



# Various Shapes of Cultural Biosemiotics

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Received: 18 August 2017 / Accepted: 27 October 2017 / Published online: 7 November 2017  
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**Abstract** There is a steady and maybe growing impulse in biosemiotics to open itself to the arts and humanities. Recent events and publications indicate a desire expressed by biosemioticians and non-biosemioticians to engage in a dialogue concerning the manner in which living systems are cast, understood and dealt with, a dialogue that will determine the future course of those fields of research. In this article, I react to two recent monographs on the subject, Paul Copley's *Cultural implications of biosemiotics* (2016) and Wendy Wheeler's *Expecting the earth. Life, culture, biosemiotics* (2016). After a close reading of these two books, I then briefly present certain issues that shed a different light on cultural biosemiotics: human pressure on other-than-human organisms, domestication and reproductive rights.

**Keywords** Biosemiotics and culture · Nature-culture · Margins of biosemiotics · Interdisciplinary dialogue · Co-construction of humans and other-than-humans

## Introduction

By now, the history and shape of biosemiotics is well established (Favareau 2007). Biosemioticians contributed, and are still actively contributing to a paradigmatic shift in our understanding of life, drawing it away from a physicalist or mechanist framework (where living processes are reduced to efficient causes) to a one where life is considered as a meaningful and intentional phenomenon. Life is not just about molecules, but also about signs, signs that are at play in the biochemical make-up of slime-mold, in the orientation of leaves and branches, in the flight patterns of birds, in the language development of humans. Because life is perfused with signs, organisms are actual subjects (not machines), they have experiences (they are not involved in simple exchanges of data), they are said to learn and adapt (they are not driven by some

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vague explanatory principle like instinct), they evolve with their environment (and cannot exist torn, abstracted from the world). A quick look at research being done in biosemiotics reveals, among other things, that whatever biosemiotics *is* (field, discipline, science, research agenda, etc.), it is doing a wonderful job at clarifying the manner by which living systems create and transform sign relations and how, between themselves, those living systems exchange signs.

By embracing sign relations in living systems, it was generally implied – or taken for granted – that linguistic, political, symbolic exchanges, the phenomena and objects of a narrowly understood and construed logocentric human culture, are relegated to the realm of the humanities. This, in itself, is paradoxical: indeed, semiotics as it unfolded in the writings of structuralists and poststructuralists, was in many cases politically committed. These thinkers (for example, and to varying degrees through their careers, Barthes, Derrida, Kristeva) did not shy away from political debate, but embraced it. Why was this commitment (generally) ignored by biosemioticians? In addition, why are biosemiotic approaches to human culture (typically) bound to an ontological argument – “biosemiosis is a source, an origin for human cultural experiences” –, but tend to disengage when it is time to actually interpret the more problematic consequences of nature-culture expressions? Human culture is also *alive* so to speak. Therefore, shouldn't biosemioticians take into account this naturalness? Though it (generally) shies away from human issues, biosemiotics may be on the cusp of an important transformation. Indeed, as we can see after a close reading of Paul Copley's *Cultural implications of biosemiotics* (2016) and Wendy Wheeler's *Expecting the earth. Life, culture, biosemiotics* (2016), some biosemioticians are actively engaged with questions relating to human culture. Without actually reviewing these books, I propose to examine some key components of these two monographs in order to indicate another possible path uniting nature and culture through semiotics.

### **Copley's *Cultural Implications of Biosemiotics***

Copley argues that the arts, ethics, codes, human modelling systems are all, in a sense, properties that emerged from life. Culture emerged from nature. Following on Peirce's synechism (1992a), stating the seamlessness of the universe, Copley reflects upon the “continuity of semiosis across nature” (2016: 3). This continuity links not only matter, but also minds, and, crucially, matter and minds all together, transcending the infamous Cartesian dualism. The body is key in getting around such a difference, in that it translates or adapts the inner world to the outer world. Equally important are the interpretative capacities of organisms and the creation of species-specific *Umwelten*. One of the unique characteristics of the human *Umwelt* is that it allows for “projecting possible worlds: fictional projections and ethical projections as well as those associated with logic, science and Thirdness, and the ability to make educated guesses, or as Peirce would say, ‘abductions’.” (Copley 2016: 8) This is possible mainly because of the “verbal language's recursive potential” (Copley 2016: 8), the fact that humans (semiotic animals) developed, through language, a symbolic capacity for using and recognizing the evolution of sign patterns.

In essence, what Copley retrieves from biosemiotics, and what he puts to use in his analysis of cultural semiosis, is not only the fact that signs are exchanged throughout

the living world, and that those signs create experience and subjectivity, but also the fact that humans, as animals, have the unique capacity to grasp signhood from which experience and subjectivity emerge – something rarely expressed in common conceptions of the nature/culture link. Copley writes:

While biosemiotics has inculcated conceptions of agency and semiosis, cultural analysis has been less receptive to calls for it to contextualize the human in terms of its natural heritage. [...] It is thus probably true to say that most discussions of culture take place as if in an evolutionary vacuum, with only very partial thought given to the rest of the natural world in which culture is embedded. (2016: 24–25)

Copley considers that the arts and humanities have, generally, ignored biosemiosis (ignored semiosis in the living world and ignored their own rootedness in that same living world); this is basically why he writes his book. Himself from the humanities, Copley turns against “the arts’ and humanities’ traditional refusal to translate from the sciences or even engage with them” (2016: 25). The isolationism of the arts and humanities, their sacrosanct autonomy, is not only unrealistic, but also out of step with the investigations and discoveries of the (natural) sciences.

In this case, language, though it is a uniquely human modeling system, is not completely abstracted from the material/natural world, from our organic bodies that developed skills for communication and speech. Considering the interdisciplinary quality of biosemiotics, Copley states that “Biosemiotics presents a synthesis of human knowing in which it is continuous with semiotic processes in other organisms” (2016: 42). In championing the idea of co-evolution of language and brain, biosemioticians can argue that artistic expressions, ethical/political stances and other symbolic practices, do not appear *ex nihilo*, but depend upon millions of years of living, natural semiotic evolution. A necessary outcome is that selfhood (or agency) is also natural, through and through. Indeed, bodies are thriving swarms of cells in continuous communication (endosemiosis); and those bodies communicate among themselves (exosemiosis), and not only through the channel of language, but by manner of chemical signals, movement, radiation, sound waves, electrical fields, etc. It is precisely because biosemioticians consider language and agency as phenomena that emerged from the natural, material world, that they readily assume an anti-humanist political stance. Copley writes: “Biosemiotics’ insistence on continuity from endosemiosis and across nature to the sphere of human affairs is already political in its vivid counterposition to modern liberal humanism” (2016: 47–48). Copley is obviously not adopting here the viewpoint of biological reductionism – an oversimplified explanation of culture and society in biological terms where the agents’ freedom is completely absent and which does not, *cannot* account for the fact that living organisms make choices that are *not* commanded by genes. Rather, he is asking us to acknowledge the facts that some dimensions of life are heavily controlled while others are more autonomous, and that these two realms of restriction and flexibility are necessarily coupled.

Contrasted to the (economic) agent of rational free will, biosemiotics outlines a new approach to ethics where individuals (self and others) are first and foremost grounded in organic matter and semiosis. Copley does not lay out an agenda, or propose bioethical policies. Rather he reframes the ethical question in order to fuel “biocentric human responsibility with theoretical practice” (Copley 2016: 71). In this perspective,

ethics no longer concerns the human, glottocentric value voluntarily given to others – humans, animals, plants, protists, fungi or bacteria. Rather, ethics concerns the manner in which we humans, as critically aware sign-users, can responsibly commit ourselves, or act in regards to biosemiotic processes (given our initial relation to/dependence on them) taken in a global context. Cobley refers to this as love, resonating with Peirce's doctrine of agapism (1992b). Cobley thus envisions a world where the human, the exceptional animal that knows it uses signs, "is compelled to care for semiosis or, by association, all life on the planet" (2016: 123), in other words, assuming some sort of stewardship over nature and "presiding [...] over the diversity of semiosis" (2016: 123). By embracing synechism – the interdependence of all things, living or not –, semiotics and biosemiotics are thoroughly political even if, as Cobley states, they appear not to be (2016: 71). Two reasons can explain the apolitical appearance of bio/semiotics. First, bio/semioticians typically refrain from prescribing actions, policies or codes of conduct, behavioural checklists that could guide us in our daily lives. Second, we are so accustomed to seeing politics being practiced in terms of dialectical conflict, that we have forgotten that a holistic, global perspective, more peaceful, homeostatic and conservative, is political in the first place.

At this point we are zeroing in on a key cultural implication of biosemiotics. If ethics also requires stability, Cobley argues, it is essential that we renew our understanding and appreciation of a type of invariance manifest across living systems. The field of childhood development clearly indicates that there is a certain degree of repression or constraint in the ways we build our relations with others (be they of first, second, or third order; through the body or through words). Thus we develop relatively predictable habits and routines that structure and sustain our lives; we generate redundancy that counteracts to a certain extent, or puts a brake to the infinite growth of semiotic freedom. Restraint can obviously be *willed*; but Cobley's point is that in many cases, we exhibit restraint *beyond* our will. Intellectuals associated to structuralism and poststructuralism did a wonderful job in reminding us that our decisions were not always reached through a deliberate and autonomous act of rationality: decisions are, if not conditioned at least profoundly influenced by our desires (psychoanalysis), by power associated to social class and money (Marxism), by the structure of language (linguistics/*sémiologie*). Cobley's claim is that decisions (the most outwardly manifest ones that riddle our daily, social lives) are also informed by the biosemiotic relations that made and continue to make up organisms, both at the level of the individual and of the species.

*Contra* the idea that language can only serve to create limitless novelty, Cobley reminds us of its restful and pacifying quality, precisely what is involved in degrowth (for more on this notion, see Demaria et al. 2013). If there is one prescription we could venture from reading Cobley's book, it might be the following: thirdness and that seemingly unstoppable, capital-fuelled (and fuel-injected) machine of human culture, could, should slow down and rethink itself. In this sense, Cobley insists that we recognize and protect a certain pointlessness, or incompleteness of the humanities (what Cobley refers to as the *anti-humanist humanities*), an incompleteness that mirrors the one in nature argued for by Terrence Deacon (2011). Indeed, the disciplines of arts and language enable us to touch something that is not there. This focus on absence, writes Cobley, reveals "the human propensity for fictionality" (2016: 121), a fictionality that was paramount for humans to adapt themselves to the world, and to adapt the world to themselves.

Finishing Copley's book, we are left with many questions concerning what cultural biosemiotics is or can do. A few should be exposed.

First, there is a certain political/ideological ambiguity in Copley's book: this ambiguity can actually be stimulating and, in any case, it is unavoidable in that living processes cannot be partitioned into simplistic models of political behaviour. But sometimes ambiguity can be tendentious. For instance, Copley ends his fourth chapter, "The Natural Subject" with a curious remark where he seems to lambaste the whole field of gender and queer studies, an academic trend of sexual otherness loosely associated to the left, qualifying its work as "squeamish prevarication" (2016: 58). I think I see what Copley is getting at: the scope of otherness implied by "highly specialized sexual practices" (Copley 2016: 59) are *minor*, so to speak, compared to the plethora of biotic relations that make up living systems. However, I am not sure that his harsh focus on gender issues is an effective way to build bridges with other communities – let alone if it adequately grasps the full potential of those issues (something I do not myself claim to master). This tangent culminates, at the end of Copley's fifth chapter, trenchantly titled "Ethics cannot be voluntary", with a heteronormative claim according to which parental love is the proper model of semiosis. However, we could say that friendship, a democratic, dialectical and sometimes chosen solidarity, is probably a more appropriate model for certain relationships in nature, for example in the case of symbiosis. On this particular issue of care, gender and queer theory within ecological debates (Mortimer-Sandilands and Erickson 2010) has proven itself to be not only relevant but also absolutely necessary. Equally relevant is María Puig de la Bellacasa's recent research on soil care (2015), intersecting science and nature. Care goes in all directions, it circulates. A caring relationship is precisely that, a *relationship*; if we start attributing roles to agents, we risk objectifying them at which point the relationship becomes secondary. Therefore, we should question the ideological assumptions behind Copley's proposal to endow humans with a special "presidential" status.

As previously mentioned, Copley also accepts a certain apolitical *appearance* of global semiotics that could pass as conservatism (see his generally critical vision of discursive politics 2016: 70–72, and a co-authored paper, Cannizzaro and Copley 2015). Adopting a holistic, biosemiotic perspective of the world may be useful – it is one way we can think of and with contemporary widespread environmental damage. But we should ask ourselves what happens when we insist, in today's world, on the importance of constraints and the respect of unifying habits that keep in check novel impulses. This is not only a *theoretical* construction, but also an *ideological* position that should be interpreted in the light of contemporary social and cultural upheavals. Biosemioticians *also* rely on discursive and thoroughly ideological constructions. We find indications of this in Copley's work. Indeed, he is generally critical of structuralism and its heirs. At one point Copley even seems to imply that the latter's glottocentric experiments are interchangeable with, or causally linked to the humanistic rational worldview that gave rise to liberal capitalism (tying up Modernity in a sweeping gesture – inviting readers to conflate structuralism with the recent banking scandals 2016: 71–72). But then Copley also hails the anti-humanist agenda of what could be referred to as left-leaning disciplines, such as post-colonialism or media studies, that question "the fragmentation of contemporary identity" (2016: 111–112). There seems to be a hesitation, or a fruitful tension in Copley's book concerning the status of

continental post/structuralism and the loosely defined cultural studies; that tension can serve as a real catalyst for thought and should be exploited.

Finally, a turning point in Cobley's book occurs at the end of the fifth chapter devoted to ethics, after explaining a distinction drawn out by Giorgio Agamben between *bios* and *zoē* (the former referring to the way of life of an individual or a group, the latter referring to the fact of being alive shared by all organisms). This distinction, writes Cobley is "not one that is utilised in biosemiotics" (2016: 70), principally because the distinction is linguistic and blinds us to the fact the individuals and groups are always already living. Cobley adds:

The state may conflate *bios* and *zoē* for political purposes, to maintain particular kinds of power relations. However, beyond the recognition of a relationship of dependency between the non-human and human aspects of the biosphere, the distinction has little explanatory benefit for biosemiotics in general and for its discussion of ethics specifically. (2016: 70)

Here, I think Cobley is *describing* a certain situation. However, I think biosemioticians can do two things, namely: study sign relations within and among living systems (call this core biosemiotics, or biosemiotics proper); and reflect on the discourses that harness life, from a biosemiotic perspective or not. Cobley himself mentions that "semiosis 'in nature' is more frequently subject to the vagaries of socio-political forces than is often acknowledged" (2016: 116). What could happen if we started to acknowledge these forces? And, more specifically, what could happen to biosemiotics? I will return to this question later.

### **Wheeler's *Expecting the Earth. Life, Culture, Biosemiotics***

In *Expecting the earth. Life, culture, biosemiotics* (2016), Wheeler continues the exploration of relational semiosis in living systems, and the connected social, artistic, and technological issues, that she had already examined in *The whole creature. Complexity, biosemiotics and the evolution of culture* (Wheeler 2006). In her latest book, Wheeler could have limited herself to foundational biosemiotic texts and ideas; however, she also includes some that are less influential in biosemiotics proper, notably the work of Georges Simondon, Gilles Deleuze and Félix Guattari. In my mind, this heritage-blending is not only absolutely commendable, it is also necessary if biosemioticians wish to engage with others. Indeed, we speak to others and are understood by them, not only by using our own words, but also by using the words of our interlocutors.<sup>1</sup>

In the twentieth century, researchers in the fields of human sciences, social sciences and the arts had the tendency of resisting biology. This was unfortunate, as organisms – including humans – are always embodied, engaged in a non-stop flow of biological,

<sup>1</sup> In his recent review of this *Expecting the earth*, Thierry Bardini (2017) sheds light on certain limitations of the book in regards to Simondon's relational ontology and its history in biosemiotics over the last decade. What distinguishes my close reading from Bardini's review is that I wish to expose her use of cultural biosemiotics – which appears quite similar to Cobley's – in order to contrast it to another nature-culture semiotic project in the third part of my text.



biosemiotic processes, conditioned by and creating its worldly experiences, even when they make political decisions, when they create works of art, when they move on and transform the Earth's surface. As any organism, the human participates in the complex network of genes, proteins and cellular interactions, in the determination of self, in the stabilisation and destabilisation of its ecosystems. Mind and body grow from each other. This is why individuals and species present structural and functional similarities. Even the most abstract (i.e. ideal, rational, linguistic) manifestations of semiosis, evolved from organisms, they had "to spring from an organism's necessary senses of world and flesh, had to be remembered, to be inherited, grown and adapted in ecological relation" (2016: 4). Organisms may express inventive and creative behaviour, but they also express habits that reproduce and transform themselves over millions of years. There are patterns of meaning, and this explains why many signs work in the first place. Wheeler repeatedly quotes an excerpt from Peirce's "The Basis of Pragmatism in the Normative Sciences": "It seems a strange thing, when one comes to ponder over it, that a sign should leave its interpreter to supply a part of its meaning" (Peirce 1998: 394). But, as Peirce will go on to say, this incompleteness of the sign that must be filled by the interpreter, just shows that the "universe is perfused with signs" (Peirce 1998: 394) – in other words, that things, interpreters and meanings are all tied up, expressed through the ever-growing web of semiosis.

Organisms participate in the creation of reality; this does not imply that without us, the world disappears, but rather that with us, through our actions, circuits of information and meaning are triggered. What is this information? When I learn, for instance, that there is a terrorist attack, or when an airborne molecule serves as a signal to a bull moose that a cow in heat is nearby, or when cells exchange calcium in order to regulate enzymes and proteins, the information is not in the actual objects or events, but rather in the relation that is created – a relation that means something to the organism that experiences or is affected by it. This is a process of "turn[ing] information into meaning" (Wheeler 2016: 61). As Wheeler is quick to point out, the reasons why biologists had (and some still have) difficulty in accepting this, can be explained by their difficulty in admitting the reality of teleological processes where the subject (a relation) creates itself according to its inner and outer experiences. The subject reads itself and reads the world because it can recognize and relate to patterns it finds there. It knows what to *expect* – as Wheeler's title makes clear – because similar situations have been dealt with for ages. Organisms have been projecting themselves, acting on and rethinking habits, since the first unicellular life forms appeared on Earth approximately 3.8 billion years ago. The appearance of multicellular organisms a billion years ago, the rich diversification of complex organisms during the Cambrian explosion some 500 million years ago, the age of forests and the resulting land expansion of animals some 380 million years ago, only serve to show how quickly and densely this semiosis spread. The growth of organisms and of behavioural patterns rested on, and continues to invite expectations which have, in the words of Wheeler

great causal power. [They] will shape what an organism does and how it develops, and will make changes in the world it inhabits. Every day of our lives, we – and other animals – exist in states which cause us to do many things. Expectations are relations to no-things which have real causal and shaping powers. (2016: 12–13)

The fact that we have such expectations is a clear indication that the world expresses a relational, semiotic logic. As Deleuze and Guattari said, and Heidegger before them, existence is not an inner experience, but the experience of being projected, towards the world, towards others, towards what is not yet. Thus, Wheeler gives the following, creative and outgoing, definition of life as the situation whereby we embrace newness and “arrive to become opened up to further, a lifetime’s, relations” (2016: 212).

If living organisms can engage with what is not yet, what is expected (see the incompleteness referred to by Copley/Deacon), it is because they are *not* determined by genes. Organisms are not machines that follow a blueprint, nor is their evolution the result of random exploration. Rather, organisms are living beings that creatively interpret a code. Thus genes do not mean anything until they are *read* by cells. If reading exists today in human culture (reading books, papers, screens), it is only because organisms have been doing something *like* reading for ages (Wheeler 2016: 195). To offer a semiotic/relational explanation (versus a substantialist one), each organism is the result of its specific way of reading code material (sign vehicles), given a certain set of conditions – just as a concert is the creative interpretation, *enactment* of a score by specific musicians who must at every moment of the performance make decisions. Life is a feed-back process where certain conditions, capacities, and environmental cues are blended into and by a self-organising creature. Wheeler speaks here of a cybernetic teleology at play in and across living systems (2016: 76) where past and present situations force us to adjust our future intended behaviour, where present and future expected situations make us re-evaluate our past (2016: 128).

Patterns of meaning are reproduced; current structures echo, are scaffolded upon ancient ones. Modern knowledge built itself on knowledge from the Middle ages, before that, Antiquity, the early humans, and beyond (Wheeler 2016: 87–88). Yet knowledge also deals mistakes, and mistakes too can grow. A (personal) example: anybody who has been watching the news in the past year knows that bogus claims grow, conspiracy theories lead to bigger ones, can become headlines and king-makers. The growth of knowledge also implies matter: structural repetitions in culture, reproduce patterns in living and non-living nature (Wheeler 2016: 148–149). It is not enough to say that nature and culture are linked (humans are part and parcel of nature); in addition, one must admit that nature and culture flow into each other. Thresholds aside, there is redundancy in the structures of anthroposemiosis that echoes those at play in biosemiosis (and even physiosesemiosis). The anthroposemiosis in work, study and creation, necessarily reproduces, in its unfurling structure, the natural world itself; there is a structural analogy between the inside (*Innenwelt*) and the outside (*Umwelt*), between the past and that which is coming, between nature and art. The world is full of habits; “where a system *has been* will influence where it is going” (Wheeler 2016: 73). In this case, there should be a structural continuity between the operations of: the eye, optic nerve, cerebral cortex, and brain stem; the function of icons and symbols; the history and theory of visual arts. Life definitely needs the structuring stability of habits. But when organisms are strictly habit-driven, writes Wheeler, “there comes repetition without difference, and one of the many kinds of death” (2016: 192). Wheeler may be thinking about cancer cells, stuck in repetition mode. Thus, for development and evolution to occur, life must also be creative, it must take risks and accept to make, and act on felt, abductive inferences.



Before moving on to the last part of this article, explaining how semiotics can be applied to reconsider nature-culture, I would like to react to a specific point in Wheeler's book.

*Expecting the earth* is not only a critique of what biological science was, and in many cases still is: i.e. deterministic and gene-obsessed. Wheeler also discusses artistic issues. According to Wheeler, in artistic creation "conscious thought may well be an impediment" (2016: 85); experience of creation is one of "nonconscious gestation and emergent illumination" (2016: 93); artists are attuned to unconscious life, awe, the sublime (2016: 178), they feel "a close acquaintance with the wisdom of attending to happenstance and the human body's coded and communicative but largely unworded life" (189). These are only a few instances of Wheeler's quasi-Romantic take on art which seems to inform her understanding of biology. This makes sense considering that Romantics (especially Germans, British, and Americans) were instrumental in combining art and natural sciences. As Wheeler insists on the virtues of "enchantment, incantation, creativity (not to mention the play of musement)" (2016: 199), we feel that her critique of mechanized biology, is also a critique of mechanised art. It is also analogous to her wariness concerning "too much technological interference in living processes" (Wheeler 2016: 123). In a way, Wheeler's book can be seen as a critique of what art has become in the last decades: ceding to technology, intellectualism, project management. Two points are worth mentioning. First, a Romantic return may not be possible – Wheeler hints at this in her reading of Simondon (2016: 220). I even wonder to what extent such a return is even desirable, considering that Romanticism was thoroughly Humanistic: the importance of nature rested on the experience humans could make of it. In addition, the typical Romantic idea of nature was one of pristine and unabused bioregions. Today however, it is probably more urgent to consider and confront the natural world co-created by its most world-forming inhabitants, humans. In my mind, the installations of Betty Beaumont, or the tissue art of SymbioticA, shed more light on human in / as nature, than the paintings of Caspar David Friedrich (as invaluable as these are) – and not just by *what* they represent but, more essentially, by the *manner* in which they do so. In any case, this appeal to Romanticism establishes a value to art and life – a value that is thoroughly ideological.

## Nature-Culture Semiotics

After reading these two books, I was struck by their similarities and differences. First, Copley and Wheeler both insist on the idea that a properly conducted study of human culture must take into account the natural sources of that culture. However, Wheeler has a Romantic perspective, where life and art are braided together; this is not an issue for Copley, who adopts a more programmatic tone, showing how biosemiotics could be effectively integrated in the cultural and social sciences. Copley's writing is linear and progressive, whereas Wheeler's writing gyrates, maybe enacting the redundancy that occurs in life. Bardini rightly says the book is "organized in a loop" (2017: 133). But these differences are somewhat superficial. To me, what crucially opposes Copley and Wheeler is an ideological commitment. Copley and Wheeler both argue in favour of the emergence of cultural phenomena from natural phenomena, yet in doing so, they are able to present contrasted views that are ultimately ideological; he insists on stability

and the structuring properties of constraints, she insists on creativity, the freedom of chance and abduction. I may be exaggerating this distinction; however, after reading these two books, I cannot see how biosemiotics will be above or shielded from ideology. It is precisely this hunch (felt guess? abduction?) that prompts me to reconsider what cultural biosemiotics can be.

Lack of space here prevents me from closely reading other important contributions to this question. But two should be mentioned: “Semiotic dimensions of human attitudes towards other animals: a case of zoological gardens” (Mäekivi and Maran 2016) and the multi-authored “How can the study of the humanities inform the study of biosemiotics” (Favareau et al. 2017). Mäekivi and Maran convincingly argue that human’s attitudes towards different animal species are conditioned by cultural and biological factors. Among the cultural factors, mythological (symbolic) meaning influences the value we humans give to animals. More importantly, from a biosemiotic perspective, our knowledge of, and feelings towards the biosemiotic relations those animals activate (and the extent to which these relations overlap with ours) also influence our valuation of non-human species. A similar application of biosemiotics is found in (Favareau et al. 2017). Being a multi-authored collection of texts, it is risky to draw general conclusions. However, two points could be singled out. An underlying assumption seems shared by many of the authors of this article, namely that biosemiotic relations inform anthroposemiotic relations. The question I am asking is: doesn’t this information go both ways? What does anthroposemiosis do with and to biosemiosis? The second point, is that knowledge of humanities can help biosemioticians be more creative (Kull’s appeal to poetry in life), it can help them appreciate the density of webs of meaning (Cobley’s statement that semiotics is the oxygen of biosemiotics). My question directly resonates with this: how can we creatively rethink what biosemiotics is about? How do other fields of inquiry that operate in the arts and humanities, that may or may not take into account biosemiotic theory, consider living systems, processes and structures?

To repeat a question I asked earlier: why are biosemiotic approaches to (human) culture typically bound to an ontological argument – “biosemiosis is a source, an origin for human cultural experiences” –, but tend to disengage when it is time to interpret the more problematic consequences of nature-culture expressions? It’s as if we were so eager to reset semiotics in the living world, that, in doing so, we radically dismissed problems of linguistic, political, symbolic nature. I would be tempted to call this a case of “throwing the baby out with the bathwater”. Notwithstanding John Deely’s (2001) enthusiastic prediction that the twenty-first century will be semiotic, we must admit that the twentieth century was also riddled with signs, meaning and interpretation. And even if it was mostly limited to a Post/Modern, human perspective, I cannot see how a century of intensely diverse scientific and cultural production could be simply cast aside.

Briefly put, I would say that biosemiotics is absolutely compelling in its *descriptions, explanations, interpretations of the various signs processes within living systems*. However, it is (generally) less interested by, or unfamiliar with the *interpretation of linguistic, symbolic, political appropriations of, and impacts on living systems* (whether those appropriations and impacts are its own, or whether they are found in other fields). And yet, we should be able to read Jakob von Uexküll’s famous monograph *A foray into the worlds of animals and humans* (2010) with his marginal yet absolutely riveting text, “Darwin and the English morality” (2013), where *Umwelt* theory is put to use.

Without following Uexküll's racist argument, I still think that his activism and his attempts to draw out symbolic or political consequences of his *Umweltforschung* are absolutely admirable. Equally compelling (and equally problematic) are two seminars given by Martin Heidegger, his well-known *Fundamental concepts of metaphysics. world, finitude, solitude. 1929–1930* (2008) and his lesser known *Nature, history, state. 1933–1934* (2013). Here Heidegger thinks world-forming (environment-building) capacities of humans *alongside* the creation of the nation-state: *polis* informs the *bios*.

Considering the intersection of life and (human, discursive, practical) culture, *does not mean* that we abandon what biosemiotics has been standing for since its inception (the study of signs and meaning in living systems) and devote ourselves entirely to discourse analysis. But since culture emerges from, and takes shape in nature, it is important to probe what culture does retroactively to nature (and not just through epigenetics). In other words, it is not enough to state that living systems are perfused with signs, that they develop and evolve with endo- and exo-semiotic cues, that developmental and evolutionary intention impacts living systems. We must also recognize and deal with the feedback cycle, the impact of human-cultural discourses and practices on those cues. In essence, human laws, policies and practices, serve to control, repress, and stimulate living systems in ways that can be as effective as natural selection. We could very well extend Foucault's (1997) insights on biopower to all, other-than-human living things. In my mind, this is something that biosemioticians could integrate in their research.

Take Uexküll's most famous example, the tick (2010: 44–53). Ticks are hematophagous ectoparasitic arachnids. A questing tick finds prey by detecting changes in humidity, heat, carbon dioxide levels, by feeling movement; the arachnid will let itself fall on the prey, insert its hypostome, and draw blood. Some ticks move from one prey to another, others hold fast on their host. Now, in this subjective biosemiotic account of the arachnid, human discursive and practical issues are obviously irrelevant. And yet, when local health organisations recommend spraying pesticides in at risks areas, to keep pressure on tick populations in order to prevent the expansion of Lyme disease, we must admit that human discourse and practice finds its way into the dynamics of that living system.

In the same way colonisation, resource extraction and species management are not, per se, parts of the *Umwelten* of the boreal woodland caribou (*Rangifer tarandus caribou*), a sedentary cervidae whose range spans widthwise across Canada. But in certain areas, these mammals are threatened, endangered or completely extinct due to human activities such as logging and mining (Environment and Climate Change in Canada 2017). Recently a small herd of caribou on the brink of extinction in northern Quebec has been making the headlines (Skene and Lewis 2017, Hope 2017). Business representatives, environmentalists and government officials are fighting over the territory that is both resource-rich and home to the herd. Obviously the caribou does not *know* this in the manner it *knows* how to find the reindeer lichen (*Cladonia rangiferina*) it thrives upon. Yet here again, human discourse and practise become a determining thread in the webs of meaning of the caribou. Biosemiosis is being impacted upon by anthroposemiosis.

Domestication of plants or animals is another example of the pressure human management has on nature. Take cattle, for example, descended from the now extinct

Auroch (*Bos primigenius*) (Francis 2015: 127–147). In a sense, humans *hijacked* the Auroch; we could say the same thing with rice, corn, pigs, chicken, cotton, wood, phosphorous, etc. When the non-domesticated (and dangerous) Auroch died off some 400 years ago, it had already been replaced by different breeds of domesticated (gentler) cattle, thousands of years in the making. The point I wish to make is that humans changed in order to keep up with their “creations”. The key here is the new symbiont: a human-cattle biopolitical organisation, determined as much by genetics as by agricultural techniques (and, in the last centuries, by techno-capitalism). This new symbiont is rigorously controlled and so is everything that surrounds it (fodder production, water management, use of antibiotics, fashions in meat consumption, etc.) We were making cows, but we were also making ourselves. To take up Uexküll’s (2010: 190) contrapuntal relation, we became cow-like and cows became human-like. Case in point: lactose had to be tolerated for dairy farming to expand, and the hegemony of breeds (Angus and Holstein) is determined by what the cows mean for us (meat and milk). The bizarre and myth-ridden case of the Heck neo-Auroch created in prewar Germany, dubbed the “Nazi super-cow”, is a revealing example of how humans shape living organisms according to their ideas, needs, desires, anxieties (as Heidegger would rightly say 2008: §§ 39–48, humans are *world-forming*), then they evolve within that world, are themselves informed by it. In this sense, doing a full cultural biosemiotics of domestication should not only involve studying the influence of other-than-human biosemiosis on humans (“humans adapted to the meaningful rhythms and patterns of the natural world”); it should also entail the study of human pressure on other-than-humans, the transformation of other-than-human experiences in the hands of humans.

Another particular issue that could be examined concerns reproductive rights. Sex, embryology and gestation, miscarriages, labour and delivery, oral contraceptives and drug-induced abortions, are sustained with biochemical signalling; these phenomena could very well be the object of quality core biosemiotic research. But as Margaret Atwood made it well known in *The handmaid’s tale* (1985) reproduction is not *only* an organic issue. In the United States, especially in the last year, reproduction makes no sense whatsoever without a cultural lens. In the month of January 2017, no less than 167 bills were introduced by legislators throughout the United States restricting abortions, from the presidential executive order banning US-funded NGO’s from offering abortion services and information, to Justin Humphrey’s House Bill 1441, that the Oklahoma representative justified by describing pregnant women as “hosts” (this particular one was introduced in February of 2017) (Redden 2017; Smith 2017; Valenti 2017; Wilson 2017). This is not a partisan issue, these are facts that must be dealt with and that have serious consequences for women who wish to organize their bodies and pregnancies (by any standards, 167 bills in one month restricting access to a specific aspect of healthcare is excessive). Debates surrounding reproductive rights activate a number of issues relating to gender (International Planned Parenthood Federation 2015), race (Dutton 2014), economic status (Sonfield et al. 2013), education (Dias et al. 2015). The question is: how could cultural biosemiotics contribute to this? Nature and culture are linked, biosemioticians know this. Human culture emerges from nature, Copley and Wheeler have clearly demonstrated this. But what is at stake with reproductive rights, is that the nature/culture relationship becomes fully bi-directional, fully dynamic. Indeed, laws that restrict access to abortion and abortion-related information –

or for that matter, laws that enable such access –, impact on living organisms. Laws thus find themselves fed into the Uexküllian feedback cycles of living systems. Discursive politics in-forms, through semiosis, organic reality.

As biosemioticians (I am including myself here), we could ask ourselves how we can foster constructive relations with others, attentive to the multiple social and cultural differences, conditions, situations, that shape our understanding of living systems – without falling into the trap of a “semiocentric bias”. We should learn to read with others (i.e. non-biosemioticians), grasp their insights, their languages, their stories. Hang around, so to speak, in the margins of biosemiotics, and engage in interdisciplinary dialogue. If biosemioticians are serious in their ambitions of naturalizing what they know of biological reality – i.e. that it expresses itself through embodied and situated recursivity, that it is mindful, processual, teleological, auto- and sympoietic – they must see how others are also getting this point across, through their own means. If biosemioticians wish to fully engage themselves in questions concerning nature-culture, they could address issues that emerge from the dynamic, reciprocal relation between biosemiosis and anthroposemiosis. A cultural turn in biosemiotics cannot leave core biosemiotics intact. Finally, it is not just a question of biosemioticians becoming fully engaged thinkers, embracing activism and interpreting/changing the world (though this could be commendable); rather, the point is that biosemioticians could put to profit their unique understanding of natural and cultural co-construction of living systems, in order to grasp how human discourses and actions impact on those living systems.

**Acknowledgements** This manuscript was written during the winter semester of 2017, while teaching a doctoral seminar entitled *Living Signs. Biosemiotics and Its Margins* at the Université du Québec à Montréal. For various reasons, principally linguistic and cultural, many of the students, who were all very well advanced and planning their dissertations, were engaging themselves with biosemiotics for the first time. Since the main subject of this seminar consisted in explicating living sign systems, we obviously read core and contemporary biosemiotic texts. And yet, considering the background of our program (arts and humanities), I thought it would be particularly relevant to also examine texts and issues outside of “proper” biosemiotics, but resolutely engaged with questions pertaining to signs, meaning and interpretation in relation to life – what I referred to as the *margins of biosemiotics*. We ended up doing something with and to biosemiotics that was not core practice, and rather different from what is currently being done under the heading of cultural biosemiotics. I wish to thank the students who participated in this wonderful seminar: Audrey Bélanger, Ivan Bricka, Lucile Crémier, Raphaëlle Dionne, Rana Hatmal, François David Prud’homme. I hope this seminar was as rewarding for them as much as it was for me.

I would also like to thank the reviewers of this journal who meticulously read through early drafts of this paper and whose comments helped me organise my thoughts.

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