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# Modelling What There Is: Ontologising in a Multidimensional World

Willard McCarty\*

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**Abstract:** »Modellieren was ist: Ontologisierung in einer multidimensionalen Welt«. The incursion of digital computing machinery into the public sphere and the return of "ontology" from philosophical exile occurred almost simultaneously, circa 1948. In this essay I ask, what do the modelling machine and philosophers' irreconcilable accounts of "what there is" have to do with each other? Are the ontological pluralism of the former and the multi-centric multi-naturalism of the latter kin? If so, then recent anthropology has much to say to digital humanities.

**Keywords:** Modelling, ontology, anthropology, multidimensionality, semantic stretch.

[T]he universe has always appeared to the natural mind as a kind of enigma of which the key must be sought in the shape of some illuminating or power-bringing word or name. That word names the universe's principle, and to possess it is after a fashion to possess the universe itself. "God", "Matter", "Reason", "the Absolute", "Energy", are so many solving names. You can rest when you have them. . . . But if you follow the pragmatic method, you cannot look on any such word as closing your quest. . . . [Each word] appears less as a solution. . . . than as a program for more work. . . . (William James, *Pragmatism* 1907)

The worlds in which different societies live are distinct worlds, not merely the same world with different labels attached. (Edward Sapir, *The status of linguistics as a science* 1929)

The only way you can catch yourself in the act of reflecting on yourself is by becoming another self – a self which, when it looks down on your reflecting self, will not be included in the reflection. If you want to understand yourself better, you always have to keep on the move. (Jonathan Rée, *I See a Voice* 1999)

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## 1. A Mid Twentieth Century Co-Occurrence

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These days, for perfectly obvious reasons, some of us find ourselves telling a Spenglerian *Untergang des Abendlandes*. The evening news confirms that we are all going to hell in a handbasket. But when I look around what I see is an abundance of compelling scholarship in many disciplines, scholarship that

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beckons us to interconnect our own work with it and to connect both to the world we live in. The connections to be made are reciprocal and recursive: we give that others may give back, *do ut des*, again and again in a cycle that changes both.

Here my aim is more modest than such a large project would suggest but still indicative of the benefits. My aim is to suggest – I can do no more than that – some of what might result from growing connections with anthropology and related disciplines. Anthropologists, you may know, have been interested in doing the reverse since at least 1962 (Hymes 1965) and were thinking along similar lines from the early 1940s (Heims 1991, chap. 2). Today both sides have much more to offer each other than was the case then.

My story begins with a curious mid-twentieth century co-occurrence in the Anglo-American world: of the digital computer (which must be told what there is) and of the return from philosophical exile of ontology (the study of what there is – or, as Ian Hacking says (2002, 2), of “whatever we individuate and allow ourselves to talk about”).<sup>1</sup> Stumbling on this co-occurrence led me to wonder how the two co-occurrences might be connected beyond computer scientists’ adoption of the term in the late 1970s.<sup>2</sup> You may know that thirty years earlier, just as the public was becoming aware of computers, philosopher Willard Van Orman Quine began giving serious attention not just to ontology but to ontologies in the plural.<sup>3</sup> (In Germany the co-occurrence happened earlier, with Martin Heidegger’s *Sein und Zeit* in 1927 and Konrad Zuse’s Z-series machines from ca. 1935, a year before Turing’s foundational paper.<sup>4</sup>) I asked myself, what might there be in these co-occurrences to help us explain them? But then I noticed something else: the rather dramatic and fruitful career, seeded by Quine, that ontology has taken in theoretical anthropology and related disciplines for the last few decades. So my question became also this: what

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<sup>1</sup> A convenient date for the first public exhibition of a large-scale digital computer is the launch of the Selective Sequence Electronic Calculator (SSEC) at IBM World Headquarters (New York) in 1948, visible from street-level until 1952 (McCarty 2011, viii). For ontology see note 3.

<sup>2</sup> For early examples see Kosslyn 1978 (drawing *inter alia* on Goodman 1968) and McCarthy 1980, Alexander et al 1986. Formal definition came with Gruber 1995. See also Gruber 2009, Sowa 2000 (51-131) and Zúñiga 2001. For related activities in Natural Language Processing see e.g. Margaret Masterman’s work in the 1950s and 1960s (Priss and Old 2009; Sowa 2010 [245-50]); for database design see Sølvsberg 1979; Ramsay 2004 (195).

<sup>3</sup> See Quine 1948, (1953) 1961 (his note on “Identity, ostension, and hypothesis”, p. 169, in particular), (1960) 2013 and 1969. For the status of ontology at the time see Feibleman 1949.

<sup>4</sup> At the very beginning of *Sein und Zeit* ([1927] 2001, §3) Heidegger makes a distinction between ontological (Being as such) and ontic (regional or specific Being, i.e. delimited and implicitly temporal, as studied in the sciences); see Steiner 1978 (79-80). For Zuse’s development of his stored-program computer see Zuse (1993) 2007 (chap. 3). Heidegger’s work became known in Anglophone computer science with Dreyfus 1972 and important in that discipline thanks to Winograd and Flores 1987.

might we learn about the creative potential of digital machines from the scholars of human historical and contemporary alterity?

Nothing in the literature suggests that computer scientists took much notice of philosophy when they started talking about ontology. Perhaps they thought they didn't need to, since ontology is obviously fundamental to computing machinery: after all, to do any useful work the machine must be given a model of what there is (Smith 1985). But the complexity of the world and limitations of time constrain any implementable ontology to be a version of the domain to which it applies, that is, to be an ontology, one of many. Hence the implicit, more specific and possibly important connection between the digital machine and both Quine's and Heidegger's pluralisation.

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## 2. The Popularity of "Model", Many Ontologies and Cosmological Change

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To get further with this, let me take a different tack. When we think about models carefully, as Nelson Goodman did in *Languages of Art* (1968), we can become quite annoyed, as he did, at the ungovernable, viral appeal of the word "model". For us its sloppy use makes its specifically computational sense difficult to pick out; in consequence, we are apt to miss what is genuinely new and so have no convincing answer other than "more, faster" to rightfully skeptical colleagues. But its popularity is an inescapable fact, I realised. So I started to ask, *why* is it so popular? Was the invention of the digital machine a like response, as the coordinated surge of word and thing would suggest? [Figure 1]. Might the same be true for "ontology"? What can we learn from that? What are they responses to? Answers aren't as obvious as may seem: Plato's *Symposium* teaches that we tend to go for what is achingly present in its absence, and so want, and thus desire. Rather than go for a quick dismissal by reference to technological determinism, *pure* coincidence or the fog of a *Zeitgeist*, I wondered if we might be able to identify a Foucauldian "historical *a priori*"<sup>5</sup> – or, to paraphrase Jonathan Rée, that metaphysical notion which, in the middle of the last century, infiltrated ordinary common sense and became a real force in the world (1999, 382).

Consider, for example, Quine's argument that translation is inevitably indeterminate 2013 [1960] chap. 2), from which he concludes that we can do no better than many incompatible stock-takings of the world's goods. Put that next to Quine's friend and reader Thomas Kuhn's argument two years later in *The*

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<sup>5</sup> The phrase is from Georges Canguilhem's review of his former student Michel Foucault's *Les mots et les choses* (1966) in Canguilhem 2005/1967, 90; quoted and discussed in Hacking 2002, 5.

*Structure of Scientific Revolutions* (2012 [1962]) for the inevitability of successive, incompatible, indeed incommensurable paradigms. Consider also my favourite example of a clarion-call within digital humanities: the American literary critic Louis Milic's short article, published four years after *Structure*, in which he wrote that, "We are still not thinking of the computer as anything but a myriad of clerks or assistants in one convenient console" (and I would go so far as to say "a myriad of *servants*", since for us their far quicker, less intrusive and better service is so discrete as to be all but invisible). "The true nature of the machine is unknown to us...", he went on to say (and I would add, unknown because this "nature" is not natural, not a given, but an emergent recursive co-creation of human and machine). Milic saw, as he said, that "Its intelligence and ours must be made complementary....", and so implied the crucial beyond-the-Turing-Test question of what we take intelligence to be. He went on: "Thinking in a new way is not an easy accomplishment. It means", he said, "*reorientation of all the coordinates of our existence*" (1966, 4-5, my emphasis). It means, in other words, a cosmological reconfiguration. He called his brief article, "The next step". It was, I like to point out, the first article in the first issue of the first journal in digital humanities. I don't think we've taken that step yet.

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### 3. The "Ontological Turn" in Anthropology

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I intended no causal implications when I said that Quine seeded later developments in anthropology, though his thought-seed did germinate there. What he actually did, on record, was to draw an analogy between the ontologising philosopher and a fictional anthropological linguist attempting to translate an imagined native's exclamation at the sight of a rabbit (2013 [1960], 25ff.). Such was and is the field anthropologist's dilemma, the core scenario to which some anthropologists have responded by making what has been called "the ontological turn", away from the epistemological angst Quine depicted to something rather new.<sup>6</sup> Commenting on Eduardo Kohn's *How Forests Think: Toward an Anthropology beyond the Human* (2013), for example, Philippe Descola refers to

[the] general predicament that some of us... find ourselves enmeshed in. To put it simply, the project of repopulating the social sciences with nonhuman beings, and thus of shifting the focus... toward the interactions of humans with (and between) animals, plants, physical processes, artifacts, images, and other forms of beings... (2014)

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<sup>6</sup> Increasingly noisy since Henare, Holbraad and Wastell identified "a quiet revolution" and applied the term "ontological turn" to it (2007, 1, 7).

Modelling (we might say) everywhere, of everything, by every being with agency.

The arguments quickly become complex, intricate, difficult. I can only present a sliver. Almira Salmond's helpful overview in the journal *Hau* sorts the enthusiastic confusion this turn has become into "three ethnographic strategies for addressing ontological alterity" (2014): Tim Ingold's, Descola's and the one she favours, which for want of space is my sole focus here. She calls it "recursive" because it draws recursively, transformatively on "the imaginative powers of the... peoples and collectives" whom anthropology proposes to explain.<sup>7</sup> Its leading proponent, Eduardo Viveiros de Castro, defines it in stark contrast to what he calls "our modern cosmological vulgate": the multiculturalist supposition of "a single world or nature... around which different partial cultural views orbit" (2010, 329). This vulgate sounds pleasingly liberal and democratic. Look closely, he argues, and the single world it supposes turns out to be our world universalised. In other words, take a step back and this world begins to look very much like Michel Foucault's invocation of Jeremy Bentham's panopticon.<sup>8</sup> In the late eighteenth century Bentham designed a cylindrical prison with a central watch-tower from which all inmates could be secretly observed. Because no inmate could know when he was being watched, the panopticon induced "the sentiment of an invisible omniscience"<sup>9</sup> – a crippling, economical god's-eye view. Hence the predicament of those entrapped by their very visibility, as Foucault has said, and thus Viveiros de Castro's metaphor for the colonising grip of that panoptic cosmological vulgate.

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#### 4. The Multidimensionality of the Real and Our "Next Step"

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Ontology had to change before the turn in anthropology could be made, from elaboration of a "great chain of being" to a probing which reveals multiple ontologies.<sup>10</sup> The modelling machine, working through many disciplines, has undoubtedly been an influential part of this change, so also the viral spread of the term "model". Remarkably, throughout the panic of relativism in the "science wars",<sup>11</sup> modelling and the many ontologies it makes operational have diversified not destroyed the idea of the real. The anthropologists I have quoted

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<sup>7</sup> Viveiros de Castro 2014 [2009], 40.

<sup>8</sup> Foucault, "Panopticism", in Foucault 1995 [1975], 195-228; plate 3 shows Bentham's design). See Bentham 1995.

<sup>9</sup> A widely quoted phrase, not in Bentham's works, often attributed to an anonymous architect. See Nugent 2011; Lyon 2006.

<sup>10</sup> Lovejoy 2001 [1936]; see also Lovejoy 1909.

<sup>11</sup> Hacking 1999; Geertz 1984.

have responded by taking “the enemy’s point of view” seriously – Viveiros de Castro’s phrase 1992 [1986] – as a recursive instrument of disciplinary self-redefinition. Such recursion is no stranger to modelling. Ancient historian and anthropological fellow-traveller G. E. R. Lloyd has used his half-century of meticulous comparative analyses of ancient Greek and Chinese thought to draw out the “multidimensionality” of the real and to show the “semantic stretch” it requires of us.<sup>12</sup> We might call this the agile modelling of an endlessly faceted world. Thirty-five years ago Ian Hacking, in *Representing and Intervening* (1983), argued cogently that new things become real by means of manipulatory experimental modelling. In his essay “Historical Ontology”, he has asked, echoing Foucault: “if we are concerned with the coming into being of the very possibility of some objects, what is that if not historical?” What does such reasoning lead to if not specific, local ontologies, “molded in time”?<sup>13</sup>

What is to be done with these anthropological, historical and philosophical inflections of modelling gone viral – with the possibilities they suggest and the demanding help they offer for growing nascent digital humanities into one of the *literae humaniores*? That’s the question I struggle with. Half a century on from Louis Milic’s “The Next Step” I wonder what we can say his cosmological reconfiguration would entail if we took it seriously by taking on the anthropologists’ challenge. To use Clifford Geertz’s terms, it would mean something far beyond the mimetic “modelling of” real-world data, beyond also “modelling for” objects that begin as more or less definite ideas and aim at concrete realisation.<sup>14</sup> Both of these will, of course, remain valuable things to do. But they are hardly sufficient for a computing of as well as in the interpretative disciplines. (Let us be done with the crippling fright of the technoscience which makes our beloved machine possible and with the equally damaging ignorance of social thought, and so call these disciplines the *human sciences*.)

What I think taking Milic’s next step might lead to most immediately is a concerted, experimental, hardware-actualised enquiry into what we mean by “intelligence”, by “reason”, by “cognition” – recursively involving *the machine’s point of view with our own as both develop in interaction with each other*. This is not the already well developed programme to demonstrate that cognition is computational, rather to find out through a back-and-forth conversation *what it is*.<sup>15</sup> It would mean enquiring into the machine’s cosmology, as it is now, as it could become. This enquiry would mean, to paraphrase Viveiros

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<sup>12</sup> Lloyd 2015, 5. See Inwood and McCarty 2010, contributions to which embrace all three of Salmond’s ethnographic approaches to ontology. For a summary of Lloyd’s work, <[https://en.wikipedia.org/wiki/G.\\_E.\\_R.\\_Lloyd](https://en.wikipedia.org/wiki/G._E._R._Lloyd)> (Accessed December 19, 2016).

<sup>13</sup> Hacking 2002, 2, 4; Foucault 1984. See also Lovejoy 1909.

<sup>14</sup> For a discussion see McCarty 2013 [2005], 24; referring to Geertz 1993 [1973], 93.

<sup>15</sup> Yes, some of this goes on in the cognitive sciences, but we in the humanities have not included ourselves, nor have these sciences looked often to the humanities for more than window-dressing.

de Castro, treating ideas indigenous to digital hardware as concepts to think with, then following the consequences, defining the range of possibilities these concepts presuppose, the conceptual persona they make possible, the reality they delimit (2014, 187). This is in no way to disrespect the Amazonians and the others from whom Viveiros de Castro and colleagues have learned so much. It is, rather, to ask if we can learn from these anthropologists in turn what it means to pull oneself away from the narcissistic self-entrapment that Joseph Weizenbaum discovered in the mid-1960s when users of his conversational program *Eliza* mistook it for their confessor.<sup>16</sup> It is to ask whether the ontological turn in the anthropological sense has taken hold in digital humanities.

Is it not nascent in what the scholar-programmer already does, most when designing, building and refining simulations? Elsewhere I have argued that the great lesson to be learned from simulation – which is modelling turned loose to go where it can – is that it shows computing to be just such a producer of fiction: an instrument not so much for nailing down facts (although it can do that) but for imagining them, acting them out, solidifying them, in some cases giving us a new (tentative) reality to probe (McCarty 2018). I know of no better example of this than John Wall’s simulation of John Donne’s Gunpowder Day sermon in 1622 as it might have been delivered from the long-vanished Paul’s Cross preaching station adjacent to the medieval St Paul’s, which the Great Fire of London destroyed in 1666. With his *Virtual Paul’s Cross* Wall explores “what we are doing when we believe we have discovered, from our experience with a digital environment, things about past events that are not documented by traditional sources” (2016,283). That’s a cliff-edge, inviting flight, a fiction (to paraphrase Viveiros de Castro) that is historiographical, but historiography that is not fictional: a digital machine’s perspective on the sermon preached on a semi-fictional occasion by a semi-fictional John Donne from a semi-fictional Paul’s Cross in a semi-fictional space to a semi-fictional crowd. Ironically we have very good reason to think that it is a better, more truthful fiction than we get by pretending that Donne’s published words, which he wrote down some-time later from the notes he used while preaching, are the real sermon.

In 1962 Cambridge linguist Margaret Masterman proposed that the computer could become a “telescope of the mind”, changing, as the early telescope did, our whole conception of the world (1962, 38-9). Some toss this off. But is the instrument as unproblematic as her metaphor seems to imply? To echo Hacking (1983, 186-209), do we *see* through, or see *through*, a telescope? Today (just as in microscopy) optoelectronics interpose a hermeneutic black-box between the eye and its object, complicating – but not essentially altering –

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<sup>16</sup> See esp. the introduction to Weizenbaum 1976. Note that according to its author, *Cannibal Metaphysics* is a commentary on an unwritten, fictional book entitled *Anti-Narcissus: Anthropology as a Minor Science* (Viveiros de Castro 2014 [2009], 39).

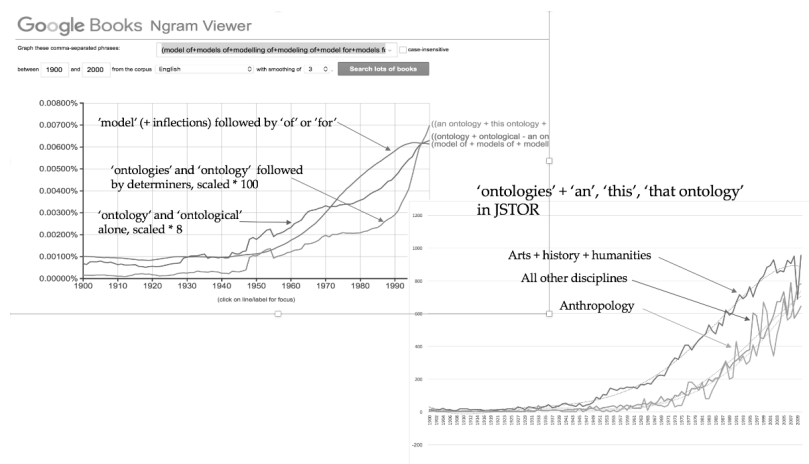


the philosopher's question. For when Galileo looked through his *occhialino* much of what he saw had been seen before, but the differences were enough to make “what was” “momentarily mutable”, stuff of the eye reshaped by his mind into “a compelling argument for Copernicanism”.<sup>17</sup>

Disciplines, I like to say, are not places of arrival, clubs to be joined, identities to assume or platforms of visibility, but starting-points. So the question is: where from here? There are many maps.

## 5. Figure

Figure 1



<sup>17</sup> Thanks to Crystal Hall (Bowdoin) for the commentary on Galileo, in private e-mail, 6/1/17. The literature is extensive; see esp. Lipking 2014; Biagioli 2006, chap. 2.

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## 6. Discussion

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NBD: Nina Bonderup Dorn

RB: Rens Bod

GO: Gunnar Olsson

FJ: Fotis Jannidis

WM: Willard McCarty

In her dedicated response NBD singled out the alterity of worlds, especially its connection with the concept of situated knowledge in her own paper. She questioned the implications of “ontological turn”, asking whether the change is not so much a rejection of epistemological concerns but a product of them and a shift of emphasis. WM agreed, noting the meandering of “turns”, now this way, now that, common in academic disciplines, each turn attempting to correct for prior deficiencies. NBD wanted to know what is “the machine’s point of view”? WM responded by referring to the mediation enforced by the absolute consistency and complete explicitness of the digital medium and to the combinatorial negotiation implicit in modelling. He argued again for the crucial importance of binary logic on the one hand and imaginative play against that foil on the other.

RB noted that the fictionalizing trajectory of computational simulation, as in the example of the *Virtual Paul’s Cross*, is not yet accepted in the humanities. WM pointed to the mistaken belief that the computer is a fact-and-proof machine, a “knowledge-jukebox”, and advocated strong emphasis on the machine as an instrument of the imagination. RB mentioned the corrosive effects of simulation on mind/body dualism.

GO, following up on NBD’s point about the “ontological turn”, offered the arresting counter-metaphor of epistemological and ontological concerns as diachronic intertwined strands, each dependent on the other.

FJ, finally, asked what possibly we can mean by using such words as “intelligence” and “perspective” when talking about machines. He asked if such talk is guilty of a category error. WM thought that the development and adoption of digital machinery was eroding such categorical distinctions, that drawing such lines has a long history of being redrawn to save outmoded ideas of the human. He may have quoted Evelyn Fox Keller, to the effect that asking if a product of computational biology is alive is beginning to look like an historical rather than a philosophical question. And he may have added that “intelligence” no longer looks like a single benchmark.

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# Historical Social Research

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