Being 'In the True' of Sound Studies

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One of the main methodological problems for people who do interdisciplinary research is that different disciplines speak of the same phenomenon as if it were two or more totally different things. It is not a question of each discipline only being able to claim partial knowledge of an artifact, of relative degrees of truth, or of progress from one mistaken paradigm to a truer one. It is a case of incommensurable assumptions and worldviews simultaneously existing and producing useful knowledge.[1] Many of the central concepts in sound studies carry some degree of this problem with them, since many fields can at once lay claim to knowledge of sound, hearing, listening, or even just vibrations or signals. No single discipline can claim a monopoly of knowledge over what any of these terms means, and certainly sound studies, as an emergent formation in the human sciences, is no exception. We carry dispositions with our own worldviews, belief systems and knowledge as we create and confront our objects of study. As I complete a book manuscript on the history and philosophy of perceptual coding, the technology behind the mp3 format, I am working with two opposed sets of propositions about hearing. One comes from the humanities and one comes from the sciences. And I find myself writing as though both are simultaneously true *and* limited in their truthfulness. In this short reflection on the project, I hope that my personal difficulties will illuminate one of the central problems in contemporary humanistic scholarship on sound – that we are too willing to accept the pieties handed down to us from other humanistic research.[2]

Although I am officially writing a book about the mp3 format, a large chunk of the manuscript is concerned with a field called psychoacoustics. Every mp3 file is constructed according to a set of probabilities based on a psychoacoustically derived, mathematical model of human hearing. Psychoacoustics tracks the relationship between sound technologies and the process of audition. Though the term 'psycho-acoustic' was first applied in 1885 to the part of a dog's brain responsible for sound percep-

1 The alternative would be something like Thomas Kuhn's discussion of gestalt switches and paradigm shifts, where each successive paradigm reveals a new 'truth' about phenomena in the previous paradigm – 'I once took the moon to be (or saw the moon as) a planet but I was mistaken' (Kuhn 1962: 115).

2 C. Wright Mills wrote that conferences ought to consist of scholars discussing the problems they'd encountered in their work, rather than presenting 'finished' papers (Mills 1959, pp. 196-7). The idea was that more real and intellectually useful exchange would occur, rather than the usual striking of poses and hardening of positions. Mills' advice also seems good for 'state of the field' journal issues, and so I have taken it.

tion, its use in studies of humans slowly gained traction in the first half of the twentieth century, with a key moment being the founding of Harvard's Psycho-Acoustic Laboratory in 1940 to conduct Speech, Hearing and Communication research during World War II.[3] Psychoacoustics, along with other fields of study that melded questions of perception and physico-medical research, emerged at the moment when approaches modelled on physiology and other 'hard' sciences came to the fore in academic and industrial psychology. So its disciplinary pedigree is part experimental psychology and a very big part industrial research, combined with bits of acoustics, electrical engineering and auditory physiology. My book argues that the mp3 format is a kind of coming-out party for psychoacoustics, but perhaps my real discovery is that psychoacoustic research has conditioned the sound of almost every sonically-designed technology in the twentieth century, from telephones to speakers to cars to washing machines to mp3s and beyond. But this 'discovery' is a banal statement of fact to anybody who has worked in engineering of computers, communication technologies or recordings (or industrial design) in the past 50 years. In other words, the centrality of psychoacoustics to the history of sound technology is only news if you are in the humanities. Should I be proud or embarrassed?

Michel Foucault famously wrote that 'a proposition must fulfill some onerous and complex conditions before it can be admitted within a discipline; before it can be pronounced true or false it must be, as Monsieur Canguilhem might say, "within the true"' (Foucault 1972: 224; see also Bennett 1993). And this is my problem. While psychoacoustics governs the set of possible questions that can be posed to hearing in a wide swath of industries, sciences and engineering disciplines, critical writing on the field is surprisingly absent from the burgeoning sound studies literature, apart from a few salutary exceptions.[4] This is for good reason: many of the key presuppositions of psychoacoustics run up against the humanist and post-humanist doxas of humanities and social-science sound studies. In order to do their work, psychoacousticians take the human hearing mechanism as essentially universal; they also study the perceptual process independently of meaning, content or indeed consciousness. These choices run up against a set of positions 'in the true' of sound studies: most sound work in the humanities and social sciences assumed the critique of universalism and treats empathy as something that comes after cognition, to use Pierre Bourdieu's formulation (Bourdieu 1984: 3). To that we could add a whole range of pieties deriving from the continued dominance of anti-essentialism as an 'antifoundationalist' foundation for inquiry into human nature, natures, naturecultures, technocultures, or whatever our preferred term might be.

3 *Oxford English Dictionary, s.v.* 'Psycho-acoustic, Psychoacoustics'. Note, however, that the OED's dates are a bit off. They chart the first reference to Harvard's laboratory to 1946, though according to Harvard University's archives the laboratory had been in existence since 1940 (Harvard University Archives, Records of the Psycho-Acoustic Laboratory, UAV 713.9, accessed online at http://oasis.harvard.edu:10080/oasis/deliver/deepLink?_collection=oasis&uniqueId=hua08005 17 January 2006). This, in turn suggests that the term was in common use among researchers interested in auditory perception from sometime in the 1930s.

4 For a discussion of psychoacoustics in acoustic ecology, see Truax (2001); for a critique of the psychoacoustic theory in play at IRCAM, see Born (1995). Two science and technology studies books offer extensive discussions of psychoacoustics: Edwards (1996), and Mindell (2002).

The conflict grows more acute when we move from generalities to particulars. In sound studies, discussions of perception are largely derived from ethnographic, psychoanalytic and phenomenological approaches, which are all about the centrality of meaning to an experiencing, sensing, subject. Psychoacoustic research tends to separate the process of perception and cognition from any construction of meaning, or any particular content. Psychoacousticians would say that the Lacanians and phenomenologists have hearing all wrong, while the humanists and post-humanists would level the same accusation at psychoacousticians. It also gets worse when we get to technology, where humanists' culture of scientific illiteracy takes over. Philosophical critiques of the 'discontinuity' of digital audio are based on a century-old theory of perception advanced by Henri Bergson that has long since been discredited in the sciences, coupled with a gross misreading of Nyquist's sampling theorem – if the authors even know what the sampling theorem is (see Sterne 2006). Meanwhile, if I cite psychoacousticians' discussions of 'how we hear' in the course of a talk, I am likely to get nodding agreement from other humanists, all too willing to concede that the sciences have a monopoly of knowledge on hearing. Obviously, neither dismissal of science and engineering nor their unquestioning acceptance is a plausible intellectual stance.

My way out of this mess in *The Audible Past* was simply to historicise and to use the tools of cultural studies to critique my historical material (Sterne 2003). Certainly, that is a big part of my mp3 project since there is relatively little critical historiography of psychoacoustics.[5] But my book project takes place in the present, and in the midst of the debates about which it writes – it cannot simply take the ironic stance that so much work influenced by Foucault or by science studies might take. We live amongst countless technologies that are psychoacoustics in action; as William James or Deleuze and Guattari might say, it doesn't matter whether psychoacoustics is true because it works (James 1970; Deleuze and Guattari 1987). Because of my topic's proximity to the present, my research for the mp3 book has an oral-historical as well as a textual component. Bell, Berliner and Edison were all happily dead when I met them: they were texts. But when I speak to the engineers who built the mp3, they speak back. One could easily follow the so-called 'Strong Programme' and simply map out the debates and the struggle over truth claims about hearing, but then we have moved to the sociology of scientific (and humanistic) controversies, and have learned little about the history of hearing or sound.[6] That path will not offer new wisdom as to the nature of the sonic worlds in which we and others dwell. A greater challenge would be to hold the paradigms alive and in tension to see what ideas are generated by their interaction. But this is also a risky path,

5 This too will change in time. Mara Mills is a history of science scholar writing a dissertation on psychoacousticians' uses of hard-of-hearing research subjects, and her work does a lot to set psychoacoustic research in its institutional and historical context. See Mills 2007. Janice Denegri-Knott, a macro-marketing researcher, is also working on the connections between mp3, psychoacoustics and information theory.

6 On the Strong Programme's relevance to the study of technology (and its attempt to apply methods for the analysis of scientific controversy to technical controversy), see Pinch and Bijker 1984; Bijker 1995.

since it involves making and defending truth claims, and not simply analysing them from an ironic position.

In the past few years, the field of sound studies – if it is a field – has taken on a greater density. There is on-going interest in sonic topics across the humanities and humanistic social sciences, and the number of conferences and journal issues devoted to sonic topics continues to grow. But we must resist attempts to define the field too much, or to limit it too much. The anxieties of people seeking legitimacy for their field leads them to be too cautious, too closed in around the same canon of theories and examples, and frankly too pious at altars of our various doxas, or the doxas of others, for that matter. The best work in any field begins with researchers being genuinely moved by their questions, perhaps to love and wonder, or perhaps to their opposites. But this is where craft and erudition come in, what Bourdieu calls the epistemological break (Bourdieu *et. al.* 1991). We must not only hold our research subjects and objects at a certain distance, but we must also turn their sensibilities back upon ourselves, so that in the process, our own inquiry is transformed.

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