DIGITISATION AND MATERIALITY FORUM

Digital Culture, Materiality and Nineteenth-Century Studies

James Mussell

The rhetoric of the virtual stubbornly clings to digital culture, even though our experience of working within it is of a resisting medium that only behaves in certain ways. The persistence of the virtual demands attention: why do we cling to such a description even while we quite willingly recognise the interpenetration of the world beyond the monitor and that represented on it? In education we're encouraged to use Virtual Learning Environments, as if somehow these spaces are not as real as classrooms; we participate (or read about others participating) in virtual worlds such as Second Life or World of Warcraft, places that imitate the real world, providing access to fantasies that are underpinned by very real economics; and we exploit the World Wide Web, believing in its textual metaphors (pages, hypertext) while ignoring its presence as a medium. In my contribution to this forum I want to suggest that our insistence on the immateriality of digital culture enforces an ontological distinction that overdetermines the materiality of the world beyond the monitor while misrecognizing the new things that are displayed upon it. Rather than continue to use the virtual as a category, I would like to argue using an alternative term, the apparition.[1] Unlike the virtual, which foregrounds its effect of the real with reality itself present only as absence, apparition has two meanings: the first is an immaterial appearance, a ghostly presence that, like the virtual, can signal an absent materiality; the second is simply the appearance of something, specifically the emergence of something into history. It is this latter meaning, I suggest, that permits materiality to re-enter digital discourse.

The emergence of the virtual as a category has been linked to the development of the information economy and, in particular, the electronic communication networks that sustain it today.[2] However, concerns over the virtuality of information are not uniquely postmodern. In 1890, in one of his regular surveys of science education published in *Chemical News*, William Crookes bemoaned the lack of practical scientific training provided in schools. Without science, he argued, 'in a word the study of *things* in contradistinction to *words* and

abstractions', it is impossible to acquire the 'art of observation'.[3] For Crookes, this faculty was vital as it taught students to appreciate the materiality of things:

> The question how we are to learn is not less important than its companion what we are to learn. The youth who studies chemistry from books, however closely and laboriously, will reap little or no advantage from his labours. If he has done nothing further than read he will still be in the bonds of verbalism, unable to learn from and to interpret phenomena.[4]

Although Crookes was participating in wider debates over the status of science as an intellectual attainment and the relationship between scientific education and the state of the nation's industries, his comments also suggest a certain unease with the privileging of knowledge generated from representations rather than phenomena. As a chemist, Crookes's work constantly confronted him with objects of an uncertain or liminal materiality. At the time of this article, for instance, his spectroscopic research into the rare earths involved breaking down supposed elements into yet more subtle constituents, and his work on radiant matter — made possible by his innovations in the production of spaces devoid of things, vacuums — established the cathode ray as a potential fourth state of matter.[5] Crookes, of course, was also a spiritualist but even his encounters with spirits were predicated on materiality. Ghosts were not just virtual beings, signifying an absent body, but rapped tables, materialized in cabinets and, in the case of Katie King, had pulses one could measure.[6] In all these aspects of his life, Crookes was working on phenomena that were either difficult to see (spirits in darkened rooms, products of chemical experiments) or subvisible (cathode rays, chemical elements). At stake was not just making them visible, but recording their traces so that others could see them too.

Crookes, therefore, grappled with apparitions in all senses of the word. For him, materiality was not a given but something that must be worked upon to be made substantial. Yet it is precisely such an awareness that is lost in accounts that gloss over the specificities of the nineteenth century in order to posit it as an industrial period that has been surpassed in the creation of the post-industrial present. This teleological narrative, closely intertwined with the workings of global capitalism, posits an information age as a way to displace while exerting mastery over a simpler, less sophisticated past that is simultaneously realized in the present

as the 'developing world'. Yet the history that sustains this narrative is suspect: when we view the industrial age through posthuman eyes we do not see a period structured by economies based upon the ownership and transfer of things; rather, we see a world that contained things, was haunted by absent things, and struggled to establish what are things and what are not. Nineteenth-century studies offers a great deal to histories of materiality, and a more nuanced understanding of materiality will allow us to better understand not only nineteenth-century attitudes to the things in its world, but also the cultural work required to bring them into being.

It is vital that we recognise both the different material forms that things can take and the role that people, texts and artefacts play in cohering them. Unfortunately, this rich material history is also often lost in nineteenth-century studies today. Our preference for reading about things rather than thinking about the things themselves ensures that we encounter the period's objects largely as representations. Equally, our methodologies reveal a textual bias that prevents us thinking about materiality seriously. Although psychoanalysis, poststructuralism and postmodernism have all demonstrated that materiality does not necessarily structure the real, they do so by recourse to the sign. As signification is predicated on a double negation — signifiers refer only to other signifiers, and there is no essential link between signifier and signified — it prevents the easy reduction of the real to an objective, observable, material realm; however, in opening space for culture, signification simultaneously reduces things to surfaces upon which signs can play. For instance, to celebrate the *jouissance* of textuality, Barthes must suppress the material, enforcing a demarcation between work and text that he recognises is untenable.[7] Such approaches betray the linguistic bias that underpins them and so, even when applied to material culture, cannot account for the material properties of things.

Yet the nineteenth century is a crucial period in both the history of things, and the history of how those things entered the world. It was the century that saw the institutionalization of scientific disciplines, sites in which new things were discovered and then allocated a place in nature. It saw the proliferation of museums and collections that brought things together, often drawing upon new spaces of

imperial expansion. It was the century that developed various strands of intellectual property law that could establish not only the ownership of things, but also their identity over different forms. We, like Crookes's schoolboys, risk developing the 'vice of inobservance' as a result of 'the exclusively literary character of our present system of education'.[8] If we apply theories and gather information exclusively from textual sources we develop knowledges that hamper our capacity to understand not just the materiality of the nineteenth century, but also those new objects that are emerging in digital culture.

It is perhaps unsurprising that a dematerialized critical theory lends itself so well to studies of digital culture.[9] Just as the web seems to liberate information (the hackers' slogan: 'information wants to be free') from its material carriers, so critical theory insists that meaning is produced by signs that are more or less independent of the things that carry them. A similar discourse operates within information theory. In *How We Became Posthuman* (1999), N. Katherine Hayles traces the origin of the virtual to the emergence of cybernetics in the aftermath of the Second World War.[10] She identifies the Macy Conferences (1943-1954) as a formative moment through which a concept of information emerged that was independent of materiality. Information theorists conceptualized information as probability logarithms, sets of mathematical principles that could be used to model informational flow regardless of specific material context. Claude Shannon's description of information as a message, encoded in a signal and then decoded at its destination, posits communication as a closed system based upon stasis.[11] A successful message in this system is one that is not altered by noise from the systems through which it moves. Although such models are conceptually distinct from poststructuralist notions of communication, which locate meaning not in the origin of a message but in the destination, Hayles suggests that poststructuralism began to re-examine the relationship between presence and absence in signifying systems at the moment when it was being displaced by one predicated upon pattern and randomness.[12] 'Presence and absence', she writes, 'were forced into visibility, so to speak, because they were already losing their constitutive power to form the ground for discourse'.[13] For Hayles, Lacan's floating signifier, which posits an absent

materiality, is displaced by the flickering signifier that, with its roots in information theory, attempts to displace the material altogether.

Hayles's argument is that we must recognise the constitutive role that materiality (even experienced as noise) plays in information systems in order to reconceptualize the posthuman so that it is not reducible to cybernetics.[14] While I am sympathetic to her arguments, I think that there is a different way in which materiality seems to haunt information. When Hayles describes flickering signifiers, she does so as a chain of codes, in which signifiers on one level operate as signifieds on another. The relations between levels remain arbitrary, but can be stipulated by altering higher-level codes. Bruno Latour, in considering the way in which scientists inscribe laboratory events (and so the unknown things that produce them) into persuasive documents, suggests something similar.[15] For Latour, science studies 'has always been an analysis of how language slowly becomes capable of transporting things themselves *without* deformation *through* transformation'.[16] Rather than understand science as an attempt to isolate and define the material world, and scientific writing as a means of representing it textually, Latour sees scientific practice — whether this is doing experiments, analyzing results, or writing papers — as a process that deliberately confuses epistemological and ontological questions, blurring the boundaries between things and the words that describe them.[17] If, in scientific debate, the side that triumphs is 'the one who can muster the most well-aligned and faithful allies', then this privileges a certain type of writing and imaging which makes '*this agnostic situation more favourable*'.[18] This evidence consists of 'objects which have the properties of being *mobile* but also *immutable*, *presentable*, *readable* and *combinable* with one another'.[19] These objects, which Latour calls inscriptions, are the final stage in a process which refers back to the phenomena that they describe. However, inscriptions do not refer to things in an exterior world beyond them, but instead present them within themselves: by recording the material traces of phenomena under carefully delineated conditions, it is possible to gesture to its presence as inscription rather than maintain it in a distinct external ontological realm. Scientists, Latour claims, 'start seeing something once they stop looking at nature and look exclusively and obsessively at prints and flat inscriptions'.[20] If

scientists — or readers, viewers, users, or members of an audience — accept the stability of the links of the chain, then they also accept the presence of the phenomena, despite the evident transformations and translations it has undergone to reach them.

Latour describes reference in semiotic terms, in which each link in a chain operates as sign for the one that precedes it and a thing for the one that follows.[21] Hayles's flickering signifiers similarly consist of chains of signification, in which some layers operate as discrete processes that can be manipulated by other codes in the system. Although it seems that computer programs lack the presence of a phenomena, this is only problematic if we conceive the origins of materiality in a discrete natural realm that is manipulated by humans and then has signification imposed upon it. As Hayles argues, the metaphysics of presence that underpins both liberal humanist ideology and its poststructural critique requires materiality to act as the placeholder of the real: in liberal humanist terms, the self is articulated against an external, knowable world; in poststructural terms, this external world is lost in chains of signification. A system predicated on pattern and randomness, however, has no need of origins and has no definite ends. Meanings are not pre-supposed as being in the world; rather the world, as environment, establishes the patterns through which we make sense of it. Once the boundaries between the natural world as the source of materiality and the human culture that manipulate it are troubled, we can begin to recognise the many ways in which things can be material. After all, given the correct resources a computer program is as repeatable as a scientific experiment; we simply deny its material existence by considering it wholly the result of human ingenuity and so independent of natural, material resources. As Latour argues, our tendency to 'black-box' science and technology and render them unobtrusive aspects of our social lives masks the complex systems that constitute them.[22] In a way, malfunctions — whether of bodies or machines — always remind us of the contingency of materiality: what we think of as well-bounded objects are revealed to consist of a host of components, all interacting differently with the world around them.[23]

Just as Crookes insists that the abstractions of verbalism must be tempered with studies of the things themselves so, I suggest, must the rhetoric of the virtual be tempered by practical experience of designing and building digital resources.[24] The nineteenth century is also important here, as (at least in the UK) its printed material remains are largely out of copyright. It is very difficult, in producing a digital edition, not to be aware of the materiality of both source materials and final resource. The stages that are involved — scanning, analysis, encoding, markup, storage, processing — do not efface the materiality of the source object, but instead reproduce aspects of it in the resource that results. For instance, in producing the *Nineteenth-Century Serials Edition* (Hhttp://www.ncse.kcl.ac.uk/) we had to establish not only what were the source objects (bound volumes or single issues? Supplements? Editions? Sections? Articles? Headlines? Sentences? Words? Images?) and work out their relationships with one another, but also to address the changes in form introduced when transforming disparate runs of hard copy into reels of microfilm and then into digital images and transcripts. This is a type of editing that consistently reminds the editor of the materiality of the objects being manipulated: digital images have properties just like images printed on paper; periodicals in digital form have to be stored (just not on shelves) and XML has structures just like other publications. A good resource will function within Latour's model of reference: not so much as a digital surrogate for an absent object, but instead as a new object that reproduces the things to which it refers.

The term apparition avoids the discourse of the virtual outlined by Hayles in *How We Became Posthuman*. Although in its more common sense, apparition simply means becoming visible, it does not signify lack in the same way as the virtual. The word apparition also describes the coming into being of things, the emergence of new entities into history. It is this latter aspect that is important as it ensures that we can recognise the ways in which digital culture is changing our world. With the proliferation of web 2.0 applications, digital objects are increasingly liberated from the resources in which they were created.[25] Although their properties are defined by code in advance, the potential for them to exist in new contexts makes them unpredictable, providing them stages upon which they can perform.

Like scientific phenomena in the laboratory, such conditions grant digital objects the autonomy to demonstrate unexpected properties. As studies of nineteenth-century objects and of the nineteenth-century people who worked with them remind us, we have always experienced a world in which materiality has to be established. It would be naïve to use the apparitions within digital culture to enforce an ontological divide between the digital and the world beyond it that misrecognises both the materiality of the objects each contains and the work that must be performed to create them.

Endnotes:

[1] See Vilém Flusser, 'Digital Apparition', in *Electronic Culture*, ed. by Timothy Druckrey (New York: Aperture, 1996), pp. 242–6.

[2] See, for instance, the opening of Jean Francois Lyotard's *The Postmodern Condition*, trans. by Geoff Bennington and Brian Massumi (Manchester: University of Manchester Press, 1984), pp. 3–6.

[3] [William Crookes], 'Address to Students', *Chemical News*, 62 (19 September 1890), 139.

[4] [William Crookes], 'Address to Students', 139.

[5] William Crookes, 'On Radiant Matter', *Nature*, 20 (28 August and 4 September 1879), 419–23 and 436–40. See also Robert K. DeKosky, 'William Crookes and the Fourth State of Matter', *Isis* (1976), 36–60.

[6] Katie King was a spirit materialized into a separate form by the medium Florence Cook. For Crookes as scientist and spiritualist see Roger Luckhurst, *The Invention of Telepathy, 1870–1901* (Oxford: Oxford University Press, 2002), pp. 24–36. For further details about Crookes and Florence Cook see Trevor H. Hall, *The Spiritualists: The Story of Florence Cook and William Crookes* (London: Gerald Duckworth, 1962).

[7] See Roland Barthes, 'Death of the Author', in *Image, Music, Text*, ed. and trans. by Stephen Heath (London: Fontana, 1977), pp. 142–8. See also, 'From Work to Text', in *Image, Music, Text*, pp. 155–64.

[8] [William Crookes], 'Address to Students', 139.

[9] For a discussion of this see George P. Landow, *Hypertext 3.0* (Baltimore: Johns Hopkins University Press, 2006).

[10] Katherine N. Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Information* (Chicago: University of Chicago Press, 1999), p. 14.

[11] See C. E. Shannon, 'A Mathematical Theory of Communication', *Bell System Technical Journal*, 27 (1948), 379–423, 623–6.

[12] Although, strictly speaking meaning is irrelevant for information theory: rather, it is predicated on the amount of distortion to a signal. See Hayles, *How We Became Posthuman*, p. 32.

[13] N. Katherine Hayles, 'Virtual Bodies and Flickering Signifiers', in *Electronic Culture*, p. 261.

[14] Hayles, *How We Became Posthuman*, pp. 283–291.

[15] See Bruno Latour, *Science in Action* (Cambridge, MA: Harvard University Press, 1985).

[16] Bruno Latour, *Pandora's Hope: Essays on the Reality of Science Studies* (Cambridge, MA: Harvard University Press, 1999), p. 93.

[17] Latour, *Pandora's Hope*, p. 96.

[18] Bruno Latour, 'Drawing Things Together', in *Representation in Scientific Practice*, ed. by Michael Lynch and Steve Woolgar (Cambridge, MA: MIT Press, 1990), p. 23. Emphasis is Latour's.

[19] Latour, 'Drawing Things Together', p. 26.

[20] Latour, 'Drawing Things Together', p. 39.

[21] Latour, *Pandora's Hope*, p. 56.

[22] 'Black-boxing' is a term from cybernetics that reduces complex operations into a simple input and output. See Latour, *Science in Action*.

[23] For instance, consider the questions that confront us when computers stop working: is the problem hardware or software? Which application? Which component? What did you last do? Have you tried switching it off and on again? These questions pass between object and information, the material and virtual; and, in encompassing inputs and outputs, demonstrate that objects are not autonomous from the world around them.

[24] And here I agree with Jerome McGann. See *Radiant Textuality: Literature After the World Wide Web* (New York: Palgrave, 2001), pp. 18–19. See also Jerome McGann, 'The Way We Live Now: What is to be Done?' <http://www.nines.org/about/bibliog/mcgann-chicago.pdf >[accessed 11 March 2008].

[25] For a demonstration of this, see the way that NINES uses rdf to allow objects from a range of resources to be collected and annotated with its COLLEX application.<www.nines.org> [accessed 1 February 2008].