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A MATERIAL DESCENT INTO DIGITAL MEDIA

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When discussing contemporary media forms, often referred to as digital media, it is often the case we come unstuck and self-consciously aware of the fuzzy inaccuracies of the terms and dichotomies we implement. Previous media types have been framed as 'old', 'physical', 'analogue', clunky and solid. The language employed for contemporary media often highlights an opposing ethereality and cleanliness with terms like 'new', 'digital', 'informational', and 'cloud' developing a clear division from those media forms that came before. These inaccuracies in language inform our understanding of the nature of these technologies and how they shape and are shaped by society. Our focus on the social layer of digital media, its effects and uses, has encouraged definitions that focus too much on its implications. As a result, our framing overlooks fundamental material realities that underpin those same implications. With digital media swiftly supplanting other media forms, it is imperative that we 'descend', historically and materially, into digital media in order to better understand it.

This paper historically and materially situates the Hard Disk drive as one material foundation for contemporary digital media. By 'descending' into the Hard Disk Drive the paper demonstrates how its operation plays a role in the affordances of digital media and how these affordances are prefigured in older media technologies. The paper hopes to demonstrate that, given the right conceptual frameworks, we can learn from a radically material approach to media technologies whilst retaining recognition of the social.

Hutchby's (2001) 'affordances' provides us with a route by which the physicality of media artefacts can be accounted for, whilst reconciling constructivism with the realities of material things. In contrast to Medium theory or STS that tend to stress media effects or materiality's dependence on the social, the concept of affordances offers a more nuanced approach that better suits the aims of this study. In short, affordances refer to the spectrum of possible ways in which an artefact may be utilised, made possible by its material realities. Unlike 'capacities', affordances do not determine an artefact's use but frame the possibilities of action a user may take. Use and consequence of an artefact is not pre-determined, but the realities of its construction will support and constrain those possibilities. No matter how hard one tries, a slot machine cannot be used as a telephone. Equally, the material foundations of our digital media also constrain and support our possibilities of action.

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This paper is inspired by work in the emerging field of Media Archaeology, particularly its utilisation of Foucault's (2002) genealogical method. This approach, which seeks to understand why the present *is as it is*, highlights 'descent' as a key conceptual tool to study media. In this context 'descent' refers to a descent back into history to uncover how a medium developed, focusing less on the myth of progress and inevitability and more on possibility, rupture and contingency. However, 'descent' also refers to descending down into the machine itself, to unpick the realities of its operation (Parikka 2012). This approach is crucial to a project that seeks to provide insights into the material foundation that shapes a machine's affordances and to understand why present media is as it is. One result of this approach in practice is Kirschenbaum's (2008) grammatology of the hard disk drive. This grammatology illuminates both the hard drive's 'forensic' physical materiality, and its 'formal' logical method of encoding and organising information. This project utilises that forensic and formal distinction to interrogate how the interplay between material and organisational structure supported the affordances of prior media forms.

Whilst this paper draws on a definition of materiality that foregrounds the physicality of media artefacts, it does not necessarily seek to supplant the social. Materiality has an uneasy role within the fields of Science and Technology Studies and Communication Studies which this paper draws from as supporting frameworks. The STS social constructivist approach to innovation arose in response to technological determinism, prioritising social shaping and framing materiality as a consequence of the social. Though many STS studies took interest in the material aspects of the technologies studied, materiality's role in shaping the social was often cautiously avoided (Boczkowski and Lievrouw 2008).

In communication studies the role of material attributes of media technology have been foregrounded in the field of Medium theory most commonly associated with Innis (1951), McLuhan (1964) and the Toronto School. For these theorists technology was an agent of change, however their work predominantly focused on *effects*, overlooking technology's development and the intricacies of its operation. For Peters (1999), communications has long resisted the materiality of media due to an entrenched belief in the promise of unmediated knowledge, what we might understand as an immaterial non-mediating medium. Bolter and Grusin (2000) echo Peters arguing that the re-expression of old media in new indicates a striving for an end to the perceptible mediation of media. In contemporary digital media we may have found a medium that is able to remediate all prior forms, and we are increasingly seduced by its immediacy and apparent immateriality. Interestingly our awareness of other media's material foundations often returns when faced with its elimination. Previous mediators such as books, vinyl and newspapers faded from view in their role as conduits of 'content'. Now our awareness of their material form returns as their affordances are examined in light of a different digital mediator. However this new mediator has also faded from view, helped along by software and interfaces that obfuscate the materiality they are wholly reliant upon.

Utilising technical manuals contemporary to the technologies themselves, and historical archives, this paper 'descends' into the Hard Disk Drive and a selection of prior media

forms that helped to define it. The previous technologies: the Phonograph and Gramophone; Magnetic Wire and Tape; and Optical Media, share a common lineage as mediators of audio. However their histories also demonstrate repetition in the mechanics of their operation, illuminate the role of both formal and forensic materiality in their affordances, and all prefigure aspects of the Hard Disk Drive's operation. Together they make up a selective 'genealogy' of the Hard Disk which supports a 'descent' into the realities of one of digital media's key foundations, a foundation that should be recognised if we intend to truly understand what digital media is, and why digital media is as it is.

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