FCJ-063 The Digital, the Virtual and the Naming of Knowledge

Darren Jorgensen, Curtin University, Western Australia.

2 Amidst shifting modalities of culture, inflected with new technologies and changing social desires, university disciplines have experienced seismic shifts in focus. Literature and Cultural Studies are being superseded by Communication Studies, Creative Enterprise, Creative Industries, Converged Media and other such nominalisms. In my workplace, the structure that was inaugurated only a few years before is already looking clunky, an outdated batch of titles and course content. Is it still appropriate to be talking about 'Multimedia'? Are 'New Media', 'Digital Media' and 'Converged Media' sufficiently different substitutes? Are animation and gaming the province of Multimedia, Design, Art or Film and Television studies? From the growing number of enquiries from students about crossing areas we have been forced to look at the relations between them, and yet it seems that no amount of synergy could adequately capture the multifarious interests of a wired generation. We are playing catch-up with a world that has careened out of the control of what Louis Althusser once called Institutional State Apparatuses, state sponsored structures for the induction of workers into the ideologies of twentieth century capitalism. In an increasingly neo-liberal environment, the university looks like a necessary but necessarily inadequate training ground for corporate employees. Companies and institutions want their workers to have degrees but not necessarily to have those critical practices that bring about social change. The responsibility for imbuing technical skills has shifted from the workplace to the publicly funded universities, who now train professions by market demand. When debates around education in the public sphere do take place, they are often on the terrain of industry and its needs. In Australia the situation is arguably worse, since the sheer smallness of the higher education sector makes it more vulnerable to industry pressure groups and the market forces that drive students into different degrees.

3 I want to turn here to the disciplinary troubles brought about by the increasing multiplicity of student needs on the one hand, and the singularity of economics on the other. As a measure of this contradiction I want to examine one term, the "digital", that names the degrees many students US students will now carry with them throughout their lives. Here I will argue that such nominalisms are of seminal significance for the humanities, as they constitute the relationship that knowledge has with the world. To frame this knowledge in terms of the digital is to yoke it to a misrecognition that knowledge is constituted by technology. Certainly the digital is symptomatic of wider changes to economic, social and cultural orders that overreach its theoretical idea. Yet novelties such as the connectivity of computing and mobile devices also obscure the historical continuity of these same orders. The job of educators is to defamiliarise technology rather than to explicate it, to make radical those concepts driving the commercial sphere. So it is that I want to stage an argument against naming knowledge after the digital, and instead argue for the most radical theoretical interventions on the level of this name. In the second part of this paper I make a counter-argument for the use of the term "virtual" as a more effective means for structuring knowledge. This is in order to place a sufficient degree of abstraction between technology and knowledge, and to recapture the university's place as a site of radical interventions.

4 The digital has been used as a way of distinguishing the transmission of information from analogue technologies, the latter transmitting a continuous and variable signal, rather than the absolute and numerical values of the digital. It also refers to the digits that operate interfaces, in an allusion to the labour saved by machines of the hand rather than of the arm and back. By definition the digital is more quantitative than qualitative, though apologists for the digital claim that there is a limit to the amount of information that the human sensorium can absorb, so that the detail of the digital is always bigger and better than the human senses. The shift here is of interest, as the foundations of digital technology in numerical logics coincide historically with the processes of late capitalism that are also grounded in sophisticated techniques for modelling markets. The immediacy of this technology has assisted finance capitalism to reach its current global and virtual extents, high end economic flows determined by pre-programmed purchase and sales levels. This is not to say that the digital is inherently capitalistic. Yet the term does not put sufficient distance between itself and a visible set of technologies at the point of sale, such as

computing and mobile devices. Such technologies are themselves called digital, such that commercial products appear as that which precedes and enables the university's knowledge. There has always been a circularity between disciplines and the world, as education constitutes itself with regard to change. Critical thought has always taken place at the interface between oral and print technologies, between teaching and writing. The university converts this relationship with historical change into this interface, determining the knowledge that reproduces its institutional form. Yet the digital is not driving history, it is not producing a different mode of economic or even socio-cultural production. Digital technologies are instead reproducing social, cultural and economic forms that preceded it. The digital is a metaphor for change rather than the change itself, and it is on this metaphoric level that universities must mount a critical intervention. The digital is part of a continuum of change within a longer duration. These changes are better framed by the virtual.

5 Let's take the example of architecture. In this discipline, the development of Computer Aided Design (CAD) is taken to have generated a new set of forms for designing buildings. Yet such forms also preceded the technology that appears to have brought them into being. The intricate dimensionality of architect Zaha Hadid's work dates from the late 1970s and was first drawn without computers, yet they have every appearance of a CAD design. Complex and organic shapes weave and cross each other in diagonal rather than vertical structures of load bearing. If "computers only make Hadid's work more biomorphic, topological, and sexy", they remain unnecessary to its innovation, a tool rather than a result of their invention (Ryan, 1996: 88). Such innovations, in which the pillar is no longer fundamental to both the construction and design features of architecture, have not been seen in the European tradition since the Gothic cathedral. Yet Hadid's work demonstrates that this shift away from the more contemporary Romaneque is due to more than CAD. It is indeed possible to reverse the reasoning at work here in order to argue that CAD was instead a development of socio-cultural changes, within which Hadid figures as a representative. Why not call this new era of design Hadidesque? The argument has the quality of defamiliarising the intuitive notion that technology is itself a producer, that CAD is itself responsible for building design. A more radical example of such a reversal can be found in the field of media studies, in Raymond Williams' *Television* (1974). He argues that this medium became so popular in the 1950s because nations needed ways to bind themselves together after the war. The dispersal of people from their traditional neighbourhoods and into the isolation of the suburbs, the lack of faith in the nation-state that had led working people into senseless battle, all required a remedy that would manage the continuity and identity of post-war society. Its adoption was determined by a complex of historical and social factors. Such radicalisations of the place of technology in history remain relevant.

6 Visual studies is another discipline in which the digital is contested as a site of knowledge. William Mitchell's *The Re-Configured Eye: Visual Truth in the Post-Photographic Era* (1992) reproduces a McLuhan style history of technology. Mitchell returns to the pre-photographic only to make the point that the visual developments of the Renaissance and the camera obscura were leading up to the seminal invention of photography. History becomes a series of technological interventions that have culminated in the instantaneous, illusionist post-photographic era in which we live. Mitchell's argument is against the realism that has been associated with these previous inventions, against the pretence of perspectival and photographic representations to truth. Instead, the digital reveals the fakery that is already written into the photographic, in a history of history of making rather than taking pictures. It is a clever ploy, but one that remains technologically deterministic, solving rather than problematising the place of new media. For the making of images remains dependent on this continuity of technology, rather than being inculcated into differential sites of historical meaning. The one mode of visualisation folds all too easily into the next, its specificity lost to this march of artifice.

7 The significance of digital technologies and the way in which they determine contemporary thought may well be compared to the way photography has been historicised as a seminal event in the history of vision and culture. Photography is often taken to have changed human life in Europe, if not the world. It brought about, to paraphrase Walter Benjamin, conditions for the infinite reproduction of images and the democratisation of image production. The influence of Benjamin's essay 'The Work of Art in the Age of Mechanical Reproduction' (1968) can be taken as

symptomatic of a trend toward technological determinism in the twentieth century. The argument of this essay, that art objects will no longer be precious in an era of many images, attributes to photography the power to change a modern tradition. Susan Buck-Morss points out that it is in fact possible to argue the very reverse, that in fact the tradition of modern art has only been strengthened by photography, which in reproducing its images tends to increase the value of the original object. Technology then services the structures of power that precede it. Perhaps the most effective revision of the photographic rupture is Jonathan Crary's *Techniques of the Observer* (1990). Wanting to dispute the notion that photography was the latest in a series of perspectival technologies, he turns to the distinctiveness of the camera obscura in the seventeenth and eighteenth centuries. The camera obscura is usually inscribed into the development of better and better techniques for realistic visualisation, and is thought of as a consequence of perspective itself. David Hockney goes so far as to argue that the camera obscura actually determined the course of perspectival image making. Crary instead gives the camera obscura its own distinct place in the history of visual ontology, as analogous to the Cartesian split. From their dark place in the isolation box of the camera obscura, observers configured the separation of their thought from vision. While photography was shared in public space, the camera obscura was the symptom of an era of growing literacy and the interiority of mind, in which knowledge was absolute and contained by a sensibility of stable observation. Sitting in a darkened space offered a model of this mind, from where the subject was able to view the external world as if through a glass, darkly. In Crary's revised history of the camera obscura, technologies are the metaphor for a differential picture of a period of history.

8 Williams and Crary both bring historical constellations of meaning to bear on their respective technologies. Television and the camera obscura are lifted from comparisons to other technologies and are instead cognitively mapped within their times. They are but the vanishing mediators that will give way to questions of a historical and ontological nature. After Williams, we might ask what historical contradictions the digital resolves? If television solved the problems of maintaining post-war nationalism for the state, what problems does the digital address or disguise? What shift in the socio-cultural domain might the digital be indicative of? It would be simple to argue that the digital is symptomatic of developments in capitalism. The internet is then consequent upon its need to link global markets and anti-market structures. Mobile technologies open new, pedestrian and commuting markets. Time is no longer lost in a decentered world that requires connection between disparate geographies. As Rex Butler has argued, the global economy operates in the gap between the world and an imaginary and infinite world of capitalist expansion. For capitalism, the geographical world is not enough. The gap between an imaginary and actual world is transcoded by communication studies into a "digital divide" between the technologically advantaged and disadvantaged. In Marxist terms, the digital divide is itself a false problem, because capitalism is itself uneven, and structurally produces advantage and disadvantage. The digital divide disguises a larger and more fundamental divide at work in the global economy. The lack of technologies amongst the poor is but one of many indicators of disempowerment in global capital. Discourses around the digital divide offer the appearance of Marxism without being Marxism, addressing technology as a cause of inequity rather than its symptom.

9 It is also possible to use Crary's methodology to begin to think about digital technologies within other modes of historical duration. Art history is largely interested in deciphering images to reconstruct the self-perception of the period in which these images were made. Crary attempts to think through the camera obscura in order to establish the qualities of the minds that used it. Is it possible to look back on digital technology as if from some unimaginable future? From a place in which the artefacts of computing bear clues to how this period imagines itself? Here we confront the paradoxical rhetoric of the digital as a state of becoming, as that which we will be. Scholars of the internet often employ such rhetoric. Take, for example, Sherry Turkle's book *Life on the Screen: Identity in the Age of the Internet* (1995), in which the medium "links millions of people in new spaces that are changing the way we think, the nature of our sexuality, the form of our communities, our very identities" (Turkle, 1995: 9). The technology is here a way of self-imagining, the internet a transcendental or quasi-cause of this imagination, that which enables ourselves to become transparent to ourselves, in an equivalence of technology and identity. It is the point here to turn this logic around, so that the internet is both more and less than the way in which we imagine

ourselves, subjectivity less a state of equivalence than one of fracture and complexity. Turkle's subject is historical as it becomes this equivalence. Yet in becoming its vision of itself, it aspires to leave history. How to perceive the present from an imagined future when this future has already been colonised by the present? The answer to the contradiction lies in Crary's methodology, which ranges over all kinds of materials, from philosophy to maps, poetry and scientific experiments. The transcendental signifier here is a consciousness that is itself transcendental, that peers as if from the darkness in the camera obscura into the outside world. The schism that this thought has with itself is the subject of this technology, as it is the subject of the period in all its numerous expressions. The question asked here is just how a technology is located in the more general schemas of understanding that specify a period. Crary sets out to argue with the camera obscura as one example of visual history, as a moment in the ongoing development of technologies of visualisation. So too we must begin to locate the digital in histories that are not technological, to construct a non-technological version of the digital.

10 I want to turn to three cultural histories whose interests construct another possibility for framing the digital, and in the process erase the digital as a site for knowledge. Pierre Lévy's *Becoming Virtual: Reality in the Digital Age* (1998), N. Katherine Hayles' *How we Became Posthuman* (1999) and David Summers' *Real Spaces* (2003) all converge on the term virtual as a way of framing the present state of technological instantiation. Their methodologies are philosophical, literary and art historical in turn, such that the virtual is defined differently by each. Yet it is to the point that the phenomena to which the term points is not dissimilar, providing a useful series of variations and contestations. Could a University, seeking new ways of promoting its cross-disciplinary identities, harbour a Faculty, School or Department of the Virtual? At present the term would appear too abstract, too esoteric. Yet this is precisely the kind of radical intervention that the Humanities needs so as to claim ownership over the knowledge it teaches. Indeed, when my own University can set "Frontier Technologies for Digital Ecosystems" as a research priority, evoking some hybrid of the Wild West and ecological consciousness, it would appear that anything is possible. The flexibility of nominalism may well be exploited by scholars looking to set research and teaching agendas.

11 It is, then, to the virtual that I want to turn here, as a site of meaning constructed by philosophy, literature and art history. Pierre Lévy's method is philosophical. His *Becoming Virtual* (1998) defines the term in deference to a tradition in philosophy that has used it as a measure of potential, carried on most recently by Gilles Deleuze, Felix Guattari and Michel Serres among others, but dating back to medieval scholarship. The virtual is the series of possibilities that tend toward actualisation, yet this virtual is also distinct from the possible as something that is already fully constituted. The example Lévy uses here is the seed's relationship to the tree. Within the seed lies the possibility of the tree, a virtual tree that has not yet been actualised. From this definition it is possible to arrive at a series of terms by which to navigate the artefacts of digital culture. Corporations, for instance, are virtual without always being actual. Virtualisation is the process by which the functions of a business may become steadily more abstract, an abstraction that is likely to include the use of digital technologies. So that a company may shift from mining to finance capital and back again, from manufacturing to carbon trading and onto something else. Virtualisation also describes a wide array of art and heritage practices, from making a record of buildings scheduled to be destroyed to visualising imaginary buildings. Actualisation offers a more troubling set of examples, in which war is carried out after battle plans have been simulated, or buildings are constructed after CAD has visualised them. Its accompanying term is devirtualisation, which realises in the actual world artefacts or events that are otherwise only virtual. So that, for instance, Peter Hennessey's life-size, plywood models of the Sputnik and Voyager spacecraft devirtualise, without actualising, objects that cannot be directly experienced. Skirmish and paintball are other examples of devirtualisation, actualising in the world that which is otherwise experienced only through television, computer games and other modes of mediation. The digital is a subset of the virtual here. It offers one relation among and within other modalities. Here the constellation of terms around the virtual reverses the Baudrillardian logic of simulation in which the virtual brings the real into being. Instead, movements of virtualisation, devirtualisation and actualisation shift between financial, institutional and creative strata. Significantly, Lévy's definition of the virtual shifts visual technologies and cultures away from a relation with the real and its association with truth. The real belongs instead to a photographic order of meaning that proposes

there is some paradigm by which representation models itself. Lévy's virtual, on the other hand, bears no relation to the real, instead creating modalities of meaning that are not indexed to technological modes of enframing.

12 Another historical order is proposed by N. Katherine Hayle's definition of the virtual, this being 'the cultural perception that material objects are interpenetrated by information patterns' (Hayles, 1999: 13-14). This is perhaps the clearest general and cultural definition of the virtual, and one that can be applied to many features of contemporary life. Television today, for example, is full of imagery showing the detailed interiors of human bodies. Two examples illustrate the point. *CSI: Crime Scene Investigation* (2000-) specialises in digital simulations of the paths of bullets through the body, of surgery, hairs and bodily fluids that have been deposited in orifices. Gunther von Hagens, famous for his touring *Body Worlds: The Anatomical Exhibition of Real Human Bodies* exhibition (1995-), also shows the insides of bodies, but this time they are actual corpses. His television program *Anatomy for Beginners* (2006) is also symptomatic of an era in which digital visualisation techniques have become significant tools in the medical repertoire, in which the ability to travel through the insides of the body is enabled by computer generated techniques for three dimensional modelling. Yet here digital techniques for rendering the body are not present. *CSI* is a case of medical virtualisation, while *Anatomy for Beginners* is an actualisation of this virtual, as information that is familiar to patients and their relatives, if not to viewers of *CSI*, are inscribed onto dead bodies. That this is a cultural shift rather than a technological breakthrough is my point here. While *CSI* glamorises new techniques for identifying criminal behaviour and carrying out surgery, it remains a detective drama, its pleasure lain as much in the operation of the detective's mind as in new technologies for visualisation. The digital generation of bodily interiors takes place in a narrative of cognitive revelation, in the operation of thought over and about a corpse. Information conjoins the cognitive with the visual here, Haraway's definition of the virtual being the cultural logic by which *CSI* is understood as a successful television series. The virtual, that transparency of everything to its own informational structure, informs Hagens' *Anatomy for Beginners* too. Yet this information is not revealed through the digital. It comes to vision through the brutal operation of hacksaws and hammers on the bodies themselves. The pleasure here lies in the actualisation of violence upon the body, in the manner of a war staged through television screens and sensors, and yet whose destruction is clearly actualised, its effect taking place within flesh.

13 Hayles' book is also useful in its deconstruction of some of the assumptions technologists have made about the way in which computers will transform human nature. Its target is the quantification of consciousness by cyberneticists who wanted to transcend the body with intelligence. The conditions for consciousness are more complex for Hayles, and her argument comes to centre itself on the body as the site by which the mind comes to its own awareness. Her history of the ideas and personalities behind cybernetics demonstrates the way in which technology is constituted through social and cultural relations. The technology at stake here is computing, and is a part of a constellation of interactions and relations, interfaces and exchanges. These are between bodies of scientific knowledge and ideologies, personalities and acculturations. Attempting to think the totality of these relations, Hayles comes to question the idea that technology possesses some autonomous logic all of its own, as well as its causal relation with the world. Her thesis about the posthuman proposes methodologies for analysis that bypass the assumptions that, first, science is a quantifiable operation and second, that science has reasonable and scientific consequences. Computation and subjectivity are the two historical worlds that Hayles is working with here, the passages between them revealing the enterprise of computing with all of its humanist promise of liberation, and a subjectivity that is, once again, fractured by the divide between science and the human arts. Here Hayles begins to resemble Crary in her return to a human subject situated at the the disjuncture between consciousness and the sensory world. In both cases, technologies play the role of metaphors for the self-alienation of an era.

14 There is a final definition of the virtual that we can include here, this from an art historian attempting to create a global art history. The project, *Real Spaces* (2003) by David Summers, proposes the virtual as a category of visual history. Summers is interested in how virtual space is represented on a surface, how two and three dimensions are mediated by this surface. This history begins in Mesolithic rock paintings and continues through to the perspectival techniques of

the Italian Renaissance. Virtual spaces 'demand *completion* on the part of an observer. Whatever illusionistic force they may have, virtual spaces show what is always at an unbridgeable remove, at a distance in space or time, another present, a past or future' (Summers, 2003: 44). For Summers the order of the virtual is distinguishable from the order of the real because it is that space we do not share with other people. Thus the virtual becomes individualising, and the site of unreal human relations. This is the most conservative definition of the virtual thus far, and perhaps not coincidentally coincides most closely with the history of the visual as the history of visual technologies. From the beginning of his engagement with the virtual, Summers separates his project from the digital. His use of the term, he tells us, was 'chosen well before "virtual reality" became current' (Summers, 2003: 431). His reflexivity here is part of a much larger reflexivity with regard to a history of virtual imaging that largely reduces it to the mechanics of illusion. This illusionism is, however, a component of a more essential structure of human relations. The virtuality of these relations is constituted by doubt, the incompletion of the image that of the incompletion of the other to the self.

15 The examples used by Lévy, Haraway and Summers used to illustrate the virtual are both digital and not digital. They are drawn from different times, places and spaces. These examples make up a continuum of meaning that includes, but is not limited by, the digital, which becomes one of the virtual's many variations. For Lévy, the virtual is synonymous with capitalism, and more particularly the place of labour today. Corporations work toward deterritorialising labour in a virtualisation of its value, and in actualising this value in other territories. A history of the virtual after Lévy would include the humanisation and inhumanity of corporations. It would include the recognition of corporations as legal entities, and a history of their involvement in various types of warfare. For while the abolition of slavery in the US led to the recognition of corporations as human beings with all the rights and obligations of such, the production and sale of weapons by corporations is a sign of their inhumanity, of the consequences of their subjective virtualisation. Here Lévy's definitions of the virtual coincide with Summers' criticisms of its inauthenticity and illusionism. Virtualisation creates a troubling situation for the Humanities here, as the human subject and its labour is no longer a site of meaning. Yet Lévy and Summers turn to other strata of meaning in which life asserts its immanent force. For Lévy the flight of birds is deterritorialising and offers a parallel movement to the virtualisation of capital. In his global art history, Summers describes "real space" or place as a site of distinctive social and cultural relations.

16 The other text being reviewed here, Katherine Hayles' history of cybernetics and information machines, offers another way of historicising the virtual. Hers is an account of the production of technologies of the body and the production of virtual bodies in the twentieth century. It is a cultural history of computing, of an intellectual milieu that anticipated the era of digital technologies. Hayles traces the origins of motifs that are now repeated in digital theory, including interactivity, autopoesis and the self-organising system. The ideas that these scientists were throwing around in the 1950s and 1960s about building intelligent machines were consequent on a cultural environment that would bloom in the late 1960s and 1970s, an era whose youth were more receptive to utopian and libertarian ideas. Hence to this prospective history of the virtual we can add this cultural material, which coincides in the 1970s with the beginnings of Apple and Microsoft from the bedrooms and garages of the young student population (Friedberger and Swaine).

17 Finally we can turn to a prospective project on the relation of the digital and virtual to each other, a project that empties the digital out into a series of sites of knowledge that are not technological. These are philosophical (Lévy), visual (Summers) and socio-cultural (Haraway). These modes of constituting knowledge have the advantage of long durations of historical life, and of relating to sensibilities that are not necessarily implicated in commercial interests. Grouping these knowledges together, the virtual becomes a transcendent site of knowledge, productive of difference. The digital is, on the other hand, immanent to the function of technologies, making its meaning all too easily contained. It is continuous with aspects of the virtual history proposed here, as different disciplinary knowledges converge within digital knowledge systems, cultures and art practices. This history lifts the digital out of its immanence, reconstituting it with regard to traditional disciplines. This is no conservative return to previous regimes of knowledge, but a recognition of the historicity of the digital, its reproduction of existing social, cultural, economic

and vital forms. The digital makes visible that which was already taking place within the virtual, from corporate deterritorialisation to social networking. It puts a technological face on the virtual continuity of regimes of knowledge and power. The humanities has always been interested in complimenting, extending and interrogating the conditions of life in modernity. It may appear, as university's determine new knowledge areas, that the traditional humanities is under threat, that disciplines such as Literature and Cultural Studies are being replaced by other, more technologically mobile areas as Communications, Creative Industries and Converged Media. It is the responsibility of the humanities to make these transitions between disciplines transparent and accountable. What relationship do these new disciplines have with capitalism, knowledge production and the critical role of the university? Nominating a new field of knowledge is at the coalface of the relation between the university and its world. Here I have argued for disciplinary and interdisciplinary titles to be abstract, estranging and productive of differential meanings.

Author's Biography

Darren Jorgensen is currently co-ordinating the Internet Studies program at Curtin University. He has previously published in the fields of critical theory, art, genre and popular fiction.

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