The Psychophysical Ear: Musical Experiments, Experimental Sounds, 1840–1910
by Alexandra Hui (review)

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(Review)

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ticated, fully engaged with current scholarship, and impressively supported by footnotes and references. This means that anyone—novice or specialist—can use it as a starting point for pursuing any number of the lines of thought it has so cogently introduced.

JIM BENNETT


The field of psychophysics is usually seen as a branch of experimental psychology, and the early history of psychophysics (from its origins in the mid-nineteenth century) is usually seen as constituting the beginnings of “scientific” psychology. Alexandra Hui, by contrast, argues that the history of psychophysics during its first decades (1840–1910) was also intimately tied to the making and hearing of experimental sounds and to the musical instruments by which they were created. Her study places great emphasis on the musical instruments and apparatus that a few central scientific figures created (or had created for them), and on the important role of musical aesthetics. She concentrates attention on the well-known psychophysical work of Gustav Fechner, Hermann Helmholtz, Ernst Mach, Wilhelm Wundt, and Carl Stumpf, as well as on the musical aesthetics of Helmholtz, Mach, and Stumpf, and on that of music critics A. B. Marx, Eduard Hanslick, Hugo Riemann, and Eduard Kulke. The result is a fresh but brief and episodic study in which “the psychophysical ear,” and not experimental psychology, stands at the center of historical attention.

Hui stresses the various roles of musical (and other acoustical) instruments, physical and physiological acoustics, and musical aesthetics in shaping psychophysics (before 1910), in particular how various experiments in sound creation and perception helped shaped what she calls the psychophysical ear. Instead of being concerned with psychophysics’ role in shaping the history of psychology, Hui looks instead at psychophysics as a practice and viewpoint that was historically contingent on the material and cultural history of liberal, musically oriented, upper-middle-class German and Austrian scientists and musical critics. To what extent, she asks, did the laws of physics and physiology clash with the contingency (both historical and cultural) of musical aesthetics as practice and theory?

She argues that psychophysics became increasingly attached to the study of the sensory perception of sound. In the course of the period 1840–1910, the new psychophysicists (i.e., Helmholtz, Mach, Wundt, and Stumpf) went
from studying the perception of the threshold of sound to the process of hearing itself, and finally to an individual subject’s sound experience. They did all this, Hui argues, within the context of musical aesthetics. Her viewpoint runs, of course, against the grain of our broad view of the natural sciences as moving increasingly away from an individual’s subjective experience and toward more general, abstract laws.

Both a much older historiographical tradition (initiated by G. Stanley Hall and Edwin Boring) and a far more modern and sophisticated version (led by Mitchell Ash, Kurt Danziger, and others) emphasized psychophysics as a central pathway to the emergence of psychology as an experimental science and thus as essential to appreciating modern-day psychology. Hui, by contrast, seeks to show that the first psychophysicists had rather different goals or at least used means that have not been fully appreciated. In fact, she is not much interested in psychology per se. Instead, she emphasizes the high value that the first psychophysicists placed on the classical musical culture in which they were trained and which they practiced and experienced (i.e., the “possession” of a well-trained musical ear); on the role of musical (and other) instruments in creating and hearing sounds (i.e., the material culture); on appreciating and using musical aesthetics; and on the impact on the psychophysicists of the recent introduction of non-Western music as a challenge to their understanding of music.

Hui’s emphasis on technology and culture (as regards the creation of sounds and of sound perception) is part of a recent historiographical approach that includes the work of Elfrieda and Erwin Hiebert, Myles Jackson, David Pantalony, Emily Thompson, and others. These authors (and now Hui) place greater emphasis on the roles of instruments and acoustics in the historical understanding of sound perception and of music. On the other hand, Hui’s study also belongs to another recent historiographical tradition, one that variously emphasizes the historical nature of sensory perception (Jonathan Crary), attention (Michael Hagner), and objectivity (Lorraine Daston and Peter Galison). Moreover, her emphasis on the convergence (not divergence) of psychophysics and aesthetics places her work alongside that of Deborah Coen and Suman Seth, who have argued that the fin-de-siècle was a stimulating, creative environment and not merely a destructive and disorienting one for natural science.

In her final chapter, Hui discusses the rise of music practice and performance as a mass phenomenon (and its parallel decline in terms of quality) late in the century, and she hints at the rise of musicology and its departures from a natural-scientific approach to music theory. In my view something might also have been said about the introduction of electrical and then electronic apparatus into acoustical (musical) analysis and performance, for this aspect of material culture also shaped our understanding of experimental sounds and their perception. That said, readers of
Technology and Culture will doubtless profit from Hui’s new angle of study into the history of psychophysics.

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At the turn of the twentieth century the Pennsylvania Railroad (PRR), the largest private corporation on earth, employed hundreds of thousands of workers. It reached from the eastern tidewater metropolises of New York, Philadelphia, and Baltimore to the midwestern agricultural and manufacturing heart of industrial America. It influenced the laws and regulatory policies of state and federal governments. It touched many lives, those who worked for the PRR (or simply “the railroad”) as well as those tens of thousands of daily travelers who continue to use Penn Station in New York and the Amtrak Northeast Corridor. The self-described “standard railroad of the world” set the standard for all other railroads and now, finally, has a standard reference book about its early history. Albert Churella has carefully crafted a comprehensively researched history that thoroughly analyzes the contributions of the railroad as a significant corporate and industrial entity. He successfully fits the history of the PRR into the rise of industrial America. Four major themes tie the book together and serve as the organizational framework: organization, labor, technology, and government. The author ably incorporates local, state, and national political events, the Civil War and Reconstruction, organized labor, and the rise of the regulatory regime.

While the subtitle indicates a start date of 1846 and an end date to this volume of 1917, the author looks far beyond. The origins of the PRR extend to the founding of Philadelphia and the colony of Pennsylvania in the 1600s. The early chapters explore the commercial rivalry between East Coast ports and the emergence of the PRR as Philadelphia’s way to tap the trade and commerce of the West. The intricate political maneuvering and some skullduggery that occurred make this an enjoyable read. Once the PRR reached Pittsburgh and secured access to the Ohio River, the engineer-managers at the helm of the firm looked to the fast-growing commercial and burgeoning industrial cities of Cincinnati, Saint Louis, and, most importantly, Chicago. The PRR gained access to those cities and the rich agricultural heartlands of the Old Northwest in a convoluted, but clearly if lengthily explained, process of partnerships, corporate control, and outright merger. Unfortunately for the PRR, the Panic of 1873 cur-