

Founding fathers

David K. Robinson on an important meeting of minds at Leipzig University

In terms of personalities and psychological method, Gustav Theodor Fechner (1801–1887) occupies a critical position in the history of psychology, between the pioneering sensory physiologist, Ernst Heinrich Weber (1795–1878) and Wilhelm Maximilian Wundt (1832–1920), father of experimental psychology. All of them taught at Leipzig University, where the two elderly professors, long retired from lecturing, were there to welcome Wundt as he arrived in 1875 and began to build the Institute for Experimental Psychology. This is their story.

Operational by 1879, the Institute for Experimental Psychology at Leipzig University functioned as the world's first graduate programme in psychology. According to one biographer, Fechner greeted Wundt on the occasion of the formal opening of the Institute with these words: 'If you work on such a scale, you will be finished with all of psychophysics in a few years' (Lasswitz, 1896, p.89). In his early career Fechner was well known for his satirical writings, and he always welcomed a good argument about science or philosophy, so it is hard to know whether this was meant as a sarcastic jest, or whether Fechner really entertained such an expectation. As it turns out, both psychophysics and Wundt's larger projects for psychology would never be 'finished'.

Wundt's personal acquaintance with E.H. Weber, who is still remembered for the foundational formula that Fechner transformed into the Fechner–Weber law of psychophysics, was necessarily brief: Weber died within three years of Wundt's arrival in Leipzig. In fact, Wundt moved into Weber's flat in the large university-owned building at Gerberstrasse 6, where he and his family lived from 1878 to 1911 (Robinson 1987, p.66). Weber's former apartment thus briefly (and fittingly) served as the psychological laboratory, until Wundt was given university rooms to store his instruments and materials and to put students to work with them.

Fechner, approaching 80 as Wundt settled into his professorship of philosophy at Leipzig, still had some energy to interact with emerging work in experimental psychology. At the time he was enjoying

local celebrity and increased attention from the scientific world, and it was surely gratifying to Fechner that the Institute for Experimental Psychology took up some psychophysical studies. Since its publication in 1860, Fechner's *Elements of Psychophysics* had slowly but surely gathered a following, and attracted criticism, from a group of physiologists and philosophers, including Wundt, Hermann Helmholtz, Ernst Mach, A.W. Volkmann (brother of Fechner's wife Clara), and others. Fechner answered critics of his classic work by publishing *The Case for Psychophysics* (1877) and *Revision of the Main Points of Psychophysics* (1882); he also published two articles on psychophysics in Wundt's journal, *Philosophische Studien* (the first journal of experimental psychology). After Fechner's death, Wundt and his associates edited and published Fechner's largest posthumous publication, *Theory of Measuring Collectives* (1897), as well as a corrected edition of *Elements of Psychophysics* (1889), which certainly was needed, since the first printing of this classic had been limited (only 750 copies, according to Heidelberg, 2004, p.59).

Although Fechner was an exuberant participant in scientific and philosophical controversies, Wundt tended to be more cautious, but he probably had no way of avoiding one bitter controversy that broke out soon after he arrived in Leipzig. The astrophysicist Friedrich Zöllner had interested Fechner, E.H. Weber, and his brother, the physicist Wilhelm Weber, in the visiting American medium Henry Slade. Expectations of his senior colleagues virtually required Wundt to attend and evaluate Slade's séances, held from November 1877 to January 1878. Wundt's opinion of Slade's psychic powers, however, was decidedly negative. Zöllner, as it happened, had been a strong advocate for experimental psychology during the controversial decision to call Wundt, a trained physiologist, to Leipzig's chair of philosophy, so he felt betrayed and became incensed at Wundt, publishing a vehement polemic against him and others who

questions

Why do many historians consider Leipzig to be the birthplace of modern, experimental psychology?

What were the relationships between psychophysics and early experimental psychology?

resources

Boring, E.G. (1929). *A history of experimental psychology*. New York: D. Appleton-Century.
Heidelberg, M. (2004). *Nature from within: Gustav Theodor Fechner and his psychophysical worldview* (Trans. Cynthia Klohr). Pittsburg, PA: University of Pittsburg Press.

references

- Boring, E.G. (1929). *A history of experimental psychology*. New York: D. Appleton-Century.
- Die Gustav-Theodor-Fechner-Gesellschaft e.V. (2001). *Gustav Theodor Fechner (1801–1887), präsentiert aus Anlaß seines 200. Geburtstages*. CD-ROM. [See also www.uni-leipzig.de/~fechner]
- Heidelberg, M. (2004). *Nature from within: Gustav Theodor Fechner and his psychophysical worldview* (Trans. Cynthia Klohr). Pittsburg, PA: University of Pittsburg Press.
- Kuntze, J.E. (1892). *Gustav Theodor Fechner: Ein deutsches Gelehrtenleben*. Leipzig: Breitkopf & Härtel.
- Lasswitz, K. (1896). *Gustav Theodor Fechner*. In R. Falkenberg [Ed.] *Frommanns Klassiker der Philosophie: Vol. 1*. Stuttgart: Frommann.
- Megte, A. (1977). *Zur Herausbildung der Experimentalpsychologie unter besonderer Berücksichtigung des Beitrages von Wilhelm Wundt*. PhD dissertation, Sektion Psychologie, Universität Leipzig.
- Robinson, D.K. (1987). *Wilhelm Wundt and the establishment of experimental psychology, 1875–1914: The context of a new field of scientific research*. PhD dissertation, University of California, Berkeley.
- Robinson, D.K. (2001). Reaction-time experiments in Wundt's Institute and beyond. In R.W. Rieber & D.K. Robinson [Eds.] *Wilhelm Wundt in history: The making of a scientific psychology* (pp.161–204). New York: Kluwer/Plenum.
- Wundt, W. (1885). *Der Spiritismus, eine sogenannte wissenschaftliche Frage*. Offener Brief an Herrn Prof. Ulrici in

rejected spiritism. Fechner was characteristically more understanding. In perhaps the only extant letter from Fechner to Wundt, Fechner thanks him for his piece on spiritism (1879/1885), adding:

I don't see why we should argue about this anymore; I would rather not argue with you on this subject at all, since we are both convinced that we cannot change one another's opinion on the issues at hand. You will continue to recognize spiritism as something that cannot be investigated, that is not factual, and I will continue to say that it is factual and will try to investigate it. (Fechner to Wundt, 25 June 1879: GTF-Gesellschaft, 2001)

This letter seems to contradict Wundt's later memory of the situation: he blamed the unpleasantness on Zöllner and recalled that Fechner had 'almost involuntarily been made witness to and participant in several spiritualist meetings' (Wundt, 1901/1913, p.340).

In the final analysis, Wundt was part of a sober generation of scientists who were trained after the *naturphilosophisch* bloom was off the rose, but that sweet scent certainly lingered in Fechner's nostrils as long as he lived. To him psychophysics was not simply a useful methodology for approaching some problems in sensory physiology, as Wundt came to believe; it was the way to discover the true connection between matter and mind (or spirit, *Geist* in German). Zöllner was chasing spirits in the fourth dimension, recently revealed by publications on non-Euclidian geometry, but his unpleasant behaviour won him few fans. Fechner, on the other hand, always evoked fond feelings from his younger colleagues. Marking the centennial of Fechner's birth, Wundt (1901/1913) remembered him not

only as the father of psychophysics, but also as a model of scientific and scholarly dedication, to his final days:

His small apartment in Blumengasse in Leipzig carried the stamp of an outwardly very modest, but innerly satisfied existence... On the walls of the room and in even smaller alcoves nearby were a few bookshelves, of raw wood, upon which there were few books but large stacks of manuscripts. Fechner was no longer able to do his own reading, due to many years of eye disease, and although he was supported by friends



Wundt's research group

(particularly females) who would read to him daily, it was a difficult substitute. And so this man, who in his youth had mastered astounding reading of the widest areas, was now forced to depend on himself, particularly on the treasury of his

memory. The book that he used the most was

the table of logarithms... His preferred readings were his own manuscripts, and he was constantly revising them until he was satisfied with them. He started out by writing out his thoughts on loose quarto sheets, totally unreadable by others. This draft would then be revised into a more complete form, which he would finally put in folio, and then maybe revise another time or two. He wrote, in order to ease reading, in very large letters, which he himself could decipher but which his readers often found difficult. He never was able to get used to dictating.

Fechner died on 18 November 1887, and three days later Wundt delivered the eulogy at his funeral (Wundt, 1887); Fechner's nephew included it as an

appendix to his biography of his uncle (Kuntze, 1892).

In Wundt's Institute for Experimental Psychology, the study of sensory capacities and psychological processes engaged not only the Weber–Fechner law, but also psychophysical methods for (admittedly indirect) measurement of sensation: (1) the method of just noticeable differences, or limits; (2) the method of right and wrong cases, or constancy; and (3) the method of average error (Boring, 1929, p.285). Although both Boring and Megte (1977) have made a strong case that Fechner prepared the way for Wundt and experimental psychology by showing how to measure and experiment on psychological processes, Heidelberger (2004, p.233ff.) argues that Wundt himself came to realise that experimental psychology, with its ever-widening vistas, does not have its origins in the narrow methods of psychophysics, but in the broader interests of sensory physiology. Robinson (2001) finds that reaction-time studies were more central to the work and influence of the Leipzig Institute than was psychophysics. In light of this we can perhaps better understand Wundt's modesty in his memoirs (1920, p.38), when he considered who 'fathered' what:

Fechner, who was a few years younger, called Ernst Heinrich Weber the 'father of psychophysics'. I doubt whether this name fits. The creator of psychophysics was certainly Fechner himself. I would rather call Weber the father of experimental psychology... It was Weber's great contribution to think of measuring psychic quantities and of showing the exact relationships between them, to be the first to understand this and carry it out.

Upon his arrival in Leipzig Wundt obviously prospered in Fechner's limelight; to him the kind old man was inspirational and encouraging. However, by the time his own career was ending Wundt realised that Fechner's direct and ambitious approach to measuring the relationship between mind and matter had not reached the intended goal, and could not. Experimental psychology would be a much broader project, certainly something that could not be finished 'in a few years'.



David K. Robinson
is Professor of History at Truman State University, Missouri
drobinso@truman.edu

Halle. In *Essays* (pp.386–416). Leipzig: W. Engelmann. (Original work published 1879)

Wundt, W. (1887). Zur Erinnerung an Gustav Theodor Fechner: Worte, gesprochen an seinem Sarge am 21. November 1887, *Philosophische Studien* 4, 471–478. [Reprinted in Kuntze, 1892. pp.351–361]

Wundt, W. (1913). Gustav Theodor Fechner: Rede zur Feier seines

hundertjährigen Geburtstages. In *Reden und Aufsätze* (pp.254–343). Leipzig: Alfred Kröner. (Original work published 1901)

Wundt, W. (1920). *Erlebtes und Erkanntes*. Stuttgart: Alfred Kröner.