



The pulse of modernism: experimental physiology and aesthetic avant-gardes circa 1900

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ABSTRACT

When discussing the changing sense of reality around 1900 in the cultural arts the lexicon of early modernism reigns supreme. This essay contends that a critical condition for the possibility of many of the turn of the century modernist movements in the arts can be found in exchange of instruments, concepts, and media of representation between the sciences and the arts. One route of interaction came through physiological aesthetics, the attempt to 'elucidate physiologically the nature of our Aesthetic feelings' and explain how works of art achieve their effects. Physiological aesthetics provided the terms for new formalist languages of art and criticism, and in some instances suggested optimistic, even utopian, possibilities for art to remake human individuals and societies.

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We may not be able to consciously comprehend an emotion that an artist tries to express but we can be made to feel it; artists set down those outward manifestations of their emotion that our body will mechanically imitate, however lightly, so as to place us in the indefinable psychological state that caused them. (Bergson, 1888, p. 13)

1. Introduction

My subject is modernism in the sciences and in the arts. The lexicon of modernism reigns supreme, of course, when historians of culture and the arts speak of the changing and contested sense of reality around 1900. Historians of science have been less inclined to take up the modernist vocabulary, with some notable

exceptions.¹ This contribution makes another case for doing so. Clement Greenberg's famous remark that 'by now it [modernism] includes almost the whole of what is truly alive in our culture' held true from its beginnings around 1900.² Modernism's proverbial breaks with traditions and the past, its obsessions with purity, disciplinary foundations, and formal language systems challenged not only the conventional sense of reality but more importantly the terms in which any sense of reality could be communicated.³ Similar debates raged in the sciences around 1900, often for reasons that might be described as internal to the scientific questions involved.⁴

But very often scientific and artistic modernisms arose in contexts of exchange between physicists and composers, physiologists and painters, psychiatrists and poets. One such economy of exchange developed between physiology laboratories and avant-garde artists.⁵ The role of science, and especially physiology,

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¹ Notable contributions from a growing list would include Galison (1990); Mehrtens (1990); Micale (2004); Richardson (2002).

² Greenberg (2003 [1960]), p. 774.

³ On modernism's challenges to the sense of reality, see Butler (1984); Everdell (1994); Kern (1983); Matsuda (1996).

⁴ Staley (2005).

⁵ On relations of physiology and the arts, see Crary (1990, 1999); Kahn (1999); Schmidgen et al. (2004). I use 'physiology' as it was understood in its imperial moment ca. 1900 to include ancillary disciplines such as experimental psychology, psycho-physics, experimental phonetics, and a range of applied disciplines. For approaches to nineteenth and early twentieth-century physiology, see Coleman & Holmes (1988); Geison (1987); Sarasin & Tanner (1998). For innovative approaches to the subject, see the Virtual Physiology Laboratory website sponsored by the Max Planck Institute for the History of Science, Berlin: <http://www.vlp.mpiwg-berlin.mpg.de> (accessed 28 January 2008).

in early modernism has often been recognized. Yet rarely has this observation not been hastily qualified or marginalized within a *cordon sanitaire* designed to preserve one of modernism's founding myths. That myth states that modernism is either a deterministic effect of modernity or a reaction to or negation of it. Both versions posit the relation of modernism to modernity, or aesthetics to technology, as one of *externality*. There have been many articulations of this position, of course, but perhaps none more decisive than Clement Greenberg's, which bears quoting at length.

One begins to realize that the Neo-Impressionists were not altogether misguided when they flirted with science. Kantian self-criticism finds its perfect expression in science rather than in philosophy, and when this kind of self-criticism was applied in art the latter was brought closer in spirit to scientific method than ever before—closer than in the early Renaissance. That visual art should confine itself exclusively to what is given in visual experience, and make no reference to anything given in other orders of experience, is a notion whose justification lies, notionally, in scientific consistency. Scientific method alone asks that a situation be resolved in exactly the same kind of terms as that in which it is presented—a problem in physiology is solved in exactly the same kind of terms as that in which it is presented—a problem in physiology is solved in terms of physiology, not in those of psychology; to be solved in terms of psychology, it has to be presented in, or translated into, these terms first. Analogously, Modernist painting asks that a literary theme be translated into strictly optical, two-dimensional terms before becoming the subject of pictorial art—which means its being translated in such a way that it entirely loses its literary character ... From the point of view of art itself its convergence of spirit with science happens to be a mere accident, and neither art nor science gives or assures the other of anything more than it ever did. What their convergence does show, however, is the degree to which Modernist art belongs to the same historical and cultural tendency as modern science.⁶

In Greenberg's eloquent formulation disciplines root themselves in their own media and their specific problems and competences.⁷ Within its terms one can therefore only identify a Modernist *Zeitgeist* of self-critical reflection, or something like Carl Schorske's political ether of decaying liberalism, to explain the extraordinary homologies between disciplinary practices in fin-de-siècle Europe.⁸ Yet we now have numerous accounts showing that many of these parallels were not mere accident but the vibrant effect of real exchange of instruments and ideas.⁹

To identify an exchange of tools and concepts between disciplines might be enough to destroy Greenberg's partition. But I wish to argue further that the case for the immanent character of technoscience in artistic modernism rests on more than the interdisciplinary transfer of tools and concepts. The physiologists and artists I am concerned with participated in a combined effort, sometimes quite deliberate, to remake the human body, especially the human sensorium, in decisive ways.

Several historians have recently demonstrated how severely disrupted were the traditional order of the senses in the nineteenth century, and how acutely contemporaries felt the stakes of the sensory disarray.¹⁰ These were the conditions that prompted the ever alert young Karl Marx to observe in 1844 that 'the forming of the five senses is a labor of humanized nature. The forming of the five senses is a labor of the entire history of the world down to the present'.¹¹ Many nineteenth-century scientists took that labor upon themselves. Indeed, much of the project of nineteenth-century physiology might be understood as an attempt to address the perceived sensory disorder, or to transform the sensory capacities of human beings.¹² From the early investigations of Johannes Mueller, Jan Purkyne, and Kaspar Tourtual to the mid-century studies of Helmholtz and Brücke the prevailing strategy among physiologists, demonstrated most famously by Mueller and Helmholtz, was to compare senses to scientific instruments: the eyes to lenses, the ear to resonators, and so on.¹³ But certain kinds of instruments, especially self-recording apparatus, which unlike optical devices like microscopes and telescopes did not simply amplify sense perception but rendered it as indexical tracings, were frequently described as extensions of human sentience, and by 1900 increasingly as 'new senses' or freestanding, autonomous gates of perception. Initially viewed as technical prostheses, recording instruments encouraged a new view among physiologists, a 'remediation' of the human senses as technical instruments themselves.¹⁴ This essay examines the new sensory regime brought into being by graphical recording instruments.

The physiologists' new senses typically came to fin-de-siècle art worlds indirectly, mediated by a critical third term: aesthetics. Modern theories of the aesthetic began, as Terry Eagleton reminds us, as a 'discourse of the body'.¹⁵ As primarily conceived by the eighteenth-century philosopher Alexander Baumgarten, aesthetics concerned itself primarily with the sensory infrastructure of the human body, and only secondarily with the essence of art.¹⁶ The rise of scientific physiology in the nineteenth century triggered a resurgence of aesthetic theories steeped in the instruments and lexicon of the laboratory to account for the sensory and bodily

⁶ Greenberg (2003 [1960]), pp. 777–778.

⁷ On Greenberg see Jones (2006).

⁸ The classic argument is from Schorske (1981).

⁹ Henderson (1998); Henderson (1983); Lenoir (1997); Micale (2004); Silverman (2004); Werner (2002).

¹⁰ Corbin (1990); Dias (2004); Schivelbusch (1987 [1977]); Sterne (2003), and Thompson (2002).

¹¹ Marx (1988), pp. 108–109.

¹² For a fine account of these themes in early nineteenth-century Britain, see Green Musselman (2006).

¹³ See, for example: Mueller (1826); Purkyne (1939); Tourtual (1827); Helmholtz (1863); Brücke (1871, 1887). On these figures see Lenoir (1994); Hagner & Wahrig-Schmidt (1992); Turner (1994), pp. 57–58.

¹⁴ The term remediation comes from Bolter & Grusin (1999). It codifies Marshall McLuhan's famous dictum which opens his *Understanding media* (McLuhan 1964) that 'the content of a medium is always another medium. The content of writing is speech, just as the written word is the content of print, and print is the content of the telegraph'. Bolter and Grusin describe remediation as a term that captures the constant 'oscillation' between 'transparent immediacy' and 'hypermediacy', which they deem a common feature of historical moments of change in technical media.

¹⁵ Eagleton (1990), pp. 13–17. Eagleton's burden is to deliver aesthetics from the charge that it is merely idealist and bourgeois by returning it to its bodily and materialist orientation. See also Gilmore (2004).

¹⁶ The early aestheticians conceived the discipline in close adherence to the etymology and traditions of aesthetics. The term 'aesthetics' derives from a quilt of Greek words which designate activities of sensory perception in a strictly physiological sense, as in 'sensation', as well as a mental sense, as in 'apprehension'. *Aisthētikos* derives from *aisthēta*, things perceptible by the senses, from *aesthesthai*, to perceive. For a complete etymology, see Liddell & Scott (1996).

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