

Cyborg geographies: towards hybrid epistemologies

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As a mode of critique, the cyborg is often separated from its role as a figuration. This article reviews Donna Haraway's cyborg theory to restate the importance of the cyborg *as a figuration* in critical methodology. Figuration is about opening knowledge-making practices to interrogation. I argue that the cyborg enables this inquiry through epistemological hybridization. To do so, cyborg figurations not only adopt a language of being or becoming, but narrate this language in the production of knowledges, to know hybridly. The epistemological hybridization of the cyborg includes four strategies: witnessing, situating, diffracting and acquiring. These are modes of knowing in cyborg geographies. To underline the importance of this use of cyborg theory, I review selected geographic literatures in naturecultures and technosciences, to demonstrate how geographers cite the cyborg. My analysis suggests these literatures emphasize an ontological hybridity that leaves underconsidered the epistemological hybridization at work in cyborg figuration. To take up the cyborg in this way is to place at risk our narrations, to re-make these geographies as hybrid, political work.

Keywords: critical methodology; cyborg figuration; hybridity; natureculture; technoscience

Introduction

Cyborgs can be figures for living within contradictions, attentive to the naturecultures of mundane practices, opposed to the dire myths of self-birthing, embracing mortality as the condition for life, and alert to the emergent historical hybridities actually populating the world at all its contingent scales. (Haraway 2003a, 11)

Cyborg geographies enact hybrid ways of knowing. This article argues that the cyborg's frequent citation as a literal marker for machinic-organic life has clouded the role of the cyborg *as a figuration*. While geographic literatures have cited the cyborg to signal an ontological hybridity, the epistemological hybridity of cyborg figuration has been less explored. I take this argument up to articulate a renewed critical methodology in geographies of naturecultures and technosciences, as these are the domains of cyborgian inhabitation. It is a call for greater specificity of the cyborg as an artifact of feminist critiques of science – a specification that actually broadens its use. Haraway's premising of the cyborg as a machinic-organic hybrid points to its more ontological usage. However, the larger purpose of this hybridization is to know differently our relationships with nature and technology – a partial knowing that requires both ontological and epistemological hybridity. Ontological hybridity is about contingent beings and about forms of becoming that challenge dualist narratives, like human/machine, nature/society and the virtual/real. Geographies of naturecultures and technoscience have each interrogated these kinds of

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hybridities (Kitchin 1998; Whatmore 2002; Swyngedouw 1996; Schuurman 2002). However, to not engage the cyborg as an epistemological hybrid is to be inattentive to the partial and contingent practices of knowledges-in-the-making.

As the epigraph by Haraway alludes, cyborgs are about both *living* within and remaining *attentive to* the contradictions of technoscience and naturecultures. The cyborg is therefore a simultaneous being/becoming and knowing/seeing conduit through which to conduct critical study. Human geographers have only partially made use of this conduit, for example in studies of identity in cyberspace and of urban ecologies. I argue for more attention to cyborg epistemologies in these spaces to further ground our critical projects in their study. I situate this proposal in research that explores boundaries and boundary-makings, such as work in naturecultural geographies that challenges scholarly convention in studying the city and the wild, and technoscientific geographies that explore the contingencies of technological and cultural production. How do we narrate the production of knowledge in these geographic subfields and what is the role of cyborg theory in these narrations? To address this question, I propose a re-reading of cyborg theory, such that narrations of knowledge-in-the-making are conceptualized as a witnessing, situating, acquiring and diffracting – epistemological hybrids of the cyborg.

I begin by revisiting the work of Haraway, from cyborgs to her recent writings on companion species, to demonstrate how figuration works to *do* subjectivities and knowledge productions differently. Indeed, her work has influenced geographic study, namely in two directions: to bolster feminist critiques of the production of spatial knowledges and as a series of jumping-off points for studies of technologically-mediated spaces and human–animal relations. This article is framed as primarily a critique of the latter and an extended contribution of the former. Following this review of the cyborg as a figuration, I develop techniques for researching and writing these geographies. In the final section, I demonstrate my argument in the study of technoscientific and naturecultural space-times, by surveying the cyborg concept in selected geographic literatures. It is important to recognize how hybrid bodies are made in the process of these studies, as risky knowledge-making endeavors are inevitably messy and rife with boundary-crossings. This recognition involves an incessant questioning of *how* we know, *how* we theorize. If the ‘cyborg’ is left to stand for only the hybridity of being, then how do we engage the cyborg’s political project of working knowledges and risky subjectivities? I argue that this engagement emerges through epistemological hybridity – by placing knowledge-making actions within the messy and risky realm of creative, strategic, fallible encounters and by becoming historically aware of the everydayness of our technological adaptations.

Cyborg figurations

Over two decades after she offered her ‘manifesto for cyborgs’, Haraway’s reaches into the metaphorical and the figurative remain a rich source for critical engagement. The cyborg is both a site and sighting for boundary crossings, framing the tension for this article. The cyborg can seem to be an academic trend and while its use stretches across popular culture, cultural critique and technological innovation, it is a particular process of critique and critical engagement that deserves further consideration. Here, I emphasize figuration and the cyborg as an example of figuration, to consider its role in writing critique. What is at stake is how we know what we narrate, in projects that research the multiplicities of bodily representations through innovations like cyberspace, urban ecologies, GIS and bioengineering. These are innovations enacted through hybridity; I argue that cyborgs are writing devices to narrate these hybridities.

Figuration is Haraway's overarching approach in critique, while recognizing Prins' (1995) argument that it is impossible to distill a methodological agenda in her research. Figuration is her aid in narration. Just as authors provide figures to illustrate arguments, figurations illustrate worlds. Haraway chooses figurations that have 'real' meaning and then reclaims their purposes in critique, and in this sense, figurations trope. Examples include the cyborg, gene, brain, chip, database, ecosystem, race, bomb, simian, species and fetus (Haraway 1991a, 1997, 2003a). As reclamations, these figurations act as entry points. Cyborg figurations walk worlds and as Shields (2006) suggests, the cyborg shares tendencies with *flâneur*. Haraway (2000, 138) describes such figurations as stem cells, '[o]ut of each one you can unpack an entire world'. Figurations are a kind of radical personification – an inhabiting of figures with the purpose of narrating (Gane and Haraway 2006). The point of doing so is:

to make a difference in the world, to cast our lot for some ways of life and not others. To do that, one must be in the action, be finite and dirty, not transcendent and clean. Knowledge-making technologies, including crafting subject positions and ways of inhabiting such positions, must be made relentlessly visible and open to critical intervention. (Haraway 1997, 36)

The making of knowledge is the action of figuration, to open it to a radical visibility. It is this visibility that enables intervention through the un-working and re-working of knowledge production – to inspire an always partial storytelling of (post)modernity. These figurations seek to move beyond polemics and the either–or jousting of certain feminisms, specifically identity politics, by entering (in order to undo) their dualistic fields of operation.

Figuration is neither entirely figurative nor literal; its political prowess lies in its ambiguity. Figurations transcend rationalities and invoke multiplicity, but motivate a kind of objectivity through embodied perspective. This is described as the inhabiting of performativities (Haraway 1997, 179). Figurations are about arrangement, as a series of arguments or the composition of an image. In this sense, figurations are deeply spatial, as they are representative. Indeed, Haraway (1997, 11) invokes a mapping sense of figuration:

We inhabit and are inhabited by such figures that map universes of knowledge, practice and power. To read such maps with mixed and differential literacies and without the totality, appropriations, apocalyptic disasters, comedic resolutions, and salvation histories of secularized Christian realism is the task of the mutated modest witness.

Figurations map. However, these are maps of contingency and relationality. In other words, figurations form geographies, to inhabit them. That figuring is a matter of inhabitation, and that this inhabitation enables a critical visioning is the epistemological rooting of this sort of ontological messing. In a poststructural vein, Haraway is interested in what gives these figures their particular shapes and what challenges permeate their shaping. This is a renewed storytelling – of re-situating these knowledges in ways that may contradict their usual moorings. In this sense, figurations both map and dis-map with their enrolling of 'mixed and differential literacies'.

The cyborg (short for cybernetic organism) is an image being continually drawn, fabricated, figured since its 'birth' in the 1960s – as the technoscientific processes of (post)modernity enable these images/imaginings. The cyborg figuration emerges from Haraway's need to tell certain truths about scientific processes. She crafts a position (a site/citation) from which and within which to objectively narrate. The cyborg is thus a material-semiotic entity, employed as a figuration in Haraway's critique of military-industrial relationships with science and technology. As a narrative device, the cyborg is

composed of complicated and contradictory associations: of technologies and biologies, virtualities and physicalities, discursivities and materialities. It is complicit in generative projects of difference. The cyborg begins, after all, as the ‘cyborg enemy’ (Harvey and Haraway 1995, 514) – an enemy that needs to be reclaimed, or queered, into new possibilities. To engage in generative projects of difference, the cyborg advances a re-writing of the narratives about military–industrial relationships with science and technology. However, not all cyborgs tell these particular stories (cf. Gray 1995, 2000; Balsamo 1996; Stone 1995; Foster 2005; Halberstam and Livingston 1995).

Her interest in the cyborg is detailed in her ‘manifesto for cyborgs’, reprinted in a collection of essays titled *Simians, Cyborgs, and Women* (Haraway 1985, 1991). In this manifesto, Haraway introduces cyborgs as transgressing three boundaries: between human and animal, organism and machine, and the physical and the non-physical. She situates these transgressions in the ubiquity of electronics and their embeddedness in various practices, organizations, industries and militaries. It is this pervasiveness of the microelectronic that marks the potential for a cyborg manifesto, that in these moments when ‘the difference between machine and organism is thoroughly blurred’ we can recognize ‘totalizing theory is a major mistake’ and can take ‘responsibility for the social relations of science and technology’ (Haraway 1991, 165, 181). Here, Haraway is addressing the feminisms and Marxisms of the 1980s as they come aground in the massive movements of capital around the development of communication and biological technologies in Silicon Valley, California. By insisting on the heterogeneity forced by our microelectronic and bioengineered present, Haraway sees the political and ethical potential for hybrid subjects – that in these moments of intense diversification of economies emerge multiple kinds of subjects, resistive and contradictory. The micro(electronic) (bio)politics of the cyborg makes it a trickster in its opposition to grand narratives of progress, domination and emancipation. The cyborg project illuminates, for instance, the heterogeneity of gendered identity and insists on the construction of its supposed naturalness. Cyborg vision thus ‘sees’ an ontological hybridization premised on hybrid epistemologies. Without such epistemological and ontological visioning, critiques of knowledge practices remain routine and lack the riskiness of embedded narration. Routine critiques of knowledge practices are those that lend themselves too easily to determinisms and constructionisms, the slippage of ‘the-machine-made-me-do-it’ and the convenience of relative perspective.

From this initial manifesto, cyborg figuration grows into an entire book project, allowing Haraway (1997) to explore this kind of storytelling, of working within figurations. Two major parts make up the project: semantics and pragmatics. The first part emphasizes a meeting between a post-gendered post-human, FemaleMan© and a technically-‘enhanced’ mouse, OncoMouse™: the former an elaboration of a science fiction character, the latter the first patented animal, ‘developed’ by Dupont to harbor cancerous cells. Here, Haraway exercises her figuration’s strength as a narrative device, to place in conversation literary fiction about post-gendered identity and genetically-altered/infused, cancer-growing rodents. The second part considers how the cyborg, again as a writing device, embodies a troubling of boundaries, between the technical and political. Here, she discusses the gene, race and the fetus as a few of several stem cells in which she places responsibility for the legitimating knowledge systems of the world. These stem cells illustrate her call to a particular, embodied witnessing of scientific practices: figurations. Here, Haraway draws feminists to the practices of science and technology, to challenge reactions against objectivity and fiction, and to complicate feminist concerns with reflexivity.

In her *Companion Species Manifesto*, Haraway (2003a) introduces a figuration to interrogate human–nonhuman relationships: the companion species, specifically the dog. Companion species are about historicizing our relationships with animals, as mediation for biotechnology’s colonization of the genome. Haraway (2003b, 56) is intrigued by dogs as they are beings that are not-us; this figuration enables a worrying of the nature/culture binary, as ‘dogs are neither nature nor culture, not both/and, not neither/nor, but something else’. These narrative devices are about *entering into* these histories, by writing their associations. Through inhabiting the narrative and exceeding ‘the maze of dualisms’, the cyborg insists not on a ‘common language, but of a powerful infidel heteroglossia’ (Haraway 1991a, 181). These kinds of figurations require work, Haraway (1999) argues, and working hybridities are those that are exposed and are made vulnerable, ‘where epistemological and ontological risk define the name of the game’. To provide an example of working hybrids, Haraway (1999) examines a series of reports produced by the Scientific Panel of the government of British Columbia, Canada, to address conflict surrounding forestry practices on Vancouver Island. The alliances formed represent worked knowledges wherein the entities participating put themselves at risk, to challenge what it means (and why it matters) to have sustainable forest communities. As a method, if it could be one, the cyborg works knowledge-making enterprises, but the question remains of *how* to practice this critical methodology.

I have underlined the cyborg’s role as a figuration: as a narrative device, to embed and craft associations, to historicize differently. The purpose is to enter into these storytellings, to make a mess of fact/fiction, subject/object and mind/body. This sort of work opens up human geography to new political geographies of contingency, relationality and difference within semiotic *and* material borderlands. The cyborg embodies these spaces, as a hybrid, to practice the production of knowledges. Hybridity is thus the means and ends to this knowledge production – a kind of working hybridity, where subjectivities are re-made in boundary crossings. Working hybrids invoke multiplicity, contingency and blurred, unraveling boundaries between body and machine. They produce worked knowledges. Our relationships with microelectronics and dogs are indicative of working hybrids and worked knowledges – where all entities are altered in the process of association, where the line of association itself is blurred into near invisibility. These alterations, I argue, have two dimensions, ontological hybridity and epistemological hybridity, the former having been the more convenient usage of the cyborg, the latter an underutilized resource in critical geographic research. By not remaining attentive to the epistemological hybridity of the cyborg, we lose the critical politics of figuration – to make knowledge-in-the-making a visible practice.

Epistemological hybridity as strategies

The richness of the cyborg concept allows us to negotiate a multiplicity of spaces and practices simultaneously and in so doing *develop epistemological strategies*... (Gandy 2005, 40, emphasis added)

The resourcefulness of the cyborg stems, I argue, from its epistemological hybridity and the risk that comes with knowledge co-productions. The citation of the cyborg as an ontological hybrid – as a troubling of ontology – can mask this resourcefulness. To challenge this masking, I suggest how the cyborg figuration enacts epistemological strategies, as proposed by Gandy above. Figurations invoke multiple ways of being/becoming and knowing/seeing; as such, they are both epistemological *and* ontological. In this section, I develop the epistemological strategies of cyborg figuration,

as it is these strategies that I argue have been subsumed in our fascination with ontological hybridity.

The cyborg has been taken up to mean and signal a litany of cultural production and critique. I advocate a return to cyborg theory, to recover the 'epistemological subtlety and political prescience' of the Figure (Gandy 2005, 28). The purpose of these risky, working hybrids is to not only provide a language of being or becoming, but to narrate this language in the co-production of knowledges. If ontological hybridity is concerned with what it means to *be* hybrid, I suggest that epistemological hybridity considers what it means to *know* hybridly. Here, I propose a cyborg geography that is attentive to these ways of knowing.

To *know* hybridly, I argue that cyborg figurations take up the language of witnessing, situating, diffracting and acquiring. I have distilled these strategies from Haraway's writings of the cyborg and of companion species, from the lab to the kennel. It is a language taken up elsewhere in geography as feminist epistemologies (Rose 1997; Cope 2002; England 1994; Katz 1994; McDowell 1992; Lawson 1995). I refine this language of epistemological strategy to speak to the figuration of the cyborg. In arguing that these modes of epistemological hybridity are strategies of cyborg figuration, I broaden what is potentially enabled in the use of the cyborg. This is a re-activation of the cyborg, to intervene in narratives of knowledge production, to challenge their knowledges-in-the-making. These four interventions should be read as epistemological strategies in cyborg geographies.

Witnessing

The cyborg emerges from a need to witness: to observe, to provide an account and to be present. By placing the cyborg within the strategy of witnessing, I underline the critical impetus for this figuration. For Haraway, the title of her self-help manual is the fictive e-mail address of such a witnessing, *Modest_Witness@Second_Millennium* (1997). Her cyborg is paradoxically a witness situated in modesty and yet challenges the kinds of modest witnessing (observable truths) of science. Here, Haraway recounts female and male modesty, to draw certain distinctions. 'Female modesty was of the body; the new masculine virtue had to be of the mind' (1997, 30). Her modest witness was to be simultaneously of 'the self, biased, opaque', just as it was also transparent and objective (1997, 32). Witnessing was to be an embodied act of providing an account. The paradox of the modest witness, of being both objective and subjective, is inhabited in order to narrate the encounters of technoscience and natureculture. Haraway's historical irreverence continues as we read her e-mail address. Second Millennium situates this witnessing, making visible that our time is literally situated in Christian salvation history – the second millennium of Christ's birth. Here, Haraway calls on the language of witnessing to historicize Science's co-implication with the salvation narrative. To understand this witnessing, Haraway stresses the need to historically situate, to 'know those worlds' (1997, 37) in which our subject-object relations are situated and to realize the fiction 'we are forced to live ... whether or not we fit that story' (1997, 43). In doing so, Haraway grounds/embodies these narrations as a witnessing that is simultaneously partial and yet objective. She writes of a witnessing, that is 'seeing; attesting; ... a collective, limited practice that depends on the constructed and never finished credibility of those who do it' (1997, 267).

Haraway's delight in this kind of cyborgian witnessing allows her to challenge reactions against vision. Instead of avoiding or revoking the concept of vision, she seeks to rework the concept, to insist on a kind of 'seeing' that is necessarily partial – but no less a fact. This is a witnessing distinguished from relativism. By witnessing, we open up the

practices of knowing – uncloaked from scientific rationalisms. Figurations do this work of witnessing – acting as a pivot to draw in the various contingencies and contradictions of knowledge-making practices. Witnessing is a visioning of the various enactments and positionings of knowledge-in-the-making. Geographers need this cyborgian witness to be attentive to a multiple situatedness, not from the single perspective of Author, but from the appended collection of authors-in-the-making.

Situating

Situating knowledges is a second epistemological strategy in cyborg figuration. The cyborg is witness to such situatedness – to counter, Haraway (1997, 188) argues, ‘a leap out of the marked body and into a conquering gaze from nowhere’. However, the concept of situated knowledges does not indicate that our claims need to be grounded, or put in place. This is not a simple geography of perspective. Haraway seeks to clarify this misreading:

... it is very important to understand that ‘situatedness’ doesn’t necessarily mean place ... Sometimes people read ‘Situated Knowledges’ in a way that seems to me a little flat; i.e., to mean merely what your identifying marks are and literally where you are. ‘Situated’ in this sense means only to be in one place. Whereas what I mean to emphasize is the *situatedness* of situated. In other words it is a way to get at the multiple modes of embedding that are about place and space in the manner in which geographers draw that distinction. (2000, 71; emphasis original)

Similarly, Gillian Rose (1997) has taken up this concern about situated knowledges in geography. Rose suggests that Haraway’s situated knowledges are bound up with vision. Situated knowledges are, as Rose (1997, 308) writes, a ‘siting [that] is intimately involved in sighting’. Situating knowledges requires powerful figuration and imagery; it is a tool for visioning difference. Cyborgs are sites from which to witness this ‘situatedness of situated’. Witnessing and situating are co-dependent practices in cyborg geographies. To inquire about technoscientific and naturecultural encounters, geographers must inhabit figurations to ‘see’ and ‘place’, witness and situate, the multiplicity of relations that make our cyborg geographies. As figurations, cyborgs witness the various knowledge practices that constitute objects and subjects and the differences that are made – to situate, call attention to, the work that places or endows them with a geography. As a hybrid epistemological strategy, our recognition that the ‘geography is elsewhere’ for these figurations, is about their multiple and often contradictory placings (Haraway 1991b). To be attentive to this cyborgian situatedness, geographers have the responsibility to place these knowledges-in-the-making, not with some reified, exacted place, but as a placing – an objective, yet contingent, collusion of objects, subjects and spaces.

Diffraction

Cyborg geographies adopt a politics of diffraction. In opposition to an epistemology of reflexivity, diffraction is resistive to reflections. The point is to make a difference. Haraway (2000, 102) works the notion of reflexivity in feminist methodology, to oppose repeating the ‘Sacred Image of the Same’; instead, diffraction is a recording of the ‘history of interaction, interference, reinforcement, [and] difference’. Haraway uses the science of optics to draw a distinction between reflection and diffraction. The passage of light through a crystal separates light into its individuated bands; this sort of diffraction is about recording these various passages. Whereas reflections enable the mirror-images of

ourselves elsewhere, diffractions work the image, to change the figuration, to alter the politics and to construct knowledges differently. Hers is a different optics of politics, a 'pattern [that] does not map where differences appear, but rather maps where the effects of difference appear' (Haraway 1992, 300). As witnessing is about 'seeing' and situating is about placings, diffracting is about changing knowledges, reconstructing knowledge practices such that alternative understandings of these knowledges emerge.

Diffraction works to tell new stories of technosciences and naturecultures – doing so requires not the mirror-image of reflexivity, but a visual metaphor based on difference and the enacting of differences. Diffraction, then, takes up various accounts, witnessed and situated, in order to radically alter them. It is therefore not enough to reflect on one's co-implication in knowledge practices; rather, it is our responsibility to diffract, to document the difference generated by such knowledge practices. Diffraction is the mantra of the unbeliever, to resist incredulously our accepted experiences about knowledge-in-the-making, to enable different explanations within differing geographies.

Acquiring

Cyborg geographies engage in acquisitions to know hybridly. Acquiring, as an epistemological strategy, asks us to take risks in building working alliances to further interrogate naturecultures and technosciences. These risks could involve learning from the observed, taking up their discourses, to diffract, to alter these knowledge productions. That material-semiotic entities acquire each other and 'make each other up, in the flesh', is the kind of ontological and epistemological risk present in working hybrids (Haraway 2003a, 2–3; 1999). Beyond essentialized alliances, acquiring, as an epistemological and political strategy, is to 'remain accountable to each other' (Penley and Ross 1991, 4). Further, to acquire is to become vulnerable to alternative, even contradictory, discourses – doing so enables a kind of hybridizing diffraction that messes knowledge practices based in reflection, extraction and synthesis.

While Haraway works the concept of acquiring after the bulk of her cyborg project was published, I suggest that acquiring is an epistemological strategy of cyborg geographies. The cyborg, after all, is an acquiring figuration – drawing in multiple, incongruous projects, such as projects of destruction and domination as well as projects for the enhancement of (non)human life. The pervasiveness of contemporary boundary crossings requires our permanent availability to hybrid ways of knowing; we have the opportunity and responsibility to acquire and become open to change. This, I believe, is complemented by the kinds of openness – of co-productions – that permeates Massey's (2005, 148) conceptualization of space as 'contemporaneous multiplicity' and as 'under construction'.

Acquiring is one tactic for new imaginations of political responsibility in scholarly endeavors. It is a strategy for knowing hybridly – to allow the unknown and the alternatively known to inhabit our ways of knowing, to alter them permanently. Certainly, the discipline of geography is haunted by its legacy of acquisition. What I am suggesting here is not a return to those troubling acquisitions, but an ethic of making knowledges by working those hybrid encounters which place us at risk – to acquire one another in an enacting of responsible collaboration.

In this section, I have discussed a series of knowing practices – epistemological strategies – to consider the cyborg *as a figuration*. In the following section, I demonstrate how the cyborg's role as a figuration is lost in geographic literatures on naturecultures and technosciences. Haraway's attentiveness to the spaces of knowledge production (the corporate laboratory, the genome archive and the kennel) should give geographers pause,

to critically consider how our cyborg geographies are timed and spaced in important ways, and *how* we know what we narrate. By attending to these spaces for hybrid ways of knowing, we embrace the messiness of our boundary-work and remain responsible to the entities that populate our space-times – human, nonhuman, posthuman, cyborg, etc.

Working knowledges in natureculture and technoscience

In the geographies of natureculture and technoscience, there is a tendency to understate (or miss altogether) the epistemological hybridity of the cyborg figuration and instead connote ontological, categorical instability. I demonstrate that this is a missed opportunity to know hybridly the relations and adjacencies of knowledges-in-the-making. To take seriously cyborg figuration, geographers must expand notions of hybridity beyond being or becoming. The inclination towards ontological hybridity might emerge from human geographers' concerns about the centrality of the 'human'. These concerns unravel the monoglossia of the human sciences, to decentralize what we imagine *to be*. Accordingly, hybridity is invoked to draw in other kinds of entities (animals and the computer), to destabilize notions of being and becoming – to ontologically hybridize. The cyborg often signals this ontological hybridity in geographic literatures, drawing upon the more common understanding of the concept: the 'hybrid of machine and organism' (Haraway 1991a, 149). By pushing back on this citation, I argue that geographers need to go further in their engagement here. I examine their engagement in selected geographic literatures about naturecultures and technoscience, and argue that within each the citation of the cyborg works less as a figuration for hybridly knowing and more as a signal for hybrid beings/becomings.

Cyborgs in naturecultural geographies

The discomfort with the centrality of the human in human geography leads Sarah Whatmore (2004) to prefer the 'more-than-human' concept, as opposed to the posthuman. Here, Whatmore problematizes how temporality is invoked in posthumanism (see also Braun 2004). She reflects on her earlier work in *Hybrid Geographies*, a treatise on the production of naturecultural knowledges:

Using various devices to push hybridity back in time, I sought to demonstrate that whether one works through the long practised intimacies between human and plant communities or the skills configured between bodies and tools, one never arrives at a time/place when the human was not a work in progress. (Whatmore 2004, 1361)

The question of 'the human', as a work of 'practised intimacies', remains. Whatmore (2002) attempts to move beyond dualisms and, for her, hybrid geographies are spaces wherein dualisms like human/nonhuman and nature/culture are untenable. By thinking hybridity in this way, as the impossibility of binary thinking, Whatmore destabilizes nature–society traditions in geography – to demonstrate how this way of interrogating 'nature' intimates the 'social'. Here, Whatmore historicizes urban relationships to the wild, from Roman uses of animals in the gaming arena to scientific inventories and animal management. She tacks between embodied, while partial, accounts of natures–societies and critiques of science through actor-network theory, and seeks to 'practice geography as a craft', to demonstrate the centrality of 'wild(er)ness' to the social (Whatmore 2002, 3–4). While Whatmore's investigatory motivations are insightful, I push back on her interpretation of cyborg figuration, as her reading illustrates how the cyborg has been limited to an ontological hybridity. I examine Whatmore and Eric Swyngedouw's citation

of the cyborg, to ask what work it performs in their naturecultural geographies, to consider: what is enabled by the cyborg in naturecultural geographies?

Naturecultural geographies are concerned more broadly with the nature–society tradition of the discipline and hybridity is indeed one conceptual tool for problematizing this perspective. Energized by debates on the social construction of nature (Demeritt 2002), geographers have troubled the boundaries constituted by the nature–society tradition (Gerber 1997), thereby exploring the relationships between the natural and the urban (Swyngedouw 1996; Gandy 2005; Castree 2003; Braun 2005) and between animals and humans (Wolch and Emel 1998; Whatmore 2002; Philo and Wilbert 2000). Responsibilities and connectivities are at stake in these debates – responsibilities to multiple ways of living and concepts of life and connectivities to those other, constitutive entities.

Whatmore (2002) exercises caution in her use of the cyborg, finding the cyborg a useful ontological figure, while being less enamored with the potential of the cyborg, epistemologically. She draws on the cyborg to illustrate the hybridity that was always present in our relationships with the ‘wild’. She recognizes the disruptive potential of the cyborg (1997), to de-purify the natural and the social. This de-purification works in an ontological sense. Further, she finds the cyborg less capable of expressing the material corporeality of nature–society connections.

[A]lthough Haraway’s account of hybridity successfully disrupts the purification of nature and society and relegation of ‘nonhumans’ to a world of objects, it is less helpful in trying to ‘flesh out’ the ‘material’ dimensions of the practices and technologies of connectivity that make the communicability of experience across difference, and hence the constitution of ethical community, possible. (Whatmore 1997, 47)

That there is a tension in the concept of the cyborg as per Whatmore’s reading is clear. Considering the cyborg concept limited by a ‘one-plus-one’ logic, Whatmore (2002, 165) instead suggests a hybridity ‘defined less by its departure from patterns of being that went before than with how it articulates the fluxes of becoming that complicate the spacings-timings of social life’. For Whatmore (2002, 187n16), cyborgs are ‘couplings ... [where] difference is prefigured in the alterity of already constituted kinds’.

The cyborg figuration, for Whatmore, is not a site of inhabitation. This inhabitation is necessary to take seriously the role of witnessing, situating, diffracting and acquiring. Cyborgs, in Whatmore’s reading, are simply the possibility of becoming one from multiple beings/things. They operate less as figurations, accordingly they are not inhabited or points of entry or narrative devices. We are left, then, with a concept of the cyborg that is anemic, unable to take risks, to see (witness) and place (situate) differently, to fold in (acquire) and alter (diffract) knowledges-in-the-making. This is a cyborg-in-passing, a relic of 1980s cultural production.

While Eric Swyngedouw uses the cyborg as an entry point into historical-material analysis of the urban, I want to push his use of the cyborg – to enact the kinds of risks that come in narrating urbanizations. He writes of the ‘city as cyborg’ to mark urban processes around water as intimately linked to bodily arrangements as well as regional and global relationships (Swyngedouw 1996, 80). More specifically, his entry point is a cup of water, to examine the connectivities between the urban and nature. By doing so, he emphasizes the city as a hybrid, telling stories of ‘its people and the powerful socio-ecological processes that produce the urban and its spaces of privilege and exclusion’ (Swyngedouw 1996, 67). The cup of water symbolizes – figures – his entry into multiple discussions of urbanizations:

of participation and marginality; of rats and bankers; of water-borne disease and speculation in water-industry related futures and options; of chemical, physical and biological reactions and transformations; of the global hydrological cycle and global warming; of the capital, machinations and strategies of dam builders; of urban land developers; of the knowledges of the engineers; of the passage from river to urban reservoir. (Swyngedouw 1996, 67)

By analyzing water in this way, Swyngedouw demonstrates the city as a hybrid – partially composed of the relationships mentioned in the preceding quote.

Swyngedouw's use of cyborg and hybrid are nearly interchangeable, both invoking a composition of various complementary and contradictory elements. He employs cyborgs to package a multiplicity of natural–urban environmental productions (Swyngedouw 1996, 1999, 2006; Swyngedouw and Kaika 2000). As Bakker and Bridge (2006, 17) point out, this invocation of the cyborg serves to emphasize the production of hybrids, or the 'process of hybridization'. Similar to Whatmore's reading of the cyborg as a 'coupling', Swyngedouw cites the cyborg to emphasize the productive combinations within the urban, referenced in his quotation above. By taking up the cyborg as a figuration, I suggest that the processes of hybridization could be opened, through the epistemological strategies of the cyborg. It is Swyngedouw's (1996, 1999) cup of water that needs this witnessing – to remain partial and open to multiple and risky narratives about political, cultural and economic normativities as well as micro resistances and inconsistencies.

My selection of naturecultural geographies by Whatmore and Swyngedouw demonstrate the tension around usage of the cyborg concept – in the former, a reading of the cyborg not as a figuration, but as a coupling and in the latter, a reading of the cyborg as emergent, assuming a pre-cyborgian condition, emphasizing the production of hybrids. This has demonstrated a need for a resuscitation of the cyborg citation, to recognize its potential for witnessing the situatedness of urbanization and urban study, to recognize their co-implicated discourses. What would it mean to write the cyborg city, where the objects of analysis illustrate the differences produced by their study, in an always-incompleted project of working knowledges and inconclusive evidences?

Cyborgs in technoscientific geographies

Technoscientific geographies have the potential to enroll cyborg figuration, to witness, situate, diffract and acquire the multiplicities of subject-objects in space-times. However, I argue that citations of the cyborg in these selected studies of cyberspace and geographic information systems associate the cyborg with a narrow ontological hybridity. Without sufficient attention to hybrid epistemologies, these technoscientific geographies miss the opportunity to make knowledges of difference. What remains is a technoscience of the same – a kind of inquiry that leaves technological knowledge production unchallenged and furthers a project of technological advancement by the few. To write cyborg geographies of technoscience, geographers must foreground the cobbled-togetherness of technoscientific practice – to elaborate their messy inceptions and risky encounters.

Technoscience indicates an alternative telling of (post)modernisms, wherein the productive tension between science and technology serves to exceed these very distinctions, including mind and body, subject and object, human and nonhuman, nature and society (Haraway 1997, 3). Technoscience is Haraway's emphatic rejoinder to scientific rationalism. The cyborg figure is the narrator of this rejoinder, to 'bring the technical and the political back into realignment so that questions about possible livable worlds, lie visibly at the heart of our best science' (Haraway 1997, 39). Within geography, a limited literature explores the geographies of technoscience, to distinguish among

historical geographies of science and the histories of the geographical sciences (Powell 2007). The geography of technoscience is concerned with the production of scientific and technical knowledges, particularly how these productions constitute spatial relationships among nature, society and technology. This research examines the practices of statisticians (Barnes 1998), high-energy physicists (Jons 2006), transgenic food production (McAfee 2008) and the gendering of office technologies (Boyer and England 2008). Although geographies of cyberspace and critical geographic information systems have not been cast explicitly as technoscientific study, here I consider how two researchers have drawn upon technoscientific critique – specifically that of the cyborg. I extend this critical lens to Rob Kitchin and Nadine Schuurman's use of the cyborg in technoscientific geographies, to discuss the absence of the cyborg as a figuration involved in hybridly knowing.

The permeation of cyberspace into everyday life is what Rob Kitchin (1998, 394) terms 'cyborging'. Identity is multiply produced in cyberspace and cyborging, according to Kitchin (1998, 394), describes the 'merging of nature with technology, as humans and computers coalesce'. Kitchin and Kneale (2001) also enroll the concept of cyborging to discuss cyberpunk fiction. Kitchin's usage of the cyborg concept is a marker for hybrid identification. Cyborging, for him, is a process of unification through merger and coalescence – the becoming of one, identifiable subject. Cyborging is a writing device to invoke hybridity, through analyses of lives lived online and literary fiction. This device, when used in cyberspace, according to Kitchin, enables a user to actively create identity, *to cyborg*. Cyborging is this process whereby '[u]sers literally become the authors of their lives' (Kitchin 1998, 394). It is this hybridity-in-the-making that draws Kitchin (1998, 395) to the cyborg concept, where cyberspace subjects 'play' with 'fantasies, ... othernesses, ... [and] crossdressing'. Cyborging in cyberspace is about enacting hybrid identities in virtual and imaginative geographies. However, I stress that this notion of 'cyborging' is limited to an ontological dimension. To enroll cyborg figuration is to witness and situate these productions of cyber-identities, beyond a recognition of their made-up becomings and towards a critical visuality. Cyborging, as I alternatively read it, is not only coalescence, but also the always-unfinished project of attesting to the ways of knowing self and other in the network.

Similarly, Nadine Schuurman (2002, 2004) calls for 'writing the cyborg', arguing for increased use of GIS by women and underrepresented groups (Schuurman 2002, 261). To 'write the cyborg', or 'perform the cyborg' as Kwan (2002, 276) has stated, is to invoke the cyborg as a process. Schuurman draws upon Haraway's notion of cyborgs in the construction/use of geographic information technologies, countering critiques of its potential surveillance capability (Kwan 2002). For Schuurman the prospect of GIS in the hands of the surveilled is a reworking of the technology in a cyborgian tone. Schuurman seeks to challenge the masculine inception of the technology, by actively re-rendering the technology from a feminist perspective operated for/with female/other bodies, described as 'strength in numbers' (Schuurman 2002, 261). Her 'feminist cyborg' seeks to 'make GIS and geography a more equitable place not only for women but for many underrepresented and less powerful groups' (Schuurman 2002, 261). Like cyborging in Kitchin's (1998) review of cyberspace research, the point is to actively constitute the possibility of hybrid becomings. Schuurman (2004, 1337) traces the concept of the cyborg:

The cyborg of the 20th century was an amalgamation of technology and humanity. Using a computer to write, having a locator chip installed in your dog's ear, or programming military-industrial applications all warranted the designation. Any confluence of silicon with animal or human behaviour and presto: a cyborg. Cyborgs of the 20th century had less to do with data

than with silicon. The very fact that they incorporated computing was enough to earn the designation 'cyborg'. . . . 'New' cyborgs are, however, more than metal and flesh; they come to life in the presence of data.

Schuurman argues that twenty-first century cyborgs are not necessarily made of microelectronics, but data. This use of the cyborg symbolizes a hybridity of being – of being/becoming more-than-human in an intermeshing of data and electronics. Our interactions with computing technologies designates our *being* cyborg. Further Schuurman (2002) advocates that the political challenge is to enable a feminist cyborg, by emphasizing the role of marginalized populations in the production of GIS knowledges. While one aspect of the feminist critique of science was to advocate the placement of more women in science positions (and to make more visible those women who are scientists), Haraway instead proposes situated knowledges – so as to avoid essentializing women's role in (scientific) knowledge productions. The role of gender is multiply interpreted in cyborg figurations, according to Haraway (2003a; see also Wajcman 2004) and Schuurman 'writing the cyborg' is indicative of this tension. Haraway's (2003a, 47) political potency was to use the cyborg to resist militaristic, 'man-in-space' projects, while also narrating their implicatedness in technoscientific agendas. Schuurman's use of the cyborg illustrates for her the complicated arrangement of humans and technology, without further asking what kinds of knowledges are made in these arrangements and how these knowledges may be made differently. Instead, Schuurman's citation of the cyborg figuration is to mark bodies *as* cyborgs and does not inhabit the cyborg as a strategy in narrating knowledges-in-the-making.

The cyborg, as in the selected literatures above, often references a being/becoming hybrid – emphasizing the ontological connotation of the concept. I argue that an opportunity has been missed in this citation. Beyond 'writing the cyborg', 'performing the cyborg', or 'cyborging' (each constitutes hybrid ways of *being*), *knowing* hybridly requires an inhabiting of the figuration of the cyborg – to see the relationships and connectivities of naturecultural and technoscientific practice. To know hybridly, I argue for a return to the knowing practices of the cyborg, based on witnessing, situating, diffracting and acquiring.

Conclusions

We know, from our bodies and from our machines, that tension is a great source of pleasure and power. May cyborg, and this *Handbook*, help you enjoy both and go beyond dualistic epistemologies to the epistemology of cyborg: thesis, antithesis, synthesis, prosthesis. And again. (Gray, Mentor, and Figueroa-Sarriera 1995, 13)

What would it mean to introduce oneself as a 'cyborg geographer', in the same sense that we introduce ourselves as human geographers? How do we complicate our own proclivities toward the 'human'? As cyborg geographers, we are responsible for being attentive to the partial and contingent practices of knowledges-in-the-making. This responsibility is two-part. First, we must recognize knowledge-making actions as creative, sometimes strategic and often fallible encounters. Second, we must be historically aware of our multiple adaptations in these actions. As Gray, Mentor, and Figueroa-Sarriera (1995) provoke a taking-up of their handbook in the above quotation, they encourage the use of the cyborg *as an epistemology*. This signaling to the cyborg as a device, to be enrolled and invoked, parallels my insistence that figuration of the cyborg requires an inhabitation, to be *and* know hybridly. Cyborg geographers use figurations to fulfill their responsibilities.

In the midst of geographers' explorations of the cyborg in terms of an ontological boundary messing, I have argued that the cyborg's potential as an epistemological hybrid is underconsidered. Therefore, I have taken a more specified understanding of this hybrid epistemology as one of figuration. This is not to say that ontological hybridity is not important for cyborg geographers; indeed, knowing hybridly is steeped in being and becoming hybrid. However, I argue that what is at stake in knowing hybridly is *how* we know what we narrate. Cyborg geographers are interested in this question of how we know, but not in lieu of creating action. As hybrid beings interested in how we know, cyborg geographers emerge from their embedded narrations to warn against determinisms and constructionisms, to flag critiques that have become too routine. This is a responsible action – a responsibility fulfilled by recognizing our implications in knowledge-making-actions. The recognition of our implications enables the writing of these geographies of contingency, relationality and difference. This writing becomes the creative action of the cyborg geographer. To practice this writing, I have suggested four strategies: witnessing, situating, acquiring and diffracting. That these ways of knowing are always an attempt to complete an incompletable whole is the name of the game. Partiality *and* objectivity are strange bedfellows. And yet the cyborg geographer enacts their coordination.

Following Haraway and limited geographic literatures that cite the cyborg, I have proposed witnessing, situating, diffracting and acquiring as methodological endeavors, to know hybridly. By knowing hybridly through these strategies, knowledge practices become grounded throughout narratives about naturecultural and technoscientific phenomena. While these strategies are indeed co-dependent on the ontological hybridity of the cyborg concept, I highlight these to both return to the cyborg as a theoretical concept and to ground this concept as a figuration. I propose cyborg geographies as a call to take these hybrids seriously, to recognize that hybridly knowing is bound up in becoming and being hybrid. At stake is our action to know – to not only recognize differences produced in techno-nature-culture worlds, but to inhabit these spaces of difference and become responsible to their vulnerabilities. Hybridly knowing is knowing-at-risk.

That the cyborg is foremost a figuration in Haraway's work frames my insistence on close readings of geography's dabbling with the cyborg, to consider the geographies of the cyborg and the potential for further critique in a cyborgian tone. As a figuration, the cyborg is a writing technology. By invoking the cyborg in this sense of knowing differently, we also conjure certain hybridities of knowing. These hybridities live within and through our writings. There is work to be done in the cyborg geographies of natureculture and technoscience. This is a call for cyborg geographers to:

- inhabit the spaces where the human and nonhuman are constituted and narrate the conditions that established this entry point;
- resist even temporary stabilizations of urban study, by recognizing urbanization as an always-incompleted project of working knowledges;
- foreground the messy and risky spaces of technoscientific practice;
- articulate the moments in which self and other are known in the virtual; and
- question the knowledges made through human–technology assemblages, so as to create the possibility that they may be made differently.

To conceptualize this work, I have suggested a re-reading of the cyborg figuration, to inspire some strangeness amid the popular familiarity of the cyborg. I have found it helpful to consider Massey's re-conceptualizations of spaces as taking a similar approach.

Massey seeks to disrupt our narratives about space and poses a series of challenges to geographers: how to narrate, how to spatialize, how to mis/represent, how to situate and position, as well as how to (not) obfuscate, how to seize/cease production/representation, how to complicate, etc. Cyborg geographies forward this disruption. It is a political project of knowledge-in-the-making, of knowing hybridly – of finding coeval kinship in knowledge endeavors.

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ABSTRACT TRANSLATION

Geografías cyborg: acercándose a las epistemologías híbridas

Como una forma de crítica, el *cyborg* es muchas veces separado de su rol como figuración. Este artículo da una reseña de la teoría del *cyborg* de Donna Haraway para reafirmar la importancia del *cyborg como una figuración* en la metodología crítica. La figuración se trata de abrir las prácticas de producción de conocimiento a la interrogación. Sostengo que el *cyborg* facilita este interrogatorio a través de la hibridización epistemológica. Para hacerlo, las figuraciones *cyborg* no sólo asumen un lenguaje de ser o volverse, sino que narran este lenguaje en la producción de saberes, para saber híbridamente. La hibridización epistemológica del *cyborg* incluye cuatro estrategias: presenciar, situar, difractar y adquirir. Estas son formas de saber en geografías *cyborg*. Para subrayar la importancia de este uso de la teoría del *cyborg*, hago una revisión de una selección de literaturas geográficas sobre naturaleza-culturas y las tecnociencias para demostrar cómo los geógrafos citan al *cyborg*. Mi análisis sugiere que estas literaturas remarcan una hibridez ontológica que deja poco estudiada la hibridización epistemológica involucrada en la figuración *cyborg*. Entender el *cyborg* de esta forma significa poner en riesgo nuestros relatos, rehacer estas geografías como trabajo político, híbrido.

Palabras clave: metodología crítica; figuración *cyborg*; hibridez; naturaleza-cultura; tecnociencia

半机械人的地理：走向混杂的认识论

半机械人作为一个批判的模式往往与它负起的比喻角色有所分隔。这篇文章综述了唐娜·哈拉维的半机械人理论来重申半机械人在批判方法学作为比喻的重要性。比喻是为了质问种种营造知识的实践。我认为，该半机械人能够通过认识论的混杂来促使这个调查。要做到这一点，半机械人的比喻不止要采用成为或即将成为的言语来描述，该语言也应讲述知识的生产，以便得到混杂的认知。半机械人的认识论的混杂包括了目睹，情境，衍射和获取四个战略。这些是半机械人的地理中认知模式。为了强调半机械人理论在该运用方面的重要性，我审查了特定关于自然的文化以及技术科学的地理研究来展示地理学家如何引用半机械人。我的分析表明，这些研究强调了本体论的混杂，因而忽略了认识论的混杂在半机械人的比喻中所扮演的重要角色。以这种方式来对待半机械人，我们把论述摆在危险的处境，并重新塑造半机械人的地理为混杂式，政治化的工作。

关键词：批判方法学，半机械人的比喻，混杂，自然的文化，技术科学