

FIVE
First Among Equals:
Wundt

As Good a Birth Date as Any

According to most authorities, psychology was born on a December day in 1879. All that had gone before, from Thales to Fechner, had been the evolution of its ancestors.

The birth, a quiet affair, went unheralded. At the University of Leipzig that day, in a small room on the third floor of a shabby building called Konvikt (“hostel” or “retreat”), a middle-aged professor and two younger men

were setting up apparatus for an experiment. On a table they positioned a chronoscope (a brass clocklike mechanism with a hanging weight and two dials), a “sounder” (a metal stand with an elevated arm from which a ball would fall onto a platform), and a telegrapher’s key, battery, and rheostat. They then wired together the five pieces of apparatus, the circuitry being no more complicated than that of a present-day beginning electric train set.¹

The three were Professor Wilhelm Wundt, a long-faced, austere, densely bearded man of forty-seven, and two young students of his, Max Friedrich, a German, and G. Stanley Hall, an American. The set-up was for Friedrich’s benefit; with it he was going to collect data for a Ph.D. dissertation on “the duration of apperception”—the time lag between the subject’s recognition that he has heard the ball hit the platform and his pressing of the telegraph key.² It is not on record who made the ball drop that day and who sat at the key, but with the first *clack* of the ball on the platform, the click of the key, and the registration of

elapsed time on the chronoscope, the modern era of psychology had begun.

One could argue, of course, that it began in the 1830s, with Weber's work on just noticeable differences, or in 1850, with Helmholtz's measurement of the speed of nerve transmission and Fechner's first psychophysical experiment, or in 1868, with Donders's reaction-time studies. Or even, as Robert Watson has suggested, in 1875, since in that year the University of Leipzig granted Wundt the use of the room in Konvikt to store and demonstrate his apparatus, and Harvard University made a small room in Lawrence Hall available to William James for his experiments.³

But 1879 is the year recognized by most authorities, and for good reason. That was when the first experiment was conducted in the room in Konvikt that Wundt thenceforth called his "private institute."⁴ (In German universities, a formally organized laboratory is called an institute.)

Within a few years the laboratory had become a mecca for would-be psychologists and was considerably enlarged and designated the university's official Psychologisches Institut.

Largely because of the institute, Wundt is considered not just one of the founders but the principal founder of modern psychology. It was there that he conducted his own psychological research and trained many graduate students in his laboratory methods and theories, and from there that he sent forth cadres of new psychologists—he personally supervised nearly two hundred dissertations—to the universities of Europe and America. In addition, he wrote a number of scholarly articles and massive tomes that established psychology as a field of science with an identity of its own. He himself was the first scientist who can be properly called a psychologist rather than a physiologist, physicist, or philosopher with an interest in psychology.

Perhaps most important, Wundt restored the study of conscious mental processes to psychology. They had been its core from the time of the Greek philosophers, and still

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were for the English associationists, who, like all their predecessors, explored them through the traditional method of introspection. But the German mechanists, seeking to make psychology scientific, had rejected introspection on the grounds that it was subjective and dealt with unobservable phenomena. A scientific approach to psychological phenomena, they held, dealt only with the physical aspects of neural responses and, in the words of one of them, was a “psychology without a soul.”⁵

It is true that long before the first experiment in Wundt’s laboratory both Fechner and Donders had used experimental means to measure certain mental responses. But it was Wundt who fully developed the methods that would be used by the next two generations of psychologists, and it was he who became the leading proponent of the view that mental processes could be experimentally studied. He had, in fact, begun espousing this view as early as 1862, in the introduction to his *Contributions to the Theory of Sense Perception*:

The importance that experimentation will eventually have in psychology can hardly be visualized to its full extent as yet. It has often been held that the area of sensation and perception is the only one in which the use of the experimental method is possible... [but] surely this is a prejudice. As soon as the psyche is viewed as a natural phenomenon, and psychology as a natural science, the experimental methods must also be capable of full application to this science.

He drew an analogy between psychology and chemistry. Just as the chemist learns from experiments not only how a substance is affected by others but also what its own chemical nature is,

in precisely the same way in psychology...it would be quite wrong to say that the experiment determines only the action of [stimuli] on the psyche. The behavior of the psyche in response to the external influences is determined as well, and by varying those external influences we arrive at the laws to which the psychic life as such is

subject. The sensory stimuli are, for us, only *experimental tools*, to put it succinctly. By creating manifold changes in the sensory stimuli while continually studying the psychic phenomena, we apply the principle that is the essence of the experimental method; as [Francis] Bacon put it, “We change the circumstances in which the phenomena occur.”⁶

As many as a dozen years before the first experiment in his laboratory, Wundt was known as a bridge builder who sought to link physiology and mental processes. Word of his views had even reached America, where in 1867 the young William James wrote to a friend:

It seems to me that perhaps the time has come for psychology to begin to be a science—some measurements have already been made in the region lying between the physical changes in the nerves and the appearance of consciousness (in the shape of sense perceptions)... Helmholtz and a man named Wundt at Heidelberg are working on it, and I hope...to go to them in the summer.⁷

(James did not manage to meet Wundt that summer but did so many years later, by which time he himself was a leading figure in psychology.)

Some contemporary historians, critical of the Great Man approach to history, would say that the new science of psychology was created not by Wundt but by the general social and intellectual milieu of the mid-nineteenth century and by the state of development of the behavioral and social sciences. The animal psychology included in Darwin’s *On the Origin of Species* (and later in his *Expression of the Emotions in Man and Animals*), the sociological studies of Auguste Comte, the growing number of reports by anthropologists on the life, language, and ideas of preliterate peoples, and other related factors had created an atmosphere in which it was possible to think that human nature could be scientifically studied.

It is true that no Wundt could have arisen to launch experimental psychology in Tertullian’s time or Aquinas’s or even Descartes’s; there were no batteries, telegraph keys, and chronoscopes, much less a view of human behavior as a set of phenomena that could be investigated by

experiment. Yet in any field of knowledge, even at the right time and place there spring up not a thousand great men, and not a hundred, but a very few. Or even one: one Galileo, one Newton, one Darwin, inspiring thousands of lesser men (and, later, women) who learn from them and are able to push farther on. And one Wundt, who had the genius and drive to become the guiding light of the new psychology in Europe and the United States.

Yet today he seems a strange and paradoxical figure. Despite the immense reputation and influence he long had, his name is now all but unknown except to psychologists and scholars; most laypersons who can easily identify Freud, Pavlov, and Piaget have no idea who Wundt was. Even people who do know his place in history cannot agree on what his main ideas were; summaries of his system by various scholars seem to summarize different Wundts. And while for some time most psychologists have felt that Wundt's psychology was narrow in scope, a few historians of the field have recently re-evaluated his work and pronounced him a psychologist of great vision and breadth.⁸ (It may be indicative that his *Outlines of*

Psychology was still being republished as late as 1998.) To some degree, what makes him an enigma is that he was the epitome of the nineteenth-century German scholar: encyclopedic, dogged, authoritarian, and, in his own eyes, all but infallible—an ideal and a personality hard to comprehend today.

The Making of the First Psychologist

As puzzling as anything about Wundt is how the child could have become the man. In his boyhood and youth he seemed utterly lacking in the drive or intellectual capacity to become even modestly successful, let alone an outstanding figure in science and the world of higher education. He appeared, in fact, to be a dolt.

Born in 1832 in Neckarau, near Mannheim, in southwestern Germany, Wundt came from a family of intellectual achievers. His father was a village Lutheran pastor, but among his forebears were university presidents,

physicians, and scholars.⁹ For many years Wundt showed no trace of intellectual gifts and had no interest in learning; when he was a child, his only close friend was a retarded boy, and in school he was a habitual daydreamer. One day when Wundt was in first grade, his father visited the school as an observer and was so infuriated by his son's wool-gathering that he slapped his face in front of his classmates. Wundt never forgot the incident, but it did nothing to change him; even at thirteen, attending a Catholic gymnasium at Bruchsal, he was still such a dreamer that his homeroom teacher would publicly slap him, and another teacher would mock him in front of the other students—mostly ignorant farm boys who were themselves no models of scholarship. The teachers' punishments did no good; he failed the year and disgraced himself.

Wundt's parents then sent him to the Lyceum in Heidelberg. There, among students whom he found more congenial, he gained control over his daydreaming and progressed through the school years, though he never became more than an average student. When he graduated,

he had no idea what he wanted to do, but since his father had died and his mother had only a meager pension, he had to prepare for a profession in which he could earn a decent living. He chose medicine and enrolled at the University of Tübingen; out of his mother's sight, he played and idled a year away, learning almost nothing.

But when he came home at the end of the year and realized that there was barely enough money to get him through the next three years, he underwent an astonishing change. He started medical training over again in the fall at the University of Heidelberg, threw himself into his studies with such dedication and zeal that he completed his training in three years, and ranked first in the medical state board examinations in 1855.

Along the way, however, he had discovered that clinical practice did not appeal to him but that he was fascinated by the science courses in the curriculum. After receiving his M.D. *summa cum laude* in 1855, he spent a semester at the University of Berlin under Johannes Müller and Emil Du Bois-Reymond, and in 1857 was appointed lecturer in physiology at Heidelberg. The following year, when the

illustrious Hermann Helmholtz went there to establish a physiology institute, Wundt applied for the job of his laboratory assistant and got it. His work for Helmholtz further focused his interest on physiological psychology.

Still in his mid-twenties and still single, Wundt had become a thorough workaholic. In addition to his laboratory duties, he lectured, wrote textbooks to augment his income, carried on his own research on sense perception, and began drafting a major book on that subject, the *Contributions*, published in 1862. In it, Wundt, at only thirty, threw down the gauntlet to senior philosophers and mechanist physiologists by asserting that psychology could be a science only if it was based on experimental findings, and that the mind could indeed be experimentally investigated.

In 1864, Wundt was promoted to associate professor and resigned as Helmholtz's assistant to concentrate on his own interests. No longer having access to Helmholtz's laboratory, he created one at home, where he collected and fabricated the necessary apparatus and conducted his own psychological experiments. He continued to teach

experimental physiology, but his courses came to contain more and more psychological material. Not until his late thirties did he stray from his work long enough to court a young woman and become engaged to her, although for financial reasons they had to postpone their marriage.

Helmholtz left Heidelberg in 1871. Wundt seemed the logical successor to his chair, but while the university assigned him to many of Helmholtz's duties, it appointed him only Professor Extraordinarius at a quarter of Helmholtz's pay. The promotion enabled Wundt and his fiancée to marry, but he now worked longer and harder than ever on his book, *Principles of Physiological Psychology*, hoping that it would enable him to escape from Heidelberg.

It did. In Part One—it appeared in two parts, in 1873 and 1874—Wundt immodestly wrote, “The work I here present to the public is an attempt to mark out a new domain of science.” It brought him the acclaim he sought, the offer of a chair of philosophy at the University of Zürich, and a year later the offer of a much better chair at the University of Leipzig.

Wundt went to Leipzig in 1875, wangled the use of the room in Konvikt for storage and demonstrations, and four years later began using it as his private institute. His lectures became so popular, and his reputation and that of his laboratory drew so many acolytes to Leipzig that in 1883 the university increased his salary, granted his institute official status, and gave him additional space to turn the laboratory into a seven-room suite.¹⁰

He himself spent relatively little of his time in the laboratory and most of it in lecturing, running the institute, and writing and revising weighty books on psychological subjects and, later, on logic, ethics, and philosophy. His day was as rigidly structured as Immanuel Kant's. He wrote during much of the morning and then had a consultation hour, visited the laboratory in the afternoon, went for a walk during which he thought over his next lecture, delivered it, and then briefly dropped in again at the laboratory. His evenings were quiet; he avoided public functions except for concerts and almost never traveled, but he and his wife often entertained his senior students, and on most Sundays they had his assistants in to dinner.

At home he was genial, if formal, but at the university dogmatic and pedantic; he acted like, and saw himself as, an eminence. At his lectures—the most popular in the university—he waited until everyone was seated and his assistants had filed in and taken front seats. Then the door swung open and in he strode, impressive in his black academic robe, looking neither to right nor left as he marched down the aisle and up the steps of the platform, where he took his time arranging his chalk and papers, and at last faced his expectant audience, leaned on the lectern, and began talking.

He spoke fluently and fervently, without looking at his notes, and although on paper he was often turgid, ponderous, and obscure, when lecturing he could be entertaining in a heavy-footed academic way, as in his lecture on the mental powers of dogs:

I spent a great deal of time trying to discover some positive indication in the actions of my own poodle of the presence or absence of general experiential concepts. I taught the dog to close an open door in the usual way by pressing with the

forefeet when the command “Shut the door” was given. He learned the trick first of all on a particular door in my study. One day I wished him to repeat it on another door in the same room, but he looked at me in astonishment and did nothing. It was with considerable trouble that I persuaded him to repeat his trick under the altered circumstances. But after that he obeyed the word of command without hesitation at any other door which was like these two...[However, although] the association of particular ideas had developed into a true similarity-association, there was not the slightest indication of the presence in his mind of the principal characteristic of the formation of concepts—the consciousness that the particular object vicariously represents a whole category of objects. When I ordered him to shut a door which opened from the outside, he made just the same movement—opened the door, that is, instead of closing it, and though I impatiently repeated the command, he could not be brought to do anything else, although he was obviously very unhappy at the ill success of his efforts.¹¹

That is as far as Wundt ever unbent; even the admiring Edward Titchener, one of Wundt’s most devoted disciples, found him usually “humorless, indefatigable, and aggressive.”¹² Being possessed of encyclopedic erudition, he saw himself as the Authority. As William James caustically wrote to a friend,

Since there must be professors in the world, Wundt is the most praiseworthy and never-too-much-to-be-respected type of the species. He isn’t a genius, he’s a professor—a being whose duty is to know everything, and have his own opinion about everything, connected with his [specialty].¹³

With his graduate students, Wundt was helpful, concerned, kindly— and authoritarian. At the beginning of the academic year, he would order the students in his graduate research seminar to assemble at the institute; they would stand before him in a row and he would read a list of the research projects he wanted to see carried out that year, assigning the first topic to the first student in the row, the

second to the second, and so on. According to Raymond Fancher,

No one dared to question these assignments, and the students went dutifully off to conduct their research—which in most cases became their doctoral theses...[Wundt] supervised the writing of the report[s] for publication. Though he occasionally permitted students to express their own views in their reports, he often exercised his blue pencil. One of his last American students reported that “Wundt exhibited the well-known German trait of guarding zealously the fundamental principles of his standpoint. About one-third of my thesis failed to support the Wundtian doctrine of assimilation, and so received elimination.”¹⁴

It is only fair to add that in his later years Wundt became relatively mellow and grandfatherly. He enjoyed playing host, in his study, to younger people after his lectures and reminiscing about his early experiences. He taught, wrote, and supervised psychological research until

his retirement at eighty-five in 1917, and thereafter was busy at his writing until eight days before his death, at eighty-eight, in 1920.

The Curious Goings-on at Konvikt

If we visit Wundt’s laboratory in imagination, either in its one-room or later embodiments, and watch experiments being conducted, we will think them curiously trivial, or at least limited to what look like trivial mental phenomena; they explore none of what we usually consider the more intriguing areas of human psychology—learning, thinking, language skills, the emotions, and interpersonal relations.

We see Wundt’s students and occasionally Wundt himself spending hours listening to a metronome; they run it at speeds ranging from the very slow to the very fast, sometimes stopping it after only a few beats, sometimes letting it run for many minutes. Each time, the listeners examine their sensations closely and then report their

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conscious reactions. They find that some conditions are pleasant and some unpleasant, that rapid beats create a touch of excitement and slow beats a mood of relaxation, and that they experience a faint sense of tension before each click and a faint sense of relief afterward.¹⁵

This seemingly insignificant exercise is serious business; it is training in what Wundt calls introspection. He means by it something very different from the introspection practiced by philosophers from Socrates to Hume, which consisted of thinking about their thoughts and feelings. Wundtian introspection is precise, circumscribed, and controlled; it is confined to what Wundt calls the “elements” of psychic life—the immediate, simple perceptions and feelings aroused by sounds, lights, colors, and other stimuli. The experimenter provides these stimuli and observes the subject’s visible reactions, while the subject focuses his attention on the perceptions and feelings the stimuli generate in him.*

Such introspection is a crucial part of many experiments in Wundt’s laboratory, the most common being reaction-time research. Like Donders, Wundt and his students often

measure the time needed to respond to different kinds of stimuli, in the effort to discern the components of psychic processes and the connections among them.

Many of the experiments we see taking place are somewhat like the very first one in that laboratory, Max Friedrich’s. Hour after hour, day after day, an observer causes the ball to drop to the platform, making a sharp noise and closing a contact that starts the chronoscope. As soon as the subject hears the noise, he presses the telegrapher’s key, stopping the chronoscope. Such experiments usually come in at least two forms. In one, the subject is told to press the key as soon as he is clearly aware of his perception of the sound; in a second form, he is told to press the key as soon as possible when the sound occurs. In the first case, the instructions focus his attention on his own perception; in the second case, on the sound itself.

The casual onlooker might see little difference between the two cases, but the researchers, after a great many trials and chronoscope readings, find that the first kind of reaction, involving awareness of one’s perception of the

sound followed by a conscious voluntary response, usually takes about two tenths of a second; the second kind, involving a purely muscular or reflexive response, takes only about one tenth of a second.¹⁶

These findings seem like mere crumbs of psychology, but there are other differences, more revealing than duration, between the two forms of the experiment. The subjects, having been trained in introspection, report that when their attention is focused on their awareness of hearing the sound, they experience a clear, though fluctuating, mental image of what they expect to hear, a minor, wavering sense of strain, mild surprise when they hear the sound, and a strong motivation to press the key. In the reflexive form of the experiment, on the other hand, they experience a feeble mental image of the expected sound, a considerable sense of strain, strong surprise when the ball drops, and an impulse to press the key almost without consciously willing to. Thus the experiment measures not only the different times taken by conscious volition and reflexive volition but identifies the conscious

processes that take place in the self-aware version of this simple act.¹⁷

Despite the focus on conscious mental processes, the researchers look only at the basic components of those processes. Wundt had boldly proclaimed years earlier that experiments could explore the psyche, but now he feels that they can do so only for sensations or perceptions and feelings—the elemental materials of consciousness—and the connections among them. He says that higher mental processes, including complex thoughts, are “of too variable a character to be the subjects of objective observation.”¹⁸ He argues that language, concept formation, and other high-level cognitive functions can be studied only by observation, particularly of general trends among groups of people.¹⁹

Wundt defines a scientific psychological experiment as one in which a known, controlled physiological stimulus—the “antecedent variable,” he calls it—is applied and the individual’s responses observed and measured. Helmholtz and others had already done that but confined their

observations to the individual's visible reactions; Wundt's great contribution is the use of his kind of introspection to gain quantitative information about the subject's conscious inner reactions, though he limits these to the simplest feeling states.

During the laboratory's first two decades, about a hundred major experimental research studies and numerous minor ones were conducted there. Many dealt with sensation and perception, and were generally along the same lines as the work of Weber, Helmholtz, and Fechner. But the laboratory's most original and important findings came from its studies of "mental chronometry," the measuring of the time required by particular mental processes and the interactions among them.

Still others introduced a number of complications in order to invoke and measure a variety of mental processes. For instance, by having several possible stimuli and responses—a stimulus might come in any of four different colors, each calling for a different kind of response—the experimenter could extend the inquiry to include discrimination and choice.²⁰

Other studies concerned the boundary between perception and apperception. In a notable one, the experimenter flashed a group of letters or words very briefly through a slit in a revolving drum; the subject "perceived" them (saw them at the periphery of awareness, without having time to recognize them) but in the next instant "apperceived" (consciously remembered and recognized) some of what he had seen. The major finding was the size of the attention span: most subjects could apperceive and name four to six letters or words after having seen them too briefly to identify them.

A smaller group of studies explored association—not the high-level kind discussed by the English associationists, but the elemental building blocks of association. In a typical study the assistant would call out single-syllable words and the subject would press a key the instant he identified each; this measured "apperception time." Then the assistant would utter similar words and the subject would press the key as soon as each word awakened an associated idea. This took longer. Subtracting the apperception time from the total time yielded a

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measure of what Wundt called “association time”—how long it took the mind to locate a word associated with a heard and recognized word—which, for the average person, is about three quarters of a second.²¹

As the British physicist Lord Kelvin, a contemporary of Wundt’s, used to say, “When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.” The data generated in Wundt’s laboratory definitely met this criterion of knowledge, at least concerning the elementary components of mental processes.

Wundtian Psychology

Wundt saw himself as much more than an experimentalist. In his books and articles he assumed the role of the systematist of psychology and architect of its master plan.

But his system has proven difficult to explicate, and summaries of it differ widely as to its main features.

One reason, according to Boring, is that Wundt’s system is a classification scheme that cannot be experimentally proved or disproved.²² Rather than being the outgrowth of a testable grand theory, it is an orderly pedagogical arrangement of topics based on middle-range theories, many of which could not be explored by the methods used in the Leipzig laboratory.

An even greater obstacle to summarizing Wundt’s system is that he constantly revised it and added to it, so that it is not one thing but many. Indeed, in his time critics could hardly find fault with any part of the system before he either changed it in a new edition of one of his works or moved on to some other topic. William James, though he admired Wundt’s laboratory work, complained that his profusion of writings and viewpoints made him unassailable as a theorist:

Whilst [other psychologists] make mincemeat of some of his views by their criticisms, he is

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meanwhile writing another book on an entirely different subject. Cut him up like a worm, and each fragment crawls; there is no *noeud vital* in his mental medulla oblongata, so that you can't kill him all at once.²³

Yet if no central theme is visible in Wundt's psychology, it is possible to name some of its recurring themes.

One is psychic parallelism. Although Wundt has often been labeled a dualist, he did not believe that anything called mind existed apart from the body. He did say that the phenomena of consciousness parallel the processes of the nervous system, but he considered the former to be based on combinations of actual neural events.²⁴

Another theme is his view of psychology as a science. At first he proclaimed that it was, or could be, a *Naturwissenschaft* (natural science), but later said that it was largely a *Geisteswissenschaft* (science of the spirit—spirit not in the sense of incorporeal soul but of higher mental activity). He said that only the experimental study of immediate experience was a *Naturwissenschaft*; the rest

was *Geisteswissenschaft*. He wrote at length about individual and social psychology and related social sciences, but descriptively and without admitting or even recognizing that rigorous experimental methods could be developed in these fields.²⁵

The most nearly central doctrine of Wundtian psychology is that conscious mental processes are composed of basic elements—the sensations and feelings of immediate experience.²⁶ In his early writings Wundt says that these elements automatically combine to become mental processes, somewhat as chemical elements form chemical compounds. But later he says that the chemical analogy is inaccurate and that the compounding takes place not as in chemistry but by means of attention, volition, and creativity.

Although immediate experience has its rules of causality—particular stimuli cause particular elemental experiences—mental life has its own kind of causality: The mind develops, and ideas follow each other, according to specific laws. Wundt had special names for these laws, but

essentially they were his reformulations of association, judgment, creativity, and memory.²⁷

Another major theme in his psychology, especially in his later writings, is that “volitional activities” are central to all conscious actions and mental processes; those processes are products of an apperceiving agent that actively *chooses* to think, speak, and act in certain ways. Even simple, unthinking acts are volitional, in his view, although he calls them *impulsive*. Acts resulting from more complex mental processes are volitional and *voluntary*.²⁸ Although this theory did not survive in psychology, it was an effort on Wundt’s part to move beyond the automatism of mechanist psychology and toward a more holistic model.

In sum, Wundt had a broader and more inclusive view of psychology than he is often given credit for. Nonetheless, on balance he was restrictive and confining, leaving out or proscribing many areas that today are commonly accepted as essential parts of the field:²⁹

—He was unalterably opposed to practical applications of psychology; when one of his gifted students, Ernst Meumann, turned to educational psychology, Wundt looked at it as desertion to the enemy.

—He was equally opposed to the use of introspection in any way but his own. He scathingly criticized the work of certain researchers—members of the Würzburg School, of whom we will hear more in a moment—who asked their subjects about everything that had gone on in their minds during an experiment. Such procedures, Wundt said, were “mock” experiments, neither experimental nor introspective.

—He rejected out of hand the beginnings of child psychology on the grounds that the conditions of study could not be adequately controlled, so the results were not real psychology.

—He considered animal psychology a fit subject for ruminations, philosophizing, and informal experiments (such as those with his poodle) but allowed no work with animals to be performed in

—Finally, he was particularly scornful of the psychology of William James, which was far more holistic, insightful, and personally relevant than his own. After reading James’s *The Principles of Psychology*— which was greeted enthusiastically by psychologists throughout the world—Wundt sourly commented, “It is literature, it is beautiful, but it is not psychology.”³⁰

Sic Transit

Nothing about Wilhelm Wundt is as curious as his influence on psychology—paradoxically vast and yet very minor.

Vast:

—He was the encyclopedist and systematist of the field; he drew the intellectual map of the territory and defined it as a new domain of science.

—He personally trained many of the people who became the leading psychologists in Germany and the United States during the first decades of the new science.

—He assembled from the scattered beginnings of physiological psychology a distinct methodology for experimental psychology. His laboratory and its methods were the model for many of those established during the next half century.

—Through his immensely authoritative textbooks, he influenced most of the first two generations of American psychologists and their students. During the early part of the twentieth century, the majority of American students of psychology could trace their historical lineage back to Wundt.³¹

And yet very minor:

Wundt's ideas play little part in contemporary psychological theory. The principal reasons:

—Wundt wrote on every imaginable branch of psychology, including many not amenable to his own experimental methods, such as psychic causality, hypnosis, and mediumship. As a result, certain young psychologists saw him as something of a dualist and meta-physician, and thereupon adopted even more rigorously positivist criteria for those psychological phenomena which could be investigated scientifically.³² Their views would be embodied in behaviorism, which would regard introspection, even of the Wundtian kind, as unscientific and valueless.

—Many other psychologists, however, reacted against what they saw as the excessive narrowness and rigidity of Wundtian psychology. They were drawn to areas of research with practical applications, among them child psychology, educational psychology, psychological testing, and

clinical psychology. All these fields, though beyond the Wundtian pale, grew and prospered.

—Certain new schools of research psychology emerged during Wundt's later years as protests against characteristics of his system. These schools had in common the view that experimental psychology should not be limited to the elemental components of immediate experience but should explore higher mental processes.

Such as memory. At the University of Berlin, Hermann Ebbinghaus (1850–1909) invented a method of investigating memory processes that eliminated subjectivity and the effects of the individual's previous experiences. He created twenty-three hundred nonsense syllables—meaningless combinations of two consonants separated by a vowel, such as *bap*, *tox*, *muk*, and *rif*—and used them in a series of memory experiments.

He would read a list of the syllables, for instance, then recall as many as he could. By varying the conditions—the

length of the list, the speed at which he read it, the number of times he read it—he rigorously explored such issues as how the number of items is related to the speed with which they can be memorized (the difficulty of memorizing the list increases far faster than its length), how forgetting is related to the time lapse between learning and recall, the effect on learning and forgetting of repetition and review.³³

So dedicated was Ebbinghaus to his research that he subjected himself to almost incredible labors. In an effort to determine how the number of repetitions affects retention, for instance, he rehearsed 420 lists of 16 syllables 34 times each, a total of 14,280 trials—an Edmond Dantès of psychology, scratching his way through the walls of a Château d’If of research. His method, dreadful as it sounds, was so successful that it has been a staple of the armamentarium of experimental psychology ever since. (In recent decades, to be sure, the predictions he derived from his work have dwindled in importance; the emphasis on memory research in recent decades has been on meaningful rather than meaningless learning.)³⁴

George Elias Müller (1850–1934), at the University of Göttingen, added introspection to Ebbinghaus’s method in order to examine the mental processes behind the statistical findings. Müller found that the recall of nonsense syllables, far from being related solely to the length of the list, the number of repetitions, and similar factors, was in considerable part contingent on his subjects’ active use of stratagems of their own, such as the groupings, rhythms, and even consciously contrived meanings they had imposed on the nonsense syllables. Learning, in short, is not a passive process but an active and creative one.³⁵ These findings, too, helped free psychology from the limits imposed on it at Leipzig.

Certain other psychologists, including some of Wundt’s students, developed even more radical methods of experimental research. Oswald Külpe (1862–1915), though he took his degree under Wundt and was his assistant for eight years, came to think that not only memory but many other thought processes could be studied in the laboratory. In 1896, he founded a psychological laboratory at the University of Würzburg

that soon was second in prestige only to Wundt's, and he and his students became known as the Würzburg School. Their distinctive contribution was the use of "systematic experimental introspection," in which the subject reports not just sensations and feelings but all the thoughts he had while performing a mental task.

Külpe used this method to test Donders's hypothesis that complex mental processes consist of simple ones linked together; it revealed that the addition of mental steps to a reaction-time experiment often changed the nature of the thought process altogether, yielding a reaction time different from the simple addition of all the steps involved.³⁶

The work of others in the Würzburg School—Karl Marbe, Narziss Ach, and Karl Bühler—made its name synonymous with the experimental study of human thought.³⁷ In a typical Würzburg experiment, a subject might have been given a stimulus word and asked to produce an associated word that was more comprehensive, or else an associated word that was more specific. If the stimulus was, say, "bird," a "superordinate" (more

comprehensive) association might be "animal," a "subordinate" (more specific) one "canary." Afterward the subject recounted everything that had gone on in his mind during the few seconds it had taken him to perform the task—his recognition of the stimulus word, his reaction to the task, the appearance of mental images aroused by the stimulus word, the search for the appropriate response, and the appearance of the appropriate word.³⁸ These recollections, written down, were analyzed for clues as to how memory works.

(In recent years this very method has been used by artificial intelligence specialists to create "expert systems"—computer programs that simulate human problem-solving activities such as medical diagnosis by replicating, in computer language, the steps of reasoning used by human experts.)

A curious discovery made by members of the Würzburg School was that subjects sometimes found no trace of mental imagery in their introspection. Adding or subtracting numbers, for instance, or making a judgment as to whether a statement was true or false, might involve

no images. The researchers called this phenomenon “imageless thought”; it showed that, contrary to Wundtian theory, some thought processes are not composed of elemental sensations and perceptions.³⁹

A researcher named Henry Watt made another of the Würzburg School’s valuable discoveries. He found that if he told a subject what the task was—perhaps “Find a superordinate word”—before giving him the stimulus word, introspection would show that the subject had not searched for the superordinate word but that it simply appeared of itself. Watt had discovered the effect of a “determining tendency” or, as it came to be more generally known, “mental set”—the mind’s preparedness to perform a task by unconscious means.⁴⁰

In these and other ways the Würzburg School expanded experimental psychology far beyond Wundtian boundaries and led the move toward a more holistic psychology.

By the 1920s Wundtian psychology was fading from the scene. Professor Ludy T. Benjamin, a leading historian of

the field, sums up what became of it:

In the end, Wundt’s psychology, and that of his contemporaries, was replaced by newer psychological approaches. Although parts of this psychological system exist in modern psychology...we continue to remember him principally for his vision in seeing the promise of a science of psychology and then taking the giant steps required in the nineteenth century to establish the discipline.⁴¹

But, he adds, recent scholarship has shown that Wundt had “a depth of understanding and breadth of interest (e.g., his writings on culture, law, art, language, history, and religion)” that have long been overlooked.

For all that, Boring’s evaluation of Wundt, first made over seventy-five years ago and repeated in 1950, seems unassailable:

Ebbinghaus and not Wundt... had the flash of genius about how to investigate learning. So too with the other great problems of emotion, thought,

will, intelligence, and personality, which were to be successfully attacked sometime and for which the Wundtian laboratory was not yet ready. We need not, however, despise our heritage because, with its help, we have in time advanced far beyond it.⁴²

* I use “his” and “him” here because for many years Wundt had no female graduate students. —M.H.

Zobrazit plochu