

Introduction: Audio/Visual

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“A/V” seems to belong to the always-already obsolete. Even at the height of the craze for “audiovisual aids” in the mid-twentieth century, its association with the humble schoolroom and the “A/V geek” gave the acronym an air of the outmoded. Overtaken, in quick succession, by “multimedia” and “new media” at the end of the century, the audiovisual seems all the more rudimentary, remedial rather than remediated, or simply a minor component of larger media systems.

In *New Media, Old Media*, Wendy Chun and Thomas Keenan trace the nominal revolutions and actual interventions achieved by the terms *multimedia* and *new media*:

The term “new media” came into prominence in the mid-1990s, usurping the place of “multimedia” in the fields of business and art. Unlike its predecessor, the term “new media” was not accommodating: it portrayed other media as old or dead; it converged rather than multiplied; it did not efface itself in favor of a happy if redundant plurality.¹

Although the word *multimedia* dates to the 1950s, it was popularized in conjunction with digital technology to describe media forms that combined audio and video with numerical data. Like “new media,” digital multimedia was defined by interactivity. Technological evangelist Nicholas Negroponte claimed to have helped found “multimedia” through his work on the Aspen Movie Map, an (analog) laser disc that offered an interactive “tour” of Aspen, Colorado, in 1979. Celebrating an imminent media revolution in *Being Digital* (1995), Negroponte insisted that multimedia required translation and recombination at the levels of the medium, the message, and the human senses: “Thinking about multimedia needs to include ideas about the fluid movement from one medium to the next, saying the same thing in different ways, calling upon one human sense or another.”² For all this movement and novelty, multimedia aimed at the replication and extension of well-established norms of communication: “The idea is simple: talking, pointing, and looking should work together as part of a multimodal interface that is less about messaging back and forth . . . and more like face-to-face, human-to-human

conversation.”³ Both multimedia and its successor, new media, were terms that announced a unification of sensory modes previously divided through discrete technologies.

The insistence on the novelty of this unification resonates with a common line of thought within media studies. According to the trajectory narrated by Friedrich Kittler, nineteenth-century mechanical recording media separated the senses, and electrical or electronic media subsequently recombined them. Kittler claims that the technologies of phonography, cinema, and typewriting “capable of storing and therefore separating sounds, sights, and writing ushered in a technologizing of information that, in retrospect, paved the way for today’s self-recursive streams of numbers.”⁴ Elsewhere in the history of science and technology, the audio and the visual have also seemed to be irrevocably divided. According to Jonathan Sterne’s (nonhyphenated) audiovisual litany, “assertions about the difference between seeing and hearing” have flourished in the Western intellectual tradition: perspective versus immersion, objectivity versus subjectivity, spatialization versus temporality.⁵ This framework was partially naturalized by Johannes Müller’s 1826 law of specific nerve energies, which indicated that each sensory nerve had a characteristic “quality” or reaction (eventually understood as a function of “brain center” rather than nerve structure). The same stimulus—for instance, a blow to the head—could induce ringing in the ears as well as spots of light. Yet well before television or digital computers, notions of the convergence, connectivity, and analogical relation between the auditory and the visual were widespread in both theory and technological practice. Although Kittler calls the storage media phonography, cinema, and typewriting “the first technological media,” electrical media of transmission such as the telegraph and telephone preceded them, and the seemingly aural field of telephone engineering concerned itself with transmitting text (teletype) and image (facsimile, two-way television) in the first two decades of the twentieth century.

Further, even though the senses were often “separated” as discrete objects of study, perceptual processes remained linked through shared neuroanatomical structure and function, and sensory phenomena—whether carried by the medium of the air or by technical media—were linked through physical analogies. Before the “universal language” of digital code, wave motion was understood to be the common foundation of sound, light, heat, and electricity. Another analogy related electrical telegraphy to the nervous system. As Laura Otis has documented, by “1851 the telegraph and the nervous system appeared to be doing the same things, and for the same reasons. Their common purpose was the transmission of information, and they both conveyed information as alterations in electrical systems.”⁶

These analogies allowed electrical “analog” of sounds and scenes to be constructed; they enabled analog (and later digital) electrical channels (wire and wireless) to “universally” carry a range of sensory data; and at the same time—and well before the twentieth century’s digital conversions—they suggested that *different* media could carry the *same* information (which might nonetheless be perceived in medium- or sensory-specific ways).

The preoccupation with audiovisual interactions which began in the nineteenth century also entailed the synchronization of the different senses, the supplementation of one by the other, and the pursuit of body-machine compatibility through the coordination of the senses and their technical interfaces. In English, *audiovisual* was first applied to teaching aids—visual supplements to (auditory) lectures; later, “radio-visual” materials and other such hybrids appeared. The concept would further expand to include the popular media of television and sound film. Pedagogical methods and technologies were also described as *audito-visual*, a term derived from the brain sciences. Once the brain was determined to have auditory and visual “centers,” some nineteenth-century physiologists theorized that these must be connected by “audito-visual” and “visuo-auditory” commissures—nerve bundles that transferred stimuli from one center to the other—in order to explain such phenomena as writing from dictation and reading aloud. Although audiovisual media eventually came to exclude books, pamphlets, and periodicals, early audito-visual research often focused on the various platforms for language: the conversion and integration of word-knowledge between the visual, auditory, and kinesthetic centers; the combination of audio and visual stimuli to enhance the learning of reading, writing, and speaking.

As suggested by the recent publication of *Audiovisuology*, a compendium of experiments at the interface of sight and sound, A/V and the audiovisual have begun to assert themselves with renewed force as new technical media put pressure on existing theories of perceptual experience.⁷ Rather than conceive the audiovisual as simply another synonym for digital, electronic, or “new” media, this volume follows the longer historical context of the term. If new media and multimedia seem to imply convergence and plurality respectively, a focus on the conjuncture of the audiovisual raises further questions about the relations between vision and audition and their associated technologies. In simple terms, audio might be read as a modifier of the visual, as in the “addition” of sound to motion pictures. Conversely, we might consider the visualization of sounds. Audiovisual might also be interpreted as a form of syncing, an enforced temporal or physical compatibility between media or between media and bodies. Along these lines, *audiovisual* (and especially the shorthand A/V) calls to mind Marshall

McLuhan's "sense ratios." Building upon late-medieval theories of the *sensus communis*, McLuhan argued that the prevailing media types in a given time and place "evoke in us unique ratios of sense perceptions. The extension of any one sense alters the way we think and act—the way we perceive the world. When these ratios change, men change."⁸

We might also read the hyphenated "audio-visual" as a "commissure" of its own, an indication of the exchanges—but not necessarily the *interchangeability*—among the human senses or between technological interfaces. Commissures may also simply be joints. Gilles Deleuze read in Michel Foucault a permanent war between the seeable and the sayable, between an age's "light-being" and its "language-being"—the conjoined and yet distinct components that condition an era's disclosure of entities and that make the history of knowledge and being necessarily an "audio-visual archive."⁹ This distinction-with-connection of the senses continues as the basis for investigations of many kinds: how to coordinate these channels, but also how to introduce a gap between them, a rupture of conventional meaning that becomes the basis for a new meaning.

In some respects, the articles in this special issue of *Grey Room* take what has become a familiar archaeological approach to the question of new-, multi-, and audiovisual media. They operate within a field of objects, as articulated by Jonathan Crary among others, in which "the so-called age of mechanical reproduction" sets the preconditions for the digital present.¹⁰ Yet, where discussion of "mechanical reproduction" has largely focused on technologies of storage (photography, sound recording), the articles here cumulatively insist on the importance of media of transmission and performance. Thus, in addition to the well-worn themes of fixation and automation associated with storage media, the authors variously signal the importance of synchronization, analogy, complementarity, and ergonomic compatibility among the senses and between machines and bodies. Taken together the articles bypass the common assumption of a digital divide around 1950, on the other side of which code, signal, and information dominated all fields. Instead, they tell the long and in many ways continuous history of electrical media to our technological present.

The authors in this volume represent the meeting of distinct research traditions: writing in Germany, Canada, and the United States, they work at the intersection of history of science and media studies. Differences between German and Anglo-American approaches to media have been presented in terms of relative attention to machines and human beings. Chun and Keenan distinguish between "continental European media archaeologists, who have tended to concentrate on the logic and physics of hardware and software, and Anglo-speaking critics, who

have focused on the subjective and cultural effects of media, or on the transformative possibilities of interfaces.”¹¹ The articles in this issue—regardless of the nationality of their authors—do not separate hardware and its subjective effects, but trace their co-constitution (Kursell, Schmidgen, Mills). As W.J.T. Mitchell and Mark B.N. Hansen have recently argued, following McLuhan, “It is the coupling of the human and the technological that holds primacy.”¹² German media theory, John Durham Peters further elaborates, has also been defined by a rigorous incorporation of the history of science and technology through its concentration on *technical media*: “Technical media are distinct from the arts (such as painting, music, or poetry) in their interface with neurophysiology, their capacity for time-axis manipulation, and their engineering standards. . . . A new measure of rigor is introduced into media studies.”¹³ In *A/V*, historians of science turn a similarly precise gaze on questions of aesthetics, tracing the infrastructures of music, audiovisual spectacle, and poetry (Kursell, Tresch, Brain).

Chronologically, the essays lead up to and away from the start of the twentieth century. Beginning in the romantic era, and tapering off in recent settings of technical control and media saturation, they cluster around 1900 and its “second industrial revolution.” This period has traditionally been approached through the narrative of mechanization, which is seen as “taking command” of production, knowledge, and everyday life, bringing about monotony, homogeneity, and standardization. The sciences’ contributions to the standardizing of individuals and masses have been identified in studies of statistics through the appearance of norms and deviance. Normalization and mechanization have been seen at work in early experimental psychology and psychophysics, sites of shared fascination for historians of science and of media. The equipment of the psychophysical laboratories of Wilhelm Wundt and others analyzed reaction times, difference thresholds in perception of colors and sounds, and sense ratios; they also, as Brain’s essay shows, broke down language into its constituent parts. Where industrial studies of fatigue and efficiency presented the human body as a productive motor, psychophysics reduced the mind to a series of interacting processes—processes both mirrored and conditioned by the equipment that measured and analyzed them.¹⁴ The entwinement of the psychophysics laboratory with the concerns of electrical engineering suggests how sense technologies were only partly dependent on sites of reception—on scrolling graphs, speakers, or screens: the measurable productivity of the body and mind were also built into large technical networks. Further, both physiology and psychophysics relied on a conception of the body and mind as possessing a finite quantity of energy that, though it could be converted into different forms, was constantly threatened

with dissipation.¹⁵

The essays here dip into but are not submerged by these well-established stories of mechanization. They have a tendency to disrupt well-known narratives, almost inadvertently, simply by virtue of focusing on the audiovisual. One significant casualty is the notion of a single mode or historical trajectory of mechanization. We see the sites of innovation as multiple, stemming as much from the shop floor, bohemian cliques, or the lessons of the piano teacher whose fingerprints became the model for a new ideal of beautiful performance, as from scientific laboratories, R&D, or management offices. What exactly counts as “mechanization” also becomes a question: the introduction of machinery into established processes does not simply lead to standardization but, in the case of Marie Jaëll’s finger traces, manages to shift the basis of individuality (Kursell). In the case of André-Marie Ampère’s new science of “technaesthetics,” a notion indebted to protophenomenologist Maine de Biran’s analysis of imperceptible internal movements and judgments, mechanical repetition became the precondition for irreducibly subjective experience (Tresch). In several of the papers we see notions of mechanization that go beyond the idea, fixed by Daston and Galison’s argument concerning “mechanical objectivity,” that machines were introduced into processes of knowledge in the service of an inhuman detachment from the objects of knowledge.¹⁶ Rather than detachment, many of these sensory technologies were presented as means of a closer integration between subjects and nature or between subjects and media: pedagogical techniques amplified and projected life itself as visual intuition for students (Schmidgen); audiometric techniques increased the suture between the average ear and the telephone (Mills); and physiological aesthetics aimed at oral performance and social revolution (Brain). Another frequent assumption is that mechanization attains or at least targets increased efficiency. Such an aim is surely present in industrial endeavors such as the mass-scale expansion of the telephone discussed by Mills and the spectatorium discussed by Schmidgen, but just as often we see the analysis and reconstruction of physical processes attuned primarily to historically specific aesthetic modes.

Beyond that of a relentless and monotonous progress of mechanization, another familiar narrative to describe this period has been the emergence and consolidation of the modern disciplines, with divisions established between expert and popular knowledge, between distinct academic fields (each with its central methods, founding figures, teaching lineages, and journals), as well as the alleged split of the “two cultures,” corresponding to what Bruno Latour has described as the “modern constitution” that presented the domain of subjects and

subjectivity as lying at an uncrossable distance from objects and objectivity.¹⁷ These papers dig beneath the ideology of two cultures, showing the avant-gardes of the sciences and the arts in constant and often unpredictable communication, producing (and frequently celebrating) the “hybrids” Latour sees as the unannounced obsession of modernity. They also minimize the alleged high-low gap between the sciences and popular culture by turning to techniques of pedagogy and popularization, moments when refined techniques passed from exclusive domains and institutions to broader publics. They trace the anarchistic ends to which phonetics could be put; the changes in the scientific definition of normal hearing generated, at least in part, by hard of hearing activists; the cross-fertilization of grand opera and scientific “vulgarization”; and the changes to the high art concept of the image implied by the cell phone screen.

The essays gathered here also bypass teleological accounts that depict innovations of the past as either moving toward or falling to the side of “achieved” technologies such as the cinema or the computer.¹⁸ Without falling under the spell of abandoned technologies by virtue of their obsolescence alone (as is at times the case in salvage projects like Siegfried Zielinski’s *Variantology*), they attempt to grasp each innovation in the terms of its era, without the bias of what would later happen—most strikingly, perhaps, in Schmidgen’s “deconstruction of the history of cinema.”¹⁹ Nevertheless, in no way do the authors deny accumulation or the path dependence through which certain techniques become entrenched and through which one generation’s innovations become the a priori of the next: without a science of electrical signals, there would be no shift toward a paradigm of information, and subsequently no cell phone; the piano begets the player piano, which in turn begets a new notion of individuality. Taken as a whole, the papers tell a story neither of relentless, increasing efficiency nor of a radical break from one era to the next. While acknowledging the decisive increase in this period in the number of sites in which automated and electric technologies came to intervene among the senses and between the senses and the world, the overall narrative implied by this collection is neither univocal nor monolithic. This is due in part to the fact that we focus not primarily on media of storage—with their implication of enclosure and fixity—but on transmission and performance. These essays’ multisited and multisensory conjunctures enact a dappled, polyphonic narrative, one of technification without totalization.

Once we concentrate on the relation between sound and vision, the other senses—most particularly touch—also demand our attention. This collection is thus a contribution to the history of the senses and their coevolution with technological media. Its essays offer a series of explorations of the milieu—what Jakob

von Uexküll called the *Umwelt*—that envelops and is made perspicuous by the human senses and their appendages.²⁰ The essays observe the modifications brought to the ambit of the senses by specific technologies—expanding or reducing the world to which we have access and to which we make folds, sutures, and braids through ongoing experiment. What emerges is a map of exemplary but never definitive ecologies, composed across and between disciplines and their variable epistemologies: tracings of the strata that form the technical sensorium of modernity.

Notes

1. Wendy Hui Kyong Chun and Thomas Keenan, "Introduction: Did Somebody Say New Media?" in *New Media, Old Media: A History and Theory Reader* (New York: Routledge, 2006), 1.
2. Nicholas Negroponte, *Being Digital* (New York: Alfred A. Knopf, 1995), 72.
3. Negroponte, 99.
4. Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999), xl.
5. Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction* (Durham, NC: Duke University Press, 2003), 14.
6. Laura Otis, *Networking: Communicating with Bodies and Machines in the Nineteenth Century* (Ann Arbor: The University of Michigan Press, 2004), 11.
7. Dieter Daniels and Sarah Naumann, eds., *Audiovisuology 1 (See This Sound)* (Cologne: Walther König, 2010). For an earlier return to audiovisual theory in the context of sound film, see Michel Chion, *Audio-Vision: Sound on Screen*, trans. Claudia Gorbman (New York: Columbia University Press, 1994). See also David Rodowick, "Audiovisual Culture and Interdisciplinary Knowledge," *New Literary History* 26, 1 (Winter 1995): 111–121.
8. Marshall McLuhan and Quentin Fiore, *The Medium Is the Massage: An Inventory of Effects* (Berkeley: Gingko Press, 2001), 41.
9. Gilles Deleuze, *Foucault*, trans. Seán Hand (Minneapolis: University of Minnesota Press, 1988), 43.
10. Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the 19th Century* (Cambridge: MIT Press, 1990), 2.
11. Chun and Keenan, "Introduction," 4.
12. W.J.T. Mitchell and Mark B.N. Hansen, introduction to *Critical Terms for Media Studies* (Chicago: University of Chicago Press, 2010), xii.
13. John Durham Peters, "Strange Sympathies: Horizons of Media Theory in America and Germany," *Electronic Book Review*, 4 June 2009, <http://www.electronicbookreview.com/thread/criticalecologies/myopic>.
14. Simon Schaffer, *From Physics to Anthropology—and Back Again* (Cambridge, UK: Prickly Pear, 1994).
15. Crosbie Smith and M. Norton Wise, *Energy and Empire: A Biographical Study of Lord Kelvin* (New York: Cambridge University Press, 1989); and Anson Rabinbach, *The Human Motor: Energy, Fatigue, and the Origins of Modernity* (Berkeley and Los Angeles: University of California Press, 1992).
16. Lorraine Daston and Peter Gallison, *Objectivity* (New York: Zone Books, 2007).
17. Bruno Latour, *We Have Never Been Modern* (Cambridge: Harvard University Press, 1993).
18. As urged by David Edgerton in *The Shock of the Old: Technology and Global History since 1900* (New York: Oxford University Press, 2006).
19. Siegfried Zielinski and Silvia M. Wagnermaier, eds., *Variantology 1: On Deep Time Relations of Arts, Sciences and Technologies* (Cologne: Walther König, 2005).
20. Jakob von Uexküll, *Mondes animaux et monde humain* (Paris: Gonthier, 1965).