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Susan Schmidt Horning. *Chasing Sound: Technology, Culture, and the Art of Studio Recording from Edison to the LP.*

Chasing Sound: Technology, Culture, and the Art of Studio Recording from Edison to the LP
by Susan Schmidt Horning

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cialization is not all bad, because it produces more and better scholarship; and historians themselves were not the only ones establishing boundaries. Professionalization occurred in associated fields such as archival and state historical studies, spun off from the AHA, as well as in high school teaching and the field of social studies. Personal factors contributed to these splits, as did the growing size, specialization, and almost inevitable fragmentation of historical practice itself. Townsend is somewhat ambivalent about whether academic historians were to blame for this outcome. In any case, he does not cover more recent developments since World War II, which are largely treated as determined by the boundary marking and internally oriented tracks of professionalization that had already taken shape.

Townsend's coverage of this emerging and changing historical profession's composition is more precise and extensive than any other account. He has made excellent use of the voluminous papers of the AHA to provide confidence in his analytical judgments, with extensive quantitative data that could be emulated for, or compared with, other disciplines. To this is added investigation of the papers of prominent historians and historical societies and consideration of the (less extensive and illuminating) archives of the Mississippi Valley Historical Association (MVHA).

The focus is largely on the AHA, even though the MVHA competed with and complemented the AHA's work. Moreover, what ordinary historians did or said outside this professionalizing and institutional context is not centrally considered. This choice reflects the AHA's role as the peak body for history, albeit academic history. Nevertheless, the research does skew the study, because the MVHA catered specifically to American history in the period in question. A larger part of the AHA cohort worked on non-U.S. matters, where the application of historiographical findings and the focus of scholarship made cooperation with other emerging professions and with amateur historians within the United States more marginal if not irrelevant. This trend may not be different from developments in other countries, though the comparison is not made.

Indeed, what is missing is any comparative dimension that might confirm the apparent underlying tendencies of professionalization. The concept is certainly common as a trope in historiography and an important theme in modern American life. But the pace, scope, and outcome may be influenced by a variety of factors within nations—and internationally. Stunted, warped, or catch-up professionalization might well be

examined. For example, ideas of cultural lag, or combined and uneven development, might be applied cross-regionally or cross-nationally, as derived in economic history by Alexander Gershenkron.

Nor does this book tackle wider transformations that could come under the study of historical discourse or the discipline of history. Kuhnian ideas of paradigms or Foucaultian concepts of knowledge/power and epistemic breaks are inapplicable here. The concern is much more institutional. This short review cannot do sufficient justice to the subtleties and nuances of Townsend's interpretation, but the chief value of *History's Babel* is its quantitative dimension and its rigorous approach that could be applied in the disciplinary history of the sciences.

IAN TYRRELL

Susan Schmidt Horning. *Chasing Sound: Technology, Culture, and the Art of Studio Recording from Edison to the LP.* (Studies in Industry and Society.) x + 292 pp., illus., index. Baltimore: Johns Hopkins University Press, 2013. \$45 (cloth).

The history of sound recording has been dealt with in many historical, sociological, and musicological studies; however, the recording studio as the place where music is actually recorded (and produced) has long been overlooked. Susan Horning's monograph *Chasing Sound*, a revised version of her Ph.D. dissertation, sets out to close this gap. Her focus of inquiry is on the role of recording technicians and sound engineers—professions at the margins of craft, engineering, and art. She makes extensive use of rich oral history interviews with engineers, producers, and musicians, archival material from recording studios, and a close reading of trade journals. In seven chapters, which cover the period from the late nineteenth century to the 1970s, Horning vividly analyzes the co-construction of recording technology, studio practices, and musical culture.

For a better understanding of later shifts, she starts with a description of acoustic recording practices and shows how the rather low status of recordists in the age of mechanical recording stood in stark contrast to their important role in the recording process. Recordists' "working knowledge" (Douglas Harper) was crucial for successfully capturing a musical performance. Meanwhile, musicians and musical genres had to adapt their art to the limitations of the recording apparatus. Horning then turns to the first (electrical) revolution in sound recording. Be-

ginning in the 1920s, new electrical recording technology—for example, microphones—made life easier for musicians and enabled new styles of singing like crooning and whispering (e.g., Bing Crosby and Frank Sinatra). New recording technology produced better-sounding records but required a different kind of knowledge—that of engineers, not mechanics—and this paved the way for a new group of actors to enter the business: audio engineers. Electrical recording also increased control, as musical performances now became measurable and visible. Compared to the mechanical recordists' culture of secrecy, the institutionalization of the audio engineering community after World War II facilitated the circulation of recording knowledge and helped to standardize new technologies like the LP—a technology that not only provided more recording time but also better sound quality. With improved microphone technology and microphoning technique, reverberation, once eliminated as unwanted sound, became the acoustical signature of a studio. Furthermore, engineers started to use echo chambers and other technical devices to add artificial reverberation and thus turned the studio into the final instrument that is recorded. This was the first step in a shifting emphasis from song to sound. The next crucial episode in this transition of musical culture was the introduction of magnetic tape recording. Tape recording, in combination with multitrack recording and mixing, completely changed the way artists, producers, and engineers worked together, and musical control shifted from the actual studio to the control room—from artists to engineers. Studio recordings no longer had to rely on good live musicians; instead, untrained studio artists could make as many attempts as necessary to produce a single good recording. In addition, engineers had more and more sophisticated sound technologies at hand to manipulate sounds in the mixing and mastering stages. Studio recordings became musical productions in their own right and established a new musical standard where the definitive version of music was the studio recording rather than the live performance (e.g., The Beatles' *Sgt. Pepper's Lonely Hearts Club Band*).

Horning convincingly argues that audio engineers had a decisive impact on both technical and artistic practices; the "aural thinking" (p. 127) of these sound diplomats shaped musical culture in the "trading zone" (Peter Galison) of the recording studio. However, her story of the co-construction of technology and musical culture sometimes reaches the limits of her geographical focus on the United States. Horning mentions, for example, the importance of Ger-

man tape recorders, microphones (p. 112), and artificial reverberation devices (p. 95), but she does not show how knowledge circulated between American engineers and musicians and the German manufacturers to co-construct these technologies. Despite this minor criticism, *Chasing Sound* is a well-written, fascinating account of the multiple shifts and changes in studio recording—from the art of capturing a live performance to the art of engineering an illusion and the concomitant reversal of the historical relationship between live and recorded music.

STEFAN KREBS

Amy Sue Bix. *Girls Coming to Tech! A History of American Engineering Education for Women.* (Engineering Studies, 2.) xii + 360 pp., illus., bibl., index. Cambridge, Mass./London: MIT Press, 2013. \$34 (cloth).

Since the 1980s, historians of science and technology have established the importance of studying the role of women in those fields. The history of women in the sciences has benefited from the scholarship of people such as Margaret Rossiter. Others, such as Ruth Schwartz Cowan, have explored the history of women in technology. Building on the work of those scholars, as well as that of the historian Ruth Oldenziel, who focused on women as engineers, and Amy Slater, who examined race and engineering, Amy Sue Bix has expanded the historiography of the largely understudied field of women in engineering education. *Girls Coming to Tech! A History of American Engineering Education for Women* is both long anticipated and enthusiastically welcomed.

Just as Rossiter studied the changing educational opportunities for women in the sciences in her monumental *Women Scientists in America*, Bix examines changing attitudes regarding educating women in engineering, beginning in the late 1800s and running through much of the twentieth century; she focuses particularly on undergraduate education. The book's six chapters break down into two parts: the first half explores outside forces that helped open doors to women who wanted engineering training, specifically World War II and the Cold War; and the second half provides case studies of three universities known for their engineering programs, Georgia Tech, Cal Tech, and MIT. Although the book also explores the situation for women at other universities, such as Purdue, RPI, and Columbia, where many women first got the opportunity to study engineering, Bix's emphasis on these three schools allows her to