.	Berlin
1897	P.Ext.	"
1920	P.O.	"

DILTHEY, Wilhelm Christian Ludwig (1833-1911)

1852	stud.	Heidelberg, Berlin
1864	D.ph.	Berlin
1864	habil.	"
1866	P.O.	Basel
1868	"	Kiel
1871	"	Breslau
1884	"	Berlin
1905	ret.	

SDITTRICH, Ottmar Johannes Peter Leopold (1865-?)

1884	stud.	Vienna
1887	teach.	
1893	stud.	Leipzig
1898	D.ph.	Leipzig
1904	habil.	"
1912	P.Ext.	"
1912	Asst.	Leipzig (Wundt) 7 semesters Exp. Phonetik u. Sprachpsychologie
1933	ret.	

DODGE, Raymond (1871-1942)

1893	A.B.	Williams
1896	D.ph.	Halle (B. Erdmann)
1897	P.	Ursinus College (phil.)
1897	Instr.	Wesleyan (psych.)
1898	P.assoc.	"
1899	P.	"
1924	"	Yale (psych.)
1936	ret.	

DONDERS, Franciscus Cornelius (1818-1889)

1840	D.med.	Leiden
1842	P.Ext.	Utrecht
1852	P.O.	Utrecht: (anatomy and physiology)

SDÜRR, Ernst (1878-1913)

1897	stud.	Würzburg (Külpe, Marbe)
1899	"	Leipzig
1901	Asst.	Leipzig (Wundt) 3 semesters
1902	D.ph.	Leipzig (Wundt)
1903	habil.	Würzburg (Asst. to Külpe)
1906	P.Ext.	Bern
1907	P.O.	"

DWELSHAUVERS, George (1866-1937)

	D.ph.	Brussels
1889	stud.	Leipzig (Wundt)
1897	Dir.	Brussels, Institute of Exp. Psych.
1899	P.Ext.	Brussels
1904	P.	"
1919	Instr.	Barcelona (Dir. of Psych. Inst.)
1925	P.	Catholic U. Paris
	Dir.	Institute of exp. Psychology

SEBBINGHAUS, Hermann (1850-1909)

1867	stud.	Bonn, Halle, Berlin
1870		soldier in Franco-Prussian War
1873	D.ph.	Bonn
1880	habil.	Berlin (Zeller, Helmholtz)
1886	P.Ext.	"
1894	P.O.	Breslau
1905	"	Halle

EHRENFELS, Christian von (1859-1932)

	stud.	Vienna (Brentano)
1885	D.ph.	Graz (Meinong)
1888	habil.	Vienna
1896	P.Ext.	Prague
1899	P.O.	"

ELEUTHEROPULOS, Habrateles (1873-?)

	stud.	Leipzig
1896	habil.	Zürich
1915	P.Ext.	"
1926	P.	Salonica (sociology)

ELSENHANS, Theodor (1862-1918)

1885	D.ph.	Tübingen (Sigwart)
1891		pastor
1902	habil.	Heidelberg
1908	P.O.	T.H. Dresden

SERDMANN, BENNO (1851-1921)

1873	D.ph.	Berlin
1876	habil.	"
1878	P.Ext.	Kiel
1879	P.O.	"
1884	"	Breslau (psych. lab.)
1890	"	Hall (psych. lab.)
1898	"	Bonn (psych. lab.)
1909	"	Berlin

ETTLINGER, Max Emil (1877-1929)

1895	stud.	Heidelberg, Munich (T. Lipps)
	D.ph.	Munich (T. Lipps)
1914	habil.	Munich (Külpe)
1917	P.O.	Münster (succ. Becher)

FISCHER, Alois (1880-1937)

	stud.	Munich (T. Lipps)
1904	D.ph.	" "
1907	habil.	" "
1915	P.Ext.	"
1918	P.O.	" (pedagogy)

FREUDENTHAL, Jacob (1839-1907)

	stud.	Breslau, Göttingen
1863	D.ph.	Göttingen (Lotze)
1875	habil.	Breslau
1879	P.Ext.	"
1888	P.O.	"

FREY, Max Ruppert Franz von (1852-1932)

	stud.	Vienna (Brücke), Leipzig (Ludwig)
	stud.	Freiburg, Munich
1877	D.med.	Leipzig (Ludwig)
1880	Asst.	" "
1882	habil.	Leipzig
1891	P.Ext.	"
1898	P.O.	Zürich
1899	"	Würzburg (succ. to A. Fick)

FREYTAG, Willy (1873-?)

1900	habil.	Bonn (Erdmann)
1908	P.Ext.	"
1910	"	Zürich
1911	P.O.	"

GALTON, Francis (1822-1911)

1844	B.A.	Cambridge
		No academic positions

GROOS, Karl Theodor (1861-1946)

1880	stud.	Heidelberg
1884	D.ph.	"
1889	habil.	Giessen
1892	P.Ext.	"
1898	P.O.	Basel
1901	"	Giessen
1911	"	Tübingen
1929	ret.	

HALL, Granville Stanley (1844-1924)

1867	A.B.	Williams
1867	stud.	Union Theological Seminary
1869	"	Berlin, Bonn
1870	"	Union Theological Seminary
1871	"	Berlin, Heidelberg
1872	P.	Antioch (phil.)
1876	Instr.	Harvard "
1878	Ph.D.	Harvard
1878	stud.	Berlin, Leipzig (Wundt)
1880	Lec.	Harvard, Williams (phil.)
1881	P.	Johns Hopkins (psych.)
1888	Pres.	Clark (also P. of psych.)

HEINZE, Max (1835-1909)

1854	stud.	Leipzig, Halle, Erlangen
	stud.	Tübingen, Berlin
1860	D.ph.	Berlin (Trendelenburg)
	teach.	Fürstenschule Pforta (taught Nietzsche)
1863	teach.	Court Tutor, Grand Duke of Oldenburg
1872	habil.	Leipzig
	P.Ext.	"
	P.O.	Basel
	"	Königsberg
1875	"	Leipzig (same time as Wundt)

SHELLPACH, Willy Hugo (1877-1955)

1900	D.ph.	Leipzig (Wundt)
1903	D.med.	Leipzig
1906	habil.	T.H. Karlsruhe (psych.)
1911	P.Ext.	" "
1920	P.O.	" "
1926	P.H.	Heidelberg (applied psych.)

HELMHOLTZ, Hermann Ludwig Ferdinand von (1821-1894)

1838	stud.	Berlin (J. Müller)
1842	D.med.	" "
		military doctor
1849	P.Ext.	Königsberg (physiology)
1851	P.O.	" "
1855	"	Bonn (anatomy & physiology)
1858	"	Heidelberg (physiology)
1871	"	Berlin (physics)

HENRI, Victor (1872-1940)

	stud.	Paris (Binet)
1894	stud.	Leipzig (Wundt)
1897	D.ph.	Göttingen (G.E. Müller)
1903		degree in chemistry
1920	F.Ext.	Zürich (phys. chemistry)
1924	P.O.	" "
1932	"	Liège (chemistry)

HENSEN, Christian Andreas Victor (1835-1924)

	stud.	Würzburg, Berlin, Kiel
1859	D.med.	Kiel (Panum)
1860	habil.	" "
1864	P.Ext.	Kiel (physiology)
1868	P.O.	Kiel (succ. Panum)
1911	ret.	

HERBART, Johann Friedrich (1776-1841)

1794	stud.	Jena
1797	teach.	in Switzerland
1802	D.ph.	Göttingen
1802	habil.	"
1808	P.O.	Königsberg
1833	"	Göttingen

HERING, Karl Ewald Konstantin (1834-1918)

1858	D.med.	Leipzig
1862	habil.	Leipzig
1865	P.O.	Vienna (physiology)
1870	"	Prague "
1895	"	Leipzig (succ. Ludwig)

HEYMANS, Gerardus (1857-1930)

1890	D.ph.	Freiburg
1890	P.	Groningen
1926	ret.	

SHILLEBRAND, Franz (1863-1926)

1892	habil.	Vienna (Brentano)
1894	P.Ext.	Vienna
1896	P.O.	Innsbruck

HÖFFDING, Harald (1843-1931)

1865	D.theol.	Copenhagen
1870	D.ph.	"
1870	habil.	"
1883	P.O.	"
1915	ret.	

HÖFLER, Alois (1853-1922)

1871	stud.	Vienna
1876	teach.	
1885	D.ph.	Vienna (Brentano)
1886	stud.	Graz (Meinong)
1894	habil.	Vienna (pedagogy)
1904	P.O.	Prague (pedagogy)
1907	"	Vienna (pedagogy)

SHÖNIGSWALD, Richard (1875-1947)

1902	D.med.	Vienna
	stud.	Graz (Meinong)
1904	D.ph.	Halle (Riehl)
1906	habil.	Breslau (Ebbinghaus)
1916	P.Ext.	Breslau
1919	P.O.	"
1930	"	Munich
1933	ret.	

SHORNBOSTEL, Erich Mortiz von (1877-1935)

1900	D.ph.	Berlin (Stumpf)
1905	Asst.	Berlin (Stumpf) 2 semesters
1917	P.Ext.	Berlin (systematische Musikwissenschaft)
1933	ret.	
1933	P.	New School of Social Research, NYC
1935	P.	Cambridge (died before assuming duties)

HUSSERL, Edmund (1859-1938)

1876	stud.	Leipzig
1878	"	Berlin, Vienna
1882	D.ph.	Vienna (mathematics)
1883	Asst.	Berlin (Weierstrass)
1883	stud.	Vienna (Brentano)
1887	habil.	Halle (Stumpf)
1894	P.Ext.	Halle
1901	P.Ext.	Göttingen
1906	P.O.	Göttingen
1916	"	Freiburg (succ. Rickert)
1928	ret.	

SJAENSCH, Erich Rudolf (1883-1940)

	stud.	Tübingen, Jena, Breslau, Göttingen
1908	D.ph.	Göttingen (G.E. Müller)
1910	habil.	Strassburg
1912	habil.	Halle
1913	P.O.	Marburg (succ. Cohen)

JAMES, William (1842-1910)

1870	D.med.	Harvard
1872	P.asst.	Harvard (anatomy & physiology)
1880	"	Harvard (phil.)
1885	P.	Harvard (phil.)
1889	"	Harvard (psych.)
1897	"	Harvard (phil.)
1907	ret.	

JANET, Pierre (1859-1947)

1889	D.let.	Paris
1893	D.med.	"
1890		Salpêtrière (Charcot)
1895	Pr.	Paris (exp. psych.)
1902	"	Collège de France
1936	ret.	

JODL, Friedrich (1849-1914)

1867	stud.	Munich
1872	D.ph.	"
1873	teach.	Kriegsakademie, Munich
1880	habil.	Munich
1885	P.O.	Prague (succ. Stumpf)
1896	"	Vienna

JUDD, Charles, Hubbard (1873-1946)

1894	A.B.	Wesleyan
1896	D.ph.	Leipzig (Wundt)
1896	Instr.	Wesleyan (phil.)
1898	P.	New York University (exp. psych.)
1901	"	Cincinnati (psych. & pedagogy)
1902	Instr.	Yale (psych. with Scripture)
1904	P.asst.	Yale (psych.)
1907	P.	" "
1909	"	Chicago (education)
1938	ret.	

\$KAFKA, Gustav (1883-1953)

1902	stud.	Vienna
1904	"	Göttingen
1904	"	Leipzig (Wundt), Munich (T. Lipps)
1906	D.ph.	Leipzig (Wundt)
1910	habil.	Munich (T. Lipps)
1915	P.Ext.	Munich (Asst. to Külpe)
1918		Psychological services, Austro-Hungarian army
1919	P.Ext.	Munich
1923	P.O.	T.H. Dresden (succ. Bühler)
1934	ret.	
1947	P.O.	Würzburg

\$KATZ, David (1884-1953)

1902	stud.	Göttingen (G.E. Müller, Husserl)
1906	D.ph.	Göttingen (G.E. Müller)
	stud.	Munich (T. Lipps)
	stud.	Würzburg (Külpe)
1907	Asst.	Göttingen (G.E. Müller), until 1919
1911	habil.	Göttingen (G.E. Müller)
1919	P.O.	Rostock (psych. and pedagogy)
1933	ret.	
1933	stud.	Manchester (honorary research fellow)
1935	stud.	London (Cyril Burt)
1937	P.	Stockholm (psych. and pedagogy)

KIESOW, Friedrich (1858-1940)

1891	stud.	Leipzig
1892	Fam.	Leipzig (Wundt) 5 semesters
1894	D.ph.	Leipzig (Wundt)
1894	Asst.	Leipzig (Wundt) 3 semesters
1895	Asst.	Turin (Mosso)
1899	Lec.	Turin (libero docente, physiology)
1906	P.Ext.	Turin (exp. psych.)

\$KIRSCHMANN, August (1860-1932)

1880	teach.	
1887	stud.	Leipzig
1888	Fam.	Leipzig (Wundt) 6 semesters
1890	D.ph.	Leipzig (Wundt)
1891	Asst.	Leipzig (Wundt) 2 semesters
1893	Lec.	Toronto
1899	P.assoc.	"
1903	P.	"
1915	Asst.	Leipzig (Wundt)
1918	habil.	Leipzig (Krueger)
1922	P.H.	Leipzig

SKLEMM, Gustav *Otto* (1884-1939)

1903	stud.	Munich (T. Lipps)
1904	stud.	Leipzig
1906	D.ph.	Leipzig (Wundt)
1906	Asst.	Leipzig (Wundt) to 1917
1908	habil.	Leipzig (Wundt)
1923	P.Ext.	Leipzig
1938	Dir.	Leipzig Psychological Institute

SKOFFKA, Kurt (1886-1941)

1903	stud.	Berlin (Riehl)
1904	"	Edinburgh
1908	D.ph.	Berlin (Stumpf)
1908	Asst.	Freiburg (J. von Kries, physiology)
1909	Asst.	Würzburg (Külpe, psych.)
1910	Asst.	Frankfurt Academy (Schumann, psych.)
1911	habil.	Giessen
1918	P.Ext.	"
1924	P.	Cornell (visiting)
1925	"	Clark (visiting)
1926	"	Wisconsin (visiting)
1927	"	Smith College
1939	"	Oxford (visiting)

SKÖHLER, Wolfgang (1887-1967)

	stud.	Tübingen, Bonn, Berlin
1909	D.ph.	Berlin (Stumpf)
1910	Asst.	Frankfurt Academy (Schumann, psych.)
1911	habil.	Frankfurt Academy "
1914	Dir.	Prussian Anthropoid Station, Tenerife
1920	P.O.	Berlin (fill-in for Stumpf)
1921	P.O.	Göttingen
1922	"	Berlin (succ. Stumpf)
1934	P.	Harvard (visiting)
1935	"	Swarthmore College (psych. & phil.)
1948	ret.	

KÖNIG, Arthur (1856-1901)

1882	D.ph.	Berlin (physics, Helmholtz)
1884	habil.	Berlin (physics)
1889	P.O.	" "

KRAEPELIN, Emil (1856-1926)

	stud.	Würzburg, Munich
1878	D.med.	Würzburg
1878	stud.	Munich
1882	habil.	Leipzig (Flehsig, psychiatry) practice in Munich, Leubus, Dresden
1886	P.O.	Dorpat (psychiatry)
1891	"	Heidelberg "
1904	"	Munich "
1922	ret.	

KREYENBÜHL, Johannes (1846-1929)

1881	habil.	Zürich
1900	ret.	

KRIES, Johannes von (1853-1928)

	stud.	Halle, Leipzig, Zürich
1876	D.med.	Leipzig (Ludwig)
1876	stud.	Berlin (Helmholtz)
1877	Asst.	Leipzig (Ludwig)
1880	P.Ext.	Freiburg (physiology)
1883	P.O.	" "
1924	ret.	

SKRUEGER, Felix (1874-1948)

	stud.	Strassburg (Windelband), Berlin (Dilthey)
1897	D.ph.	Munich (T. Lipps)
1897	stud.	Wundt
1899	Asst.	Kiel (Hensen, physiology)
1902	Asst.	Leipzig (Wundt) 7 semesters
1903	habil.	Leipzig (Wundt)
1906	P.	Buenos Aires
1908	habil.	Leipzig (Wundt)
1910	P.O.	Halle (succ. Meumann)
1917	"	Leipzig (succ. Wundt)
1938	ret.	

KÜHNEMANN, Eugen (1868-1946)

1886	stud.	Marburg (Cohen)
1887	stud.	Munich, Berlin, Munich
1889	D.ph.	Munich (Prandl)
	stud.	Göttingen, Berlin, Paris
1895	habil.	Marburg (Cohen)
1903	teach.	Bonn, Frankfurt, Posen
1906	P.O.	Breslau
1935	ret.	

SKÜLPE, Oswald (1862-1915)

1881	stud.	Leipzig
1882	"	Berlin
1883	"	Göttingen (G.E. Müller)
1886	"	Dorpat (history)
1886	"	Leipzig
1887	D.ph.	Leipzig (Wundt)
1887	Asst.	Leipzig (Wundt) 14 semesters
1888	habil.	" "
1894	P.Ext.	Leipzig
1894	P.O.	Würzburg (succ. J. Volkelt)
1909	"	Bonn (succ. B. Erdmann)
1913	"	Munich (succ. T. Lipps)

KYM, Andreas Ludwig (1822-1900)

1849	habil.	Zürich
1851	P.Ex.	"
1856	P.O.	"

LADD, George Trumball (1842-1921)

1864	A.B.	Western Reserve
1869	B.D.	Andover Theological Seminary
1869		pastor
1879	P.	Bowdoin College (phil.)
1881	"	Yale (phil.)
1906	Lec.	Japan, several places
1908	Lec.	Western Reserve
1909	ret.	

LANGE, Carl Georg (1834-1900)

1853	stud.	Copenhagen
1859	D.med.	"
1867	stud.	Zürich, Florence
1875	Lec.	Copenhagen (pathological anatomy)
1885	P.O.	"

LANGE, Friedrich Albert (1828-1875)

1851	D.ph.	Bonn
1852	teach.	
1855	habil.	Bonn
1858	teach.	also politics
1869	habil.	Zürich
1870	P.O.	"
1872	"	Marburg

LANGE, Ludwig (1863-1936)

1882	stud.	Leipzig, Giessen
1886	D.ph.	Leipzig (Wundt)
1886	Asst.	Leipzig (Wundt) 2 semesters
1887		chronic illness

LAZARUS, Moritz (1824-1903)

1849	D.ph.	Berlin
1860	P.H.	Bern
1862	P.O.	"
1867	teach.	Kriegsakademie, Berlin
1873	P.H.	Berlin (psych.)
1897	ret.	

LEHMANN, Alfred Georg Ludwig (1858-1921)

1884	D.ph.	Copenhagen
1884	stud.	Leipzig (Wundt)
1886	habil.	Copenhagen

SLIPPS, Gottlob *Friedrich* (1865-1931)

1888	D.ph. teach.	Leipzig (Wundt)
1904	habil.	Leipzig (Wundt)
1909	P.Ext.	Leipzig
1911	P.O.	Zürich

SLIPPS, Theodor (1851-1914)

1874	D.ph.	Bonn (Meyer)
1877	habil.	" "
1884	P.Ext.	Bonn
1890	P.O.	Breslau
1894	P.O.	Munich
1912	ret.	

LOTZE, Rudolph *Hermann* (1817-1881)

1834	stud.	Leipzig
1838	D.med.	"
1838	D.ph.	"
1839	habil.	Leipzig (med.)
1840	habil.	Leipzig (phil.)
1842	P.Ext.	Leipzig "
1844	P.O.	Göttingen (succ. Herbart)
1881	"	Berlin

LUDWIG, Carl Friedrich Wilhelm (1816-1895)

1840	D.med.	Marburg
1842	habil.	"
1846	P.Ext.	"
1849	P.O.	Zürich (anatomy and physiology)
1856	"	Vienna "
1865	"	Leipzig (physiology)

MACH, Ernst (1838-1916)

1860	D.ph.	Vienna (physics)
1861	habil.	" "
1864	P.O.	Graz (physics)
1867	"	Prague "
1895	"	Vienna (phil.)
1901	ret.	

SMARBE, Karl (1869-1953)

	stud.	Freiburg (Münsterberg, Riehl)
1890	stud.	Bonn (Martius), Berlin (Ebbinghaus)
1893	D.ph.	Bonn (Meyer)
1894	stud.	Leipzig (Wundt)
1896	habil.	Würzburg (Külpe)
1902	P.Ext.	"
1905	P.O.	Frankfurt Academy
1909	"	Würzburg (succ. Külpe)
1934	ret.	

SMARTIUS, Götz (1853-1927)

1871	stud.	Bonn
1877	D.ph.	Bonn (Meyer)
	teach.	
1885	habil.	Bonn (Meyer)
1887	stud.	Leipzig (Wundt)
1895	P.Ext.	Bonn
1898	P.O.	Kiel (succ. Riehl)

MARTY, Anton (1847-1914)

	stud.	Würzburg (Brentano)
	teach.	
1875	D.ph.	Göttingen (Lotze)
	P.O.	Czernowitz
1880	"	Prague
1913	ret.	

MASIUS, Hermann (1818-1893)

	teach.	Leipzig
1862	P.O.	Leipzig (pedagogy)

SMEINONG, Alexius von (1853-1920)

1874	D.ph.	Vienna (history)
1878	habil.	Vienna (Brentano)
1882	P.Ext.	Graz
1889	P.O.	Graz

SMENTZ, Paul Ernst (?-?)

1895	D.ph.	Leipzig (Wundt)
1896	Asst.	Leipzig (Wundt) 7 semesters
1899	habil.	" "
1914	ret.	

MENZER, Paul (1873-?)

1897	D.ph.	Berlin (Düthey)
1900	habil.	Berlin
1906	P.Ext.	Marburg
1908	P.O.	Halle (succ. Busse)

MERCIER, Désiré Felicien François Joseph (1851-1926)

1882	D.ph.	Louvain (phil. and theology)
1882	Pr.	Louvain (phil.)
1906		Archbishop
1907		Cardinal

SMESSER, August Wilhelm (1867-1937)

1885	stud.	Giessen, Strassburg, Heidelberg
1892	D.ph.	Giessen (Siebeck)
1899	habil.	Giessen
1904	P.Ext.	"
1910	P.O.	Giessen (succ. Groos)

SMEUMANN, Ernst Friedrich Wilhelm (1862-1915)

1887	D.ph.	Tübingen (Sigwart)
1892	Asst.	Leipzig (Wundt) 10 semesters
1894	habil.	Leipzig (Wundt)
1897	P.Ext.	Zürich (succ. Avenarius)
1900	P.O.	Zürich
1905	"	Königsberg (succ. Busse)
1907	"	Münster (succ. Busse)
1909	"	Halle (succ. Ebbinghaus)
1910	"	Leipzig (succ. Heinze via J. Volkelt)
1911	"	Hamburg Kolonialinstitut

MEYER, Jürgen Bonna (1829-1897)

1862	habil.	Berlin
1868	P.O.	Bonn

MICHOTTE, Albert Eduard (1881-1965)

1900	D.ph.	Louvain (Mercier)
	stud.	Leipzig (Wundt), Würzburg (Külpe)
1905	habil.	Louvain Institute of Philosophy (psych.)
1912	P.O.	Louvain (exp. psych.)
1914	"	Utrecht "
1918	"	Louvain "
1956	ret.	

MÖBIUS, Hugo Wolfgang (1876-?)

1895	stud.	Leipzig
1898	Asst.	Leipzig (Wundt) 3 semesters
1898	D.ph.	Leipzig

SMOEDE, Walther (1888-1958)

1911	D.ph.	Leipzig
1913	Asst.	Leipzig (Brahn) 2 semesters
1919	habil.	T.H. Berlin (Industrielle Psychotechnik)
1921	P.Ext.	" "
1935	"	Berlin (Psychotechnik)

MOSCH, Erich (1876-?)

1894	stud.	Leipzig
1897	Asst.	Leipzig (Wundt) 2 semesters
1899	D.ph.	Leipzig (Wundt)

MOSSO, Angelo (1846-1910)

1865	stud.	Turin
1870	D.med.	Turin
	stud.	Florence
1873	stud.	Leipzig (Ludwig)
1875	P.	Turin (pharmacology)
1879	"	Turin (physiology, succ. to Moleschott)

MÜLLER, Georg Elias (1850-1934)

1873	D.ph.	Göttingen (Lotze)
1876	habil.	" "
1880	P.O.	Czernowitz
1881	"	Göttingen (succ. Lotze)
1922	ret.	

MÜLLER, Johannes Peter (1801-1858)

1822	D.med.	Bonn
1824	habil.	"
1826	P.O.	Bonn (anatomy and physiology)
1833	"	Berlin "

MULLER, Robert (1875-?)

1894	stud.	Giessen, Munich
1898	D.ph.	Leipzig (Wundt)
1899	Asst.	Leipzig (Wundt) 3 semesters

MÜNSTERBERG, Hugo (1863-1916)

1882	stud.	Geneva, Leipzig
1885	D.ph.	Leipzig (Wundt)
1887	D.med.	Heidelberg
1887	habil.	Freiburg (Riehl)
1891	P.Ext.	Freiburg (phil.)
1892	P.	Harvard (psych.)
1895	P.Ext.	Freiburg (phil.)
1897	P.	Harvard (psych.)

NATORP, Paul (1854-1924)

1871	stud.	Berlin, Bonn, Strassburg
1881	habil.	Marburg (Cohen)
1885	P.Ext.	Marburg
1892	P.O.	"

PAULI, Richard (1886-1951)

1911	D.ph.	Munich (T. Lipps)
1914	habil.	Munich (Külpe)
1920	P.Ext.	Munich

PAVLOV, Ivan Petrovich (1849-1936)

1883	D.med.	St. Petersburg Medical Academy
1884	stud.	Breslau (Heidenhain), Leipzig (Ludwig)
1890	P.	St. Petersburg Med. Ac. (pharmacology)
1895	"	St. Petersburg Med. Ac. (physiology)
1904		Nobel Prize in physiology and medicine

PEARSON, Karl (1857-1936)

1879	A.B.	Cambridge
	stud.	Heidelberg, Berlin
1881	M.A.	Cambridge
1884	P.	University College London (mathematics)
1911	"	" (Galton Chair of Eugenics)
1933	ret.	

PEIRCE, Charles Santiago Sanders (1839-1914)

1860	A.B.	Harvard
1863	Sc.B.	Harvard (chemistry)
1879	Lec.	Harvard, Johns Hopkins and elsewhere

PFLÜGER, Eduard Friedrich Wilhelm (1829-1910)

	stud.	Heidelberg
1850	stud.	Marburg
1851	D.med.	Giessen
1855	D.med.	Berlin (J. Müller)
	habil.	Berlin
1859	P.O.	Bonn (physiology, succ. Helmholtz)

PREYER, William Thierry (1841-1897)

1862	D.ph.	Heidelberg (physiology, chemistry)
1866	D.med.	Bonn (Pflüger)
1867	habil.	Jena (physiology)
1869	P.O.	Jena (succ. Czermak)
1888	ret.	

PURKINJE, Jan Evangelista (1787-1869)

1818	D.med.	Prague
1823	P.O.	Breslau (physiology & pathology)
1850	"	Prague (physiology)

RIBOT, Théodule Armand (1839-1916)

1865	D.ph.	École Normale Supérieure, Paris
1885	P.	Sorbonne, Paris (ex. psych.)
1888	"	Collège de France, Paris "
1896	ret.	

RICHTER, Raoul (1871-1912)

1893	D.ph.	Leipzig (Wundt)
1898	habil.	Leipzig
1905	P.Ext.	"

RICKERT, Heinrich (1863-1936)

1888	D.ph.	Strassburg (Windelband)
1891	habil.	Freiburg (Riehl)
1894	P.Ext.	"
1896	P.O.	Freiburg (succ. Riehl)
1916	"	Heidelberg (succ. Windelband)

SRIEHL, Alois (1844-1924)

	stud.	Vienna, Innsbruck, Munich, Graz
1870	habil.	Graz
1873	P.Ext.	"
1878	P.O.	"
1882	"	Freiburg
1896	"	Kiel
1898	"	Halle (psych. lab.)
1905	"	Berlin

SRUPP, Hans (1880-?)

	stud.	Vienna, Innsbruck, Göttingen
1904	D.ph.	Innsbruck
	Asst.	Göttingen (G.E. Müller)
1907	Asst.	Berlin (Stumpf), many years
1909	habil.	Berlin (Stumpf)
1919	P.Ext.	Berlin

SSALOW, Paul (?-1913)

1907	D.ph.	Leipzig (Wundt)
1908	Asst.	Leipzig (Wundt) 9 semesters
1911	habil.	Leipzig (Wundt)

SSANDER, Friedrich (1889-?)

1913	D.ph.	Leipzig (Wundt)
1913	Asst.	Leipzig (Wundt) 9 semesters
1923	habil.	Leipzig (Krueger)
1925	P.Ext.	Leipzig
1929	"	Giessen (Dir. Psych. Inst.)
1933	"	Jena (Dir. Psych. Inst.)
1951	"	Berlin, Freie Universität, T.U.
1954	"	Bonn (Dir. Psych. Inst.)
1958	ret.	

SSCHUMANN, Friedrich (1863-1940)

1885	D.ph.	Göttingen (physics)
1887	Asst.	Göttingen (G.E. Müller)
1892	habil.	Göttingen "
1894	habil.	Berlin (Asst. to Stumpf)
1905	P.O.	Zürich (succ. Meumann)
1910	"	Frankfurt Academy (succ. Marbe)
1914	"	Frankfurt University
1928	ret.	

SCHWARZ, Hermann (1864-?)

1888	D.ph.	Halle (Stumpf)
1894	habil.	" (Erdmann)
1908	P.Ext.	Marburg
1910	P.O.	Greifswald
1933	ret.	

SSCRIPTURE, Edward Wheeler (1864-1945)

1884	A.B.	City College of New York
1890	A.M.	"
1891	D.ph.	Leipzig (Wundt)
1892	Instr.	Yale (exp. psych.)
1898	Dir.	Yale Psychological Laboratory
1901	P.asst.	Yale (exp. psych.)
1903	stud.	Munich (Kraepelin)
1906	D.med.	Munich (psychiatry)
1909	P.assoc.	Columbia (psychiatry)
1923	P.O.	Vienna (exp. phonetics)
1933	ret.	

SECHENOV, Ivan Mikhailovich (1829-1905)

1851	D.med.	St. Petersburg Military Academy
1856	stud.	Berlin (Müller, du Bois-Reymond)
	stud.	Heidelberg (Helmholtz), Vienna (Ludwig)
1860	P.	St. Petersburg Military Academy
1870	"	Odessa (physiology)
1876	"	St. Petersburg "
1891	"	Moscow "
1901	ret.	

SIGWART, Christoph (1830-1904)

1846	stud.	Tübingen (phil.)
1852	teach.	
1858	stud.	Tübingen (theology)
1859	teach.	
1865	P.O.	Tübingen (phil.)
1903	ret.	

SPEARMAN, Charles Edward (1863-1945)

	stud.	Würzburg (Külpe), Göttingen (Müller)
1905	D.ph.	Leipzig (Wundt)
1907	Read.	University College London (exp. psych.)
1911	P.	University College London (mind & logic)
1928	"	University College London (psych.)
1931	ret.	

SPRANGER, Eduard (1882-1963)

	stud.	Berlin (Dilthey)
1905	D.ph.	Leipzig
1909	habil.	Berlin
1911	P.Ext.	Leipzig
1912	P.O.	Leipzig (succ. Meumann)
1920	"	Berlin (succ. Erdmann)
1936	P.	Japan (visiting)
1938	P.O.	Berlin
1946	"	Tübingen

STEINTHAL, Hajim (1823-1899)

1843	stud.	Berlin
1847	D.ph.	Tübingen
1850	habil.	Berlin
1852	stud.	Paris, London
1856	habil.	Berlin
1862	P.Ext.	Berlin (Sprachwissenschaften)

STERN, Louis William (1871-1938)

1888	stud.	Berlin
1893	D.ph.	Berlin (Ebbinghaus)
1897	habil.	Breslau (Ebbinghaus)
1907	P.Ex.	Breslau (Dir. of psych. lab)
1916	P.O.	Hamburg Kolonialinstitut (succ. Meumann)
1919	"	Hamburg University
1933	P.	Duke University

STÖRRING, Gustav Wilhelm (1860-1946)

1890	D.med.	Halle
1896	habil.	Leipzig (Wundt)
1902	P.O.	Zürich (succ. Kym)
1911	"	Strassburg (succ. Ziegler)
1914	"	Bonn (succ. Külpe)
1927	"	ret.

SSTUMPF, Carl (1848-1936)

1865	stud.	Würzburg (Brentano)
1868	D.ph.	Göttingen (Lotze)
1870	habil.	" "
1873	P.O.	Würzburg (succ. Brentano)
1879	"	Prague
1884	"	Halle (psych. lab.)
1889	"	Munich (psych. lab.)
1894	"	Berlin (succ. Zeller) Dir. Psych. Sem.
1900	Dir.	Berlin Psychological Institute
1921	ret.	

THIÉRY, Armand (1868-?)

1892	stud.	Leipzig (Wundt)
1895	D.ph.	" "
1895	habil.	Louvain (physics & physiology)

TITCHENER, Edward Bradford (1867-1927)

1890	A.B.	Oxford
1892	D.ph.	Leipzig (Wundt)
1892	P.asst.	Cornell (psych.)
1894	A.M.	Oxford
1895	P.	Cornell (psych.)

ULRICI, Hermann (1806-1884)

1824	stud.	Halle, Berlin
1833	habil.	Berlin
1834	P.Ext.	Halle
1861	P.O.	Halle

VAIHINGER, Hans (1852-1933)

1874	D.ph.	Tübingen
	stud.	Leipzig
1877	habil.	Strassburg
1883	P.Ext.	"
1884	P.Ext.	Halle
1894	P.O.	"
1906	ret.	

VIERKANDT, Alfred (1867-1953)

1892	D.ph.	Leipzig
1900	habil.	Berlin
1921	P.Ext.	"
1925	P.O.	Berlin (sociology)

VIERORDT, Karl von (1818-1884)

1841	D.med.	Heidelberg
1849	P.Ext.	Tübingen (physiology)
1855	P.O.	" "

VOLKELT, Johannes (1848-1930)

	stud.	Vienna, Jena, Leipzig
1876	habil.	Jena
1879	P.Ext.	"
1883	P.O.	Basel
1889	"	Würzburg
1894	"	Leipzig

VOLKELT, Hans (1886-?)

1912	D.ph.	Leipzig (Wundt)
1921	habil.	Leipzig
1926	P.Ext.	Leipzig (phil. & pedagogy)
1934	P.O.	Leipzig (developmental psych. & political pedagogy)

VOLKMANN, Alfred Wilhelm (1800-1877)

1826	D.med.	Leipzig
	stud.	London, Paris
1834	P.O.	Dorpat (zoology)
1837	"	Dorpat (physiology & pathology)
1843	"	Halle (physiology)
1854	"	Halle (anatomy)
1873	ret.	

VOLKMANN, Wilhelm Fridolin (1821-1877)

	stud.	Prague
1845	D.ph.	"
1846	habil.	"
1856	P.Ext.	"
1861	P.O.	"

WATT, Henry Jackson (1879-1925)

1904	D.ph.	Würzburg (Külpe)
1907	Lec.	Liverpool (physiology)
1908	"	Glasgow (psych.)

WEBER, Ernst Heinrich (1795-1878)

1811	stud.	Wittenberg, Leipzig
1815	D.med.	Wittenberg
1817	habil.	Leipzig
1818	P.Ext.	"
1821	P.O.	Leipzig (human anatomy)
1840	"	Leipzig (anatomy and physiology)
1865	"	Leipzig (anatomy, Ludwig takes physiology)
1871	ret.	

SWERTHEIMER, Max (1880-1943)

	stud.	Prague (Ehrenfels)
1904	D.ph.	Würzburg (Külpe)
1912	habil.	Frankfurt (Schumann)
1918	habil.	Berlin (Stumpf)
1922	P.Ext.	Berlin
1929	P.O.	Frankfurt (succ. Schumann)
1933	P.	New School of Social Research, NYC

WILLY, Rudolf (1855-1918)

1885	habil.	Bern
1897	habil.	Zürich
1902	ret.	

WINDELBAND, Wilhelm (1848-1915)

	stud.	Jena, Berlin, Göttingen
1870	D.ph.	Göttingen (Lotze)
1873	habil.	Leipzig
1876	P.O.	Zürich (succ. Wundt)
1877	"	Freiburg
1882	"	Strassburg
1902	"	Heidelberg

SWIRTH, Wilhelm (1876-1952)

1897	D.ph.	Munich (T. Lipps)
1900	Asst.	Leipzig (Wundt) 17 semesters
1900	habil.	Leipzig (Wundt)
1906	P.Ext.	Leipzig
1908	Dir.	Leipzig Inst. (Mitdirektor for Wundt)
1917	Dir.	Leipzig Psychophysical Seminar

SWITASEK, Stephen (1870-1915)

1898	D.ph.	Graz (Meinong)
1900	habil.	" "
1906	P.Ext.	Graz

SWRESCHNER, Arthur (1866-1932)

	stud.	Berlin (Ebbinghaus)
1900	habil.	Zürich (Meumann)
1910	P.Ext.	Zürich (psych.)

WUNDT, Max (1879-?)

	stud.	Leipzig, Freiburg, Berlin, Munich
1903	D.ph.	Leipzig
1907	habil.	Strassburg
1918	P.Ext.	Marburg
1920	O.P.	Jena (succ. Eucken)
1929	"	Tübingen
1945	ret.	

SWUNDT, Wilhelm Maximilian (1832-1920)

1851	stud.	Tübingen (med.)
1852	"	Heidelberg (med.)
1856	D.med.	Heidelberg
1856	stud.	Berlin (J. Müller, du Bois-Reymond)
1857	habil.	Heidelberg (physiology)
1858	Asst.	Heidelberg (Helmholtz)
1864	P.Ext.	Heidelberg (physiology)
1874	P.O.	Zürich (phil.)
1875	"	Leipzig (phil.)
1876	D.ph.	Leipzig, <i>honoris causa</i>
1887	D.jur.	Göttingen, <i>honoris causa</i>
1888		Königlich-Sächsischer Geheimer Hofrat
1889	Rect.	Leipzig, 2 semesters
1901		Königlich-Sächsischer Geheimer Rat
1909		Königlich-Sächsischer Wirklicher Geheimer Rat, "Excellenz"
1917	ret.	

ZELLER, Eduard (1814-1908)

1840	habil.	Tübingen
1847	P.O.	Tübingen (theology)
1849	"	Marburg (theology)
1862	"	Heidelberg (phil.)
1872	"	Berlin (phil.)
1894	ret.	

ZIEGLER, Karl Reinhart Ludwig *Theobald* (1846-1918)

	D.ph.	Tübingen
1882	teach.	Strassburg
1884	habil.	Strassburg (phil. & pedagogy)
1886	P.O.	" "
1911	ret.	

SZIEHEN, Theodor (1862-1950)

1885	D.med.	Berlin
1886	habil.	Jena (psychiatry)
1893	P.Ext.	" "
1900	P.O.	Utrecht (psychiatry)
1903	"	Halle (psychiatry)
1904	"	Berlin (psychiatry)
1917	"	Halle (psych. in Phil. Fac.: succ. Krueger)
1930	ret.	

ZÖLLNER, Johann Karl *Friedrich* (1834-1882)

1855	stud.	Berlin
1857	stud.	Basel
1859	D.ph.	Basel (physics)
1865	habil.	Leipzig
1866	P.Ext.	"
1872	P.O.	Leipzig (astrophysics)

