

WUNDT'S LABORATORY AT LEIPZIG IN 1891

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This article describes Wundt's laboratory at Leipzig in 1891 as viewed by a Belgian psychologist, J. J. Van Biervliet (1859–1945). Although few French-speaking psychologists worked in Wundt's laboratory, several of those who did reports wrote on how students were trained there. Van Biervliet decided to visit Wundt's laboratory at Leipzig in order to strengthen the foundation of his own laboratory at the University of Ghent and to become familiar with Wundt's experimental techniques. A translation of J. J. Van Biervliet's (1892) article "Experimental Psychology. Wundt's Institute at Leipzig" is presented here as one of the first and most complete articles in French describing the functioning of Wundt's laboratory.

The founding of the laboratory of Wilhelm Wundt (1832–1920) at Leipzig in 1879 was an important event in the history of psychology (Bringmann & Ungerer, 1980). For many years the best published sources that historians had concerning Wundt's laboratory were the various short sketches presented in the 1921 document "In Memory of Wilhelm Wundt" (Baldwin et al., 1921) and Wundt's own memoirs (Wundt, 1920), which appeared more than 40 years after he founded his laboratory. However, more recently, several articles and books were published marking the 100th anniversary of the laboratory (e.g., Bringmann & Tweney, 1980; Rieber, 1980). Among these, Sokal (1980) presented primary documents left by two Americans who studied with Wundt in the 1880s and 1890s, James McKeen Cattell (1860–1944) and George Malcolm Stratton (1865–1957). As shown in the present article, a translation of a French document written in 1892, French-speaking psychologists can also contribute to a better understanding of Wundt's laboratory.

Among the students involved in Wundt's laboratory, few earned a Ph.D. at Leipzig; most of them came for one or two semesters to study the experimental techniques used and then returned to their former university (see Tinker, 1932). This rapid training was the rule among French-speaking psychologists (French, Belgian, and Swiss): To our knowledge, in the last third of the 19th century, the only one who did a Ph.D. with Wundt was the Belgian Armand Thiéry, who was sent to Leipzig in 1892 by Désiré Mercier (1851–1926) to train himself to become the director of the new laboratory founded at the Catholic University of Louvain

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(see Miziak, 1980, for more details). However, it is important to note that in French-speaking countries, and especially in France, a Ph.D. obtained in Germany was not accepted or considered important. Many reasons (among them, pedagogical, political, and institutional) could explain this fact, but the main reason was that there was little interest in Ph.D.s in psychology, and the creation of new positions by universities and governments was exceptional at that time (see Brooks, 1993). We can cite the case of Alfred Binet (1857–1911), who never succeeded in getting a position as a lecturer. There was also the case of a brilliant student of Binet, Victor Henri (1872–1940), who completed a Ph.D. in Germany under the supervision of Georg Elias Müller (1850–1940) (see Nicolas, 1994). Back in France, Henri never found a position in psychology: He had to give up psychology and go into chemistry and physics in order to teach at the Sorbonne!

Very few French-speaking persons worked in Wundt's laboratory at Leipzig. Several philosophers traveled to Germany and brought back information for their students concerning the education in philosophy at the University of Leipzig (see Lachelier, 1881; Ruysen, 1894; Séailles, 1883). Only Emile Durkheim (1886, pp. 429–430) gave some historical information concerning the laboratory but did not describe it in detail. Among future psychologists, the Swiss Théodore Flournoy (1854–1928) was the only French-speaking person to observe the founding of Wundt's laboratory at Leipzig in 1879 (see Nicolas & Charvillat, 1998). Unfortunately, he did not publish anything concerning his stay in Leipzig. Among French psychologists, Benjamin Bourdon (1860–1943) was the first to work in Wundt's laboratory, in 1887 (see Nicolas, 1998a). However, his correspondence with his family and the memoirs he left (see Nicolas, 1998b) do not tell us much about the functioning of Wundt's laboratory. In contrast, Victor Henri provided many details concerning Wundt's laboratory in a famous article on German laboratories (see Henri, 1893) for the journal *Revue Philosophique*, which was directed by Théodule Ribot (1839–1916).

Before publication of Henri's article, two Belgian psychologists published documents concerning Wundt's laboratory at Leipzig. Georges Dwelshauvers (1866–1937) did experimental research during the summer semester of 1889 under the supervision of Wundt (see Dwelshauvers, 1891). (He went on to found three laboratories of psychology, the first one at the Free University of Brussels in 1897, the second one at the University of Barcelona in 1922, and the third one at the Catholic University of Paris in 1925). Dwelshauvers published the results he obtained during his stay at Wundt's laboratory in a monograph (Dwelshauvers, 1890). There, he described the experimental techniques and the apparatus used to measure reaction times, but unfortunately he did not give details concerning the structure and the organization of the laboratory.

The most detailed document we possess is an article published by the Belgian psychologist Jules-Jean Van Biervliet (1859–1945). A translation of that article follows this introductory note. Van Biervliet was born into a family of academics: His grandfather, his uncle, and his brother were professors at the University of Louvain, and his father was a doctor and a member of the Royal Academy of Medicine. After he studied humanities at the Collège St. Louis in his native city of Bruges, he went to the University of Louvain, where he became doctor in philosophy and literature in 1882 and doctor in sciences in 1887. In 1890 he was

appointed assistant professor at the University of Ghent, then full professor in 1894. In 1910 he was elected to the Royal Academy of Belgium in the literature section, and he became a permanent member in 1919. His major field of interest in psychology was memory (see Van Biervliet, 1893, 1900, 1902, 1904, 1907). However, his experimental work on memory was not very well known by the scientific community (for a biography, see De Montpellier, 1979).

It was in order to strengthen the foundation of his own laboratory at the University of Ghent, which he founded in 1890, that Van Biervliet decided to visit Wundt's laboratory at Leipzig in 1891 and to become familiar with Wundt's experimental techniques. He was thus trained by Wundt and his assistants, Oswald Külpe (1862–1915) and August Kirschmann (1860–1932) to use experimental equipment and to run the laboratory. He also met, among others, Edward Bradford Titchener (1867–1927), Frank Angell (1857–1939), Eduard Aloysius Pace (1861–1938), Edward Scripture (1864–1945), Lightner Witmer (1867–1956), and perhaps William A. Hammond (1871–1938) (see Benjamin, Durkin, Link, Vestal, & Acord, 1992).

Van Biervliet describes Wundt's original laboratory, which was relocated in July 1892 (see Henri, 1893) when demolition of the old university buildings began. For more than 4 years, the laboratory was housed in the old institute of Trier on the third floor of the Haus Grimm at the famous Grimmaischer 12 (see Bringmann, Balance, & Evans, 1975), before moving in December 1896 into a new building designed by Wundt himself (see Stratton, 1896). Van Biervliet's account adds to the information presented by contemporaneous works in English—Krohn's (1892) article on apparatus and Cattell's (1888) and Titchener's (1892) articles on the work done at Leipzig—because it concerns specifically the organization of Wundt's laboratory.

Translation

Van Biervliet, J. J. (1892). *Experimental Psychology: Wundt's Institute at Leipzig. Revue de L'Instruction Publique (Supérieure et Moyenne) en Belgique, XXXV, 181–190.*

I.

Experimental psychology, developed just a few years, has already produced encouraging results full of promise. We can cite the work done by Messrs. Fechner, Hering, Helmholtz, Wundt, Ebbinghaus in Germany; Galton in England; Féré, Beaunis, the schools of Charcot and Bernheim in France; Sergi in Italy; Delboeuf in Belgium.

This evolution of psychological science requires a revolution in the way it is taught. In France the courses of Messrs. Ribot and Beaunis, and in Belgium the philosophical circle of Mr. Delboeuf, allowed an initiation to this new science for a small number of privileged persons; but the first institute of experimental psychology, the first laboratory of research open to students, was founded at Leipzig by the famous physiologist and psychologist W. Wundt.

Thanks to the generosity of the Saxon government, Mr. Wundt was able to fit out premises, buy essential measuring apparatus, and give the first practical training in psychology. The Leipzig institute, founded about 10 years ago, includes at the moment a relatively large number of workers. During the last summer

semester, 24 young persons, among them 8 foreigners, did original research under the close supervision of Mr. Wundt. Several former students of the master have founded laboratories similar to the one at Leipzig at universities such as Göttingen, Freiburg, and Bonn. A very modest laboratory is directed by Professor Ebbinghaus at Berlin. The Americans, always numerous at Wundt's institute (there were five of them last summer), have founded about 20 institutes of psychology in their own country. However, Leipzig remains the center in which the most numerous and important works are done.

Before founding at the University of Ghent the laboratory that the generosity of the government and the kind support of the academic authority allowed us to found, we wanted to see the installation of the institute at Leipzig and to understand how it works.

The distinguished professor, as well as his assistants Messrs. Külpe and Kirschmann, introduced us with the greatest kindness to the smallest details of their scientific installation. We address them our sincere and deep gratitude.

II.

The institute or seminar of experimental psychology founded and directed by Mr. Wundt consists of three components: an introductory course, both theoretical and practical; research work; a library.

The Introductory Course

The young people who intend to tackle issues of experimental psychology come to the institute with very different backgrounds of theoretical preparation and practical training. In addition to medical students and candidates for a Ph.D. in science, there are philosophy students, lawyers, and even professors of primary education.

The goal of the introductory course is to introduce this heterogeneous group to the specific aspects of experimental work, to familiarize the newcomer with the main apparatus used in the laboratory, and to discuss and criticize the various methods used until now in the collection of data. This course, limited in time—it contains only 15 sessions—is repeated every 6 months. Thus, every semester new students attend the seminar of psychology.

Dr. Külpe is in charge of this preliminary course. The course, intended for a necessarily restricted audience, is conducted in an informal manner. The professor has in front of him the apparatus, for which he explains the use and the function. A blackboard, nearby, allows the professor to draw curves, to do arithmetic. The audience is often questioned on the way it would run an experiment, to avoid setbacks. The professor discusses the answers, shows the weak point, then himself gives the required answer. The audience is allowed to interrupt the professor, to raise objections, to ask for clarifications. The end of the course is often devoted to running a series of experiments with the apparatus previously described, applying the methods just discussed.

When the introductory course is nearing its end, Mr. Külpe proposes to his audience two or three subjects of original research. The students have 8 days to develop a design, to determine the technical arrangement, to choose the methods that, according to them, will give the best solution to the problem.

The last two sessions are devoted to a detailed examination on the different

propositions given during the course. This sort of examination allows the professor to estimate the benefit the students have gained from the introductory course.¹

The Research Work

The premises assigned for practical work in psychology are located on the second floor of a building that is an annex of the university and is called the Konvikt. There is first a series of five rooms, including (1) an antechamber; (2) a darkroom for psychophysiological research on vision; (3) two rooms containing electromagnetic instruments used for various experiments, in particular for research on attention; these rooms contain also, in glass cupboards, maps, reproductions of anatomical pieces, and demonstration models used for lessons; (4) a reading room containing the library.

Two other rooms are located to the left of this row of rooms, separated by a large corridor. The first room is saved for experiments that do not require electricity. The second one, the most easily isolated, corresponds to what we call the reaction chamber. It is in this room that a subject reacts to visual or auditory sensory impressions. Here are located the apparatuses intended to produce, under precise and determined conditions, sensory excitations, either luminous or sonorous. Response buttons enable the subject to react in order to record, via an electric transmission, the precise time when he perceives the sensory excitation. This isolation of the subject is essential to the success of the experiments. Completely separated from the experimenter, the subject cannot be influenced by him, and he acts with a complete independence.

In the different rooms, blackboards allow experimenters to sketch out the schema of the device used, to note the obtained results, and so forth. Each of the seven rooms of the laboratory has a number. Each series of research is done in one or two rooms chosen in advance.

The technique of work followed in the laboratory of Leipzig is, understandably, the physiological technique. However, the apparatuses most frequently used are not exclusively the ones used in a laboratory of physiology. Near the dynamometers, the sphygmographs, recording drums, and so forth, we find a whole group of special instruments used for specific experiments. These apparatuses, mainly designed by Mr. Wundt and constructed following his instructions by C. Krille of Leipzig, are found in all the laboratories of experimental psychology. They are various, but all are electromagnetic. Some of them are intended to produce stimulation at a specific moment, either a luminous or a sonorous stimulation: For instance, the big pendulum, located in the reaction chamber, is the

¹ In addition to the introductory course, Dr. Külpe gives a course in experimental psychology, not to be confused with the course given by Mr. Wundt. The course in experimental psychology is what we would call a free course for the Ph.D. It continues through five semesters. It is a detailed and comprehensive overview, both historical and critical, of all the work done until now in the field of experimental psychology. The content of these courses is very rich, allowing students to find new seams to exploit. Mr. Külpe reviews successively the work published on (1) intensity of sensations, (2) their quality, (3) the determination of objective and subjective times, that is, done by the experimenter or the subject during an experiment, (4) the notion of space and the theory of localization, (5) the fusion of sensations, and various quantities and qualities, and the combination of sensations in space and time. We followed a series of very interesting lessons explaining the conditions leading to the more or less complete fusion into a unique sound of two or more sounds produced at the same time.

advanced model, very elegant, of a more primitive model, that was used at the beginning. The swinging triangular cage supports various plates of black sheet metal of varying dimensions. Rectangular openings pierced in the sheets are closed by means of runners sliding along graduated rulers. We thus obtain horizontal or vertical slots that allow us to adjust an opening; a platinum wire connected to the swinging triangle closes the electrical circuit instantaneously, even where the light ray passes in front of a subject's eye. The closing of this circuit removes the needle of the recording apparatus; it thus gives the precise moment at which the excitation is produced.

The electromagnetic hammer gives sonorous impressions. When the sound is produced, a circuit, in closing, removes the needles of the chronoscope, exactly as for the pendulum. Other apparatuses are devoted to measuring the duration of mental phenomena. Hipp's chronoscope is a clock moved by a weight. Two dials divided into 100 units have two needles whose movement can be controlled. The fastest of the two needles covers the 100 degrees of the dial within one tenth of a second. Thus each degree corresponds to one thousandth of a second. When an experiment begins, the needles are stopped by an electromagnet. When the luminous or sonorous stimulation is produced for the subject, the current is cut off and the needle, freed, starts to move. When the subject reacts by pushing the button near him, the current is turned on again and stops the needle. We thus know exactly, with the precision of one thousandth of a second, the time taken by the stimulation to reach the perceptive center of the brain, from here to reach the motor center, and to produce the voluntary movement of the hand on the response button. This time recorded by the chronoscope is what we call the physiological reaction time. It is about one eighth to one fifth of a second for the different kinds of sensations. It varies with subjects.

Other very ingenious apparatuses have been built in order to continue special researches; their number will always increase.

To provide for the numerous needs of the laboratory, Mr. Wundt has an annual sum of money of only 1,500 Deutschmarks at his disposal; it is really insufficient to equip a laboratory composed each year of more than 20 persons. So it would be wrong to expect to find luxurious installations at Leipzig. Some Americans told us that laboratories of psychology in the United States are far better equipped. That is possible, but we doubt we will ever find such a throng of students, a diversity of works, a distinguished supervision that make the Leipzig institute a model school, to which the Americans themselves send the cream of their students, their future professors of psychology.

Invariably every day, Mr. Wundt spends his afternoon in the laboratory. From time to time he visits the groups of workers; always simple and affable, he listens to the remarks, examines the installations, criticizes a detail, suggests an improvement. The two assistants, Dr. Külpe and Dr. Kirschmann, help the master to supervise the research. Every day, from 2 to 7 p.m., sometimes in the morning, we find them at their posts, helping, criticizing, counseling, working in several groups.

Indeed, workers are organized by groups. At the beginning of each semester, students attending the seminar in experimental psychology meet under the presidency of the director of the institute. Each student proposes, if he wants to, a research project, puts forward some ideas about the way to treat the subject. After

discussion, Mr. Wundt decides which of the projects will be pursued. For each project, we name a chief experimenter; some assistants if necessary; then one or several subjects. The experimenter, head of the group, is generally an experienced person; having worked at the laboratory for several semesters, he is familiar with psychophysiological techniques. The apparatuses are familiar to him, the electricity has no more secrets for him. If the reader remembers how workers are recruited, he will understand the necessity of this organization. Besides the physicists and the physiologists, always relatively rare, we find a large number of students in philosophy and law. These students are able to supervise research only after a long initiation, after devoting two or three semesters, either as a subject or as an assistant experimenter, to becoming familiar with the special apparatus used at the institute.

The head of a group is an important person; the success of the project depends largely upon him, his persistence, precision, initiative, sagacity. The subject or the subjects also have an important role in this success; the fundamental quality required from them is absolute sincerity. A subject must above all be conscientious; he must react naturally without bias, especially without preconceived ideas. Last summer, we deeply admired the sincerity, the honesty of the subjects who reacted in the different groups. The subject is not always the same. To test a law, it is very often necessary to use a series of subjects. So the assistants, the fellow students of the workers, even the foreigners often serve as subjects for the experiments under way.

The groups having been constituted, the projects distributed, we designate the rooms in which the workers will conduct their projects, the days and the time when they will meet. A board summarizing this information is suspended at the entrance of the building.²

The different groups of workers install their apparatus, check the correct functioning, then, after a trial period, start the experiments. All the results are scrupulously written down, and not only the results, but all the circumstances, although they might be few, responsible for the variations of *objective* conditions, that is to say external incidents, and *subjective* conditions, that is, the subject's mood. It is when the time has come to draw conclusions from a long series of experiments that we congratulate ourselves for noting regularly any incidents.

Very often, almost always, we discover in these data unsuspected relationships, completely new aspects, and these are not always the least important part of the studied question. Besides, the notebook is essential when research has succeeded and we want to publish the results.

The works of Mr. Wundt, of his assistants, and of his students are published in a special review, *Philosophische Studien*. Seven big volumes of about 700 pages each, published in less than 10 years and containing many original and interesting works, clearly reveal the fecundity, the tireless fervor of the members of the seminar of experimental psychology and the energy of the institute founded by Mr. Wundt.

² At first glance it might seem odd to choose predetermined days and a time for scientific work. Generally, in our laboratories, the free students can work whenever they want to. Thinking about it, we better understand the German system: Psychological research requires a constant patience and calm. Work divided into short and equal periods, not too close, will be regular and sustained enough to give results.

The Library

The necessary complement of experimental installations is a good library containing first the main technical treatises, dictionaries, practical handbooks, where the student can at any moment find the essential information, find the solution to an unexpected difficulty, refresh his ideas about a specific law. Next to this essential collection, the library must possess the various special works published in the field, especially the journals keeping the psychologist informed about the scientific evolution and the progress made in different countries in all the fields that are of interest to him.

Leipzig's library is supported solely by a semestral stipend given by the members of the seminar.

Among the books in the collection, next to purely philosophical works of Leibnitz, Kant, Herbart, Schopenhauer, we find the works of Fechner, Stumpf, Ribot, Preyer, Taine, Bain, Spencer, Delboeuf, Bucola. The treatises of physiology by Hermann and Wundt, the medical physic of the same author, the works of Helmholtz, the archives of physiology from Pflüger, and so forth.

All the important journals of psychology are at the students' disposal. The reading room is open every afternoon. Silence is required in this room. No book from the library, no issue of any journal can be taken outside the library by users.

At a time when the various Belgian universities seem to agree on the necessity of following in the teaching of psychology the new orientation taken by this science, we believed it useful to draw attention one more time to what has been done in Germany for the science we are interested in. That is the reason why we tried to describe, as we saw it working, the institution considered by the Germans as the typical institute of experimental psychology.

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