

Culture, Politics and Biology from a Biosemiotic Perspective

Wendy Wheeler

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Résumé de l'article

Dans cet article je formulerai des considérations sur les implications que peut avoir l'interdiscipline émergente qu'est la biosémiotique sur la pensée politique (entendue au sens large). L'approche sémiologique associée à l'oeuvre de Ferdinand de Saussure est bien connue dans le contexte de l'analyse culturelle et politique. Or, sa faiblesse a toujours été, premièrement, d'avoir mis l'accent uniquement sur les usages humains langagiers et, deuxièmement, son incapacité corollaire à parler de biologie. Compte tenu du fait que l'esprit et le comportement humains sont des effets de systèmes biologiques, il s'agit là d'une omission considérable. La biosémiotique relie la culture et la nature et les intègre dans l'évolution des strates sémiotiques de systèmes récurrents biocybernétiques. Ce faisant, elle insiste sur le caractère ontologique et pratique de ce lien; de surcroît, elle insiste pour que ce lien soit reconnu dans les théories et pratiques politiques informées par la science.

Culture, Politics and Biology from a Biosemiotic Perspective

Wendy Wheeler

London Metropolitan University

*God guard me from those thoughts men think
In the mind alone; He that sings a lasting song
Thinks in a marrow-bone. – W.B. Yeats*

Introduction

Do you think that a society and a culture are first and foremost maintained simply by material objects and forces? Not so. For while these bearers of channels and codes (*i.e.* functions, or meanings) are very important, the most salient aspect of any and every form of living organisation is information and communication. Communication is seldom, of course, straightforward. It requires an informing context and, as a consequence, also interpretation. The life of any society is therefore dependent upon the flow of communication, or better, since this always involves context and interpretation, more accurately semiosis. Semiosis is the scaffold upon which the architecture of matter and energy of societies and cultures is built. The organisation of matter and energy, the building, the art and the technology, are the instantiation of a living plan whose theme is meaning. But this isn't only true of human-made forms of organisation. It is also true of organisms themselves and their internal (*Innenwelt*) and external (*Umwelt*) systems. The interdisciplinary which studies such systems and their interactions, conjoining the science of biology with the humanities subject semiotics, is biosemiotics.

In this article I shall offer some considerations on the implications for political thought (broadly conceived to include cultural studies, bioanthropology, and so on) of the relatively new interdisciplinary of bio-

semiotics (Favareau 2010).¹ The semiological analysis associated with the work of Ferdinand de Saussure is a now familiar part of cultural and political analysis, but its weakness has always been, first, its narrow focus on human uses of language alone, and, second, its related inability to talk about biology. Given the extent to which human mind and behaviour are an effect of biological systems (both as organisms and as part of ecological systems), this is a considerable omission. All living systems are communication and semiotic systems. The life of organisms is only possible to the extent that they are nested within and made, as lifeful and responsive parts of biocybernetic and bio-sociocultural ecologies, in the semiotic relations between individual organisms and their *Umwelten* (semiotic surrounds). Biosemiotics insists there is an ontological and practical link between both.

Damagingly, and as Walter Burkert noticed more than 20 years ago in his book on religion and biology, Saussurean influenced semiology, structuralism and poststructuralism all tended to exclude nature from cultural studies and sociology (Burkert 1996 : 2). Indeed, for a while it was claimed that 'nature' was merely an invention of culture, and that science, thus by frequent implication, was a fictional and ideological concoction. While developments in ecocriticism and the Environmental Humanities have largely reversed that trend, and while global warming and genetic modification have altered perceptions of the natural reality that is science's particular domain, Saussurean semiology still remains trapped in the nominalism and anti-realism of its founder (Sériot 2014 : 250). The Saussurean semiological system deployed by structuralism (which lost sight of Roman Jakobson's own organic structuralist sources in the developmental biology of the embryologist Karl Ernst von Baer [Sériot 2014; Wheeler 2016]) was, as it were, an attempt to move in the right direction, *i.e.* of signs. Saussure's nominalism, however, kept him, and subsequently his followers, tied to a conception of sign systems based wholly in abstractive human language and logos. But the latter forms only a tiny conscious sliver of human (and other organismic) semiotic activity; an evolutionary and realist thought about biology and nonhuman communication might have sent Saussurean interests in a different direction.

Natural and Cultural Meaning-Making

A biosemiotically informed view tends, rather, to adopt the semiotic philosophy of Charles Sanders Peirce (1839-1914). Although this may seem, to some biologists, an unnecessary philosophical complication of theoretical biology, in practice it makes possible a more detailed account of semiotic biological systems evolution on the basis of clues provided by developmental biology. This is because Peirce's own triadic semiotics, in which the sign consist in sign relations between an object, a representamen and an interpretant, firmly grounds the

sign object in body and world, and then also provides an essentially evolutionary account of how signs (and thus biosemiotic systems) can *grow*, or develop. In this way the evolution of signs and of organisms is tied to adaptation and system learning. This, in turn, makes possible the elaboration of this principle into a potential understanding of the biosemiotic emergence of complex semiotic systems (biological, socio-cultural and linguistic) from relatively simple ones (Wheeler 2016). Put at its barest (because, in fact, natural biological, cultural and linguistic systems depend upon the propagation of constraints, and evolutionary 'layers', for the maintenance and growth of patterns, meanings or functions [Deacon 2012]), complex relational meanings arise from the fact that interpretants can (and frequently do) act as new semiotically unexhausted objects, thus generating a potentially endless semiotic spiral (Deely 2001a). Of all those semiologists using Saussure, Roland Barthes, following Louis Hjelmslev, had some inkling of this generative capacity of signs via his concept of connotation. His interests, however, remained restricted to human cultures (Cobley 2015). Similarly, Gilles Deleuze and Félix Guattari, who were influenced by both Charles Peirce and Gregory Bateson, understood there to be a link between biology and the semiotics of language (Wheeler 2016), whose repeated patterns and forms they, too, tend to repeat.

The development of biosemiotics depends, in other words, on the equally important insight that the structural processes of cultures and societies proceed in a near identical fashion to those of natural systems. Indeed, when we ask where cultures and societies come from, how they arise and how take the forms that they do, a significant part of the answer can only logically be from nature. Both are evolutionary systems, and, since no thing comes from nothing, it follows that social and cultural forces and patterns take their lead and evolve from natural ones. Later I will suggest the principle underlying both. Perhaps needless to say, it is one noticed by all students of creative processes in science and culture (Bruner 1962; Ghiselin 2005), and by Gregory Bateson in regard to biological systems too. Human societies, like natural forms of self-organising feedback systems, turn on a mixture of chance and habit, context (*Umwelt*) and semiotic interpretation (Peirce 1992). And if the idea of interpretation, at least, seems odd in relation to non-human organisms, then we should note that, since at least the discovery of the form and function of DNA, the idea of codes and channels, interpretations, translations and editing has become an increasingly important part of the biologist's theoretical toolkit (Favareau 2010; Hoffmeyer 2008; Mazur 2015; Shapiro 2011; Wheeler 2016). The organism's semiotic co-evolution with and constant informational reliance on its environment (*Umwelt*, meaning semiotic environment) in terms of cybersemiotic feedback, which circulates ceaselessly between organism and environment, shaping both, has been well understood since the work of biologist Jakob von Uexküll in the early twentieth

century on the *Funktionskreis*, the earliest example of a cybernetic semiotic feedback loop (Uexküll 1957, 1982, 2001).

Here I want to address some of the potential implications of a *biosemiotic* way of thinking for the ways we frame political questions broadly. One very obvious implication is that a biosemiotic understanding of organisms, including humans, should have some significant effects concerning the ways we think about selves and societies and their cybernetic/cybersemiotic systemic entanglement and mutual influence (Brier 2008). For example, when we think about biosemiotic life, we will be aware of the extent, first, that our experience of reality is always mediated by signs and meanings (in Peircean terms, the relation between the triadic sign relation itself and the semiotic surround, or *Umwelt*), and, second, of the constant habits and adaptive adjustments that must characterise that systemic and evolutionary, both biosemiotic and also material relation. When we think deeply about this, it should become clear that self and mind arise from these relations. But this also means that we must begin to think about self and mind rather differently, as effects of a relational ontology rather than as phenomena based on something like ‘essences’. For example, a brain is not a mind but, as Jesper Hoffmeyer has put it, a tool for a semiotic body :

The mental is therefore not a uniquely human thing, either, but rather a general cognitive tendency or habit that doesn't exclusively reside in the brain, but can be observed in the workings of the most primitive organisms...Brains, of course, lend tremendously increased power to the cognitive regime of a species – but the brain in itself is just a tool for the semiotic body, not an independent organ of semiosis. There is no semiosis without a body, but plenty of semiosis without brains. (2015a)

Mind is, as Gregory Bateson has suggested, a ‘no-thing’, pure semiotic relation merely. For Bateson ‘Mind is empty; it is a no-thing. It exists only in its ideas, and these again are no-things’ (Bateson 2002 : 10). And, of course, that relation is not simply semiotic (in the human sense) but is biosemiotic. The material codes and channels which make it possible have evolved over a 3.8 billion year history, each one an emergent function of the wider relation between organism and *Umwelt*, and with each layer of biosemiosis recursively dependent on what went before it. This emergent informational system – semiosis within (*Innenwelt*) and without (*Umwelt*) – is the result of systems of semiotic relation, each evolving in their specific contexts and via their specific organismic interpretations of the genome. The latter, of course, is ‘read only’; but, as both Andreas Wagner and Kalevi Kull have separately pointed out, potential readings and meanings of the genome are manifold (Wagner 2014; Kull 1998).

Discussing the four inheritance systems elaborated by Eva Jablonka and colleagues (Jablonka *et al.* 1998), Kull writes :

In addition to this [*i.e.* the 4 inheritance systems], it is important to admit

the role of the environment. For instance, the pattern of behavior of organisms can vary depending on the environment in which these organisms live, which means that particular behavioral forms are connected (or limited) to a particular environment. Thus, for instance, what can be inherited via BIS [Behavioural Inheritance System] may be only the behavior used in concrete conditions, in cases where this environment holds. Therefore, the stability of environmental conditions is a necessary part of inheritance systems, being itself a carrier of a part of the information from generation to generation. As opposed to the genocentric view of biological evolution, the distinction between several independent inheritance systems makes it clear that GIS [Genetic Inheritance System] cannot explain all that is going on in evolution. Also, we should consider that the change or stability of the environment (i.e., the environmental information) is itself an obligatory component of inheritance. Changes in any of these inheritance systems may have evolutionary consequences. (Kull 1998)

This is a very specific reason for politicians to pay attention to environmental changes. These affect all ecological systems, not just humans, and changing the system and its interpretations as a result of attempts to adapt to radically altered conditions may have highly untoward 'creative' effects. Schumpeter's 'creative destruction' is ecological as well as economic.

Later Kull makes the point about evolution through cellular interpretation more strongly :

According to what we know for certain today, genetic memory in cells is read-only. It can be copied, but it is not possible for a cell to store any new messages in it. From this, it is conventionally concluded that only genetic changes, and not phenotypic modifications, have an importance for evolution. However, what the semiotic approach to organisms teaches us, is that the genome does not determine phenotype, but that the organism, in each stage of its development, interprets its genome when producing phenotype, and this interpretation can be shifted depending on the context of *Umwelt*. The genotype-phenotype interaction is not that of determination - it is interpretation. In other words, the DNA sequence does not specify many features of organisms. For instance, organisms with identical DNA may vary in gene expression, in their morphology and physiology, in behavior and language. Also, these differences can be inherited over several generations, even in if no changes in genotype occur. Emergence of new features in organisms can, therefore, appear due to the changes in any inheritance system or in the environment. (Kull 1998 : 199)

All these biosemiotic relations between organisms' *Innenwelten* and *Umwelten* are in constant cybernetic feedback loops which settle into habits (Peircean Thirdness) and are pushed into innovation by chance events and *Umwelt* change (Peircean Firstness) (Wheeler 2016).

Interestingly (when we consider the nature of invention and creativity), the motor of adaptation is not an algorithmic programme, as in AI computation, but lies in a tendency to take habits (patterns). With this we come to the underlying principle of development mentioned earlier. This pattern taking and repetition seems to be a marker of the

universe, of physics and of biology, more generally. However, in biological life, pattern is characterised by association (*i.e.* for a 'reader' – and this can be either another organism or an internal part thereof)² via similarity (and difference) (*i.e.* iconic signs) and contiguity (indexical signs). Humans call instances of such generative patterns metaphors and metonyms. Clearly, these arise from natural metaphors which precede the evolutionary development of humans.

Charles Sanders Peirce called this play of similarity (and difference) abduction – *i.e.* the generation of new forms and ideas by experimental play involving the movement of a pattern of organisation (including cognitive) from one 'location' (physical or ideational) to another on the basis of similarity of pattern and/or function. Bearing in mind that 'mind' is reducible neither to consciousness nor brain, Peter Harries-Jones puts it this way :

Abduction is conjecture and it changes the rules about inference-making, for abduction allows for analogy; it does not require the sequence of steps that are part of induction or deduction nor their strict methodologies to ensure verification. (2016 : 209)

Referring at first to deductive logic manifest in Barbara syllogisms (all men are mortal, Socrates is a man, Socrates is mortal), Gregory Bateson goes on to discuss the abductions, or natural metaphors, that he calls 'syllogisms in grass' :

it looks as though until 100,000 years ago, perhaps at most 1,000,000 years ago, there were no Barbara syllogisms in the world, and there were only Bateson's kind, and still the organisms got along all right. They managed to organize themselves in their embryology to have two eyes, one on each side of a nose. They managed to organize themselves in their evolution so there were shared predicates between the horse and the man, which zoologists today call homology. It becomes evident that metaphor is not just pretty poetry, it is not either good or bad logic, but is in fact the logic upon which the biological world has been built, the main characteristic and organizing glue of this world of mental process that I have been trying to sketch for you. (Bateson & Bateson 1988 : 28)

Thus we can argue that natural metaphor and metonym (and by extension 'narrative') is the logical precursor to human metaphor, metonym and narrative, and that each (in art and religion, as well as in subjective and cultural history) has a potentially adaptive function. As with all semiosis, meaning-making both bridges and reaches across biology and culture. It would be politically short-sighted to ignore either.

Nominalism is the doctrine that everything is simply mechanical and that universal qualities, such as relation, community, interpretation and love, and what we consider the virtues, are simply human fictions made up to cover a bleakly unknowable reality. On this view, humans (and other organisms) are simply mechanically determinate individuals. The difference between nominalist Saussurean semiology

and Peircean realist semiotics is that Peircean triads are directly ('intuitive awareness') or indirectly ('abstractive awareness') derived from embodied experience and grounded in the reality of environmental life as sign *relation* in an *Umwelt* – both natural and cultural. It is sign *relation* that makes objects thinkable and knowable at all in the first place :

Nominalists hold that reality comprises individuals. They deny that there are laws operative in the world and that there are kinds of things in nature apart from thought. On their view, a complete theory of the world could be given by enumerating individuals and their particular traits without the use of laws or general concepts, even if, as they allow, exhaustive knowledge of the world in its particularity is beyond the capacity of finite minds.

According to nominalists... immediate experience is a chaotic torrent of independent data that is organized by the mind to form a coherent view of reality. individuals given in experience are subsumed under general concepts on the basis of their similarities, and when individuals of one kind are found alongside individuals of another kind repeatedly, the association is formulated as a law. However, nominalists insist that the laws and general concepts used to order experience are neither given in experience nor objectively derivable from it. They point out that since any two things are both similar and different in limitless ways, talk of similarity is intelligible only for a given point of comparison... Nominalists hold, then, that the choice of a conceptual scheme is determined by knowers' interests rather than by objective features of the world. For them, talk of truth and falsity is possible only within a framework of laws and general concepts... [however] for nominalists, laws and general concepts are artefacts of economizing minds to which nothing in reality literally corresponds. (Forster 2011 : 4-5)

Peirce seems to have thought that nominalism was a mark of the modern mind in general, and also a doctrine of despair about human knowledge. It opened the door to the strong implication that humans are motivated by power interests alone. He believed that the reality of sign relations overcame it. In particular, he objected to its implications for the reality of science and for the real growth of knowledge as semiotic. Clearly, for Peirceans and biosemioticians, a relational ontology, and the patterns of the world this depends on, certainly does constitute reality, and it is a reality about which more can be known.

I shall discuss the distinction between 'intuitive' and 'abstractive' knowledge in what follows. The teaching of art and literature might most usefully find its way back to the ancient truth of embodiment as relation, the study of form and aesthetic pleasure in patterns of similarity and difference, habit and change. This requires a rejection of the bad faith involved in denying biological and evolutionary reality as a matter of patterns and interpretations (more of which in a moment), and it does not involve simplistic reductions to the gene-centric mechanical neo-Darwinism of the Modern Synthesis of nearly 80 years ago. Biology has moved on since then and is now in the process – through the development of fields such as biosemiotics – of discovering that life, both biological and socio-cultural, is a meaning-making and meaning-

requiring force of creativity and system learning. As the philosopher Paul Ricoeur has written, metaphor itself has what we might describe as a developmental and evolutionary core :

Can one not say that the strategy of language at work in metaphor consists in obliterating the logical and established frontiers of language, in order to bring to light new resemblances the previous classification kept us from seeing? In other words, the power of metaphor would be to break an old categorization, in order to establish new logical frontiers on the ruins of their forerunners. (Ricoeur 2003 : 233)

The Historical Problem of Semiotic Error, the Rise of Nominalism and the Misconception of There Being Neither Truth nor Reality

Unless interfered with by 'bad' signalling systems (poisons, viruses, bacteria, 'lies' of various biosemiotic kinds), bodies, and nonhuman organisms generally, don't have any problem with the truth. For bodies and nonhuman organisms, truth is of the pragmatic kind (hence Peirce's development of the philosophy of pragmatism, later renamed by him as *pragmaticism*). It is what works, what actually happens, and how an organism of that kind in that environment survives, reproduces and learns. Meaning, in other words, is tied to all of Aristotle's four causes : 1. efficient; 2. material; 3. formal; and 4. final. 1. intention (mainly not conscious and usually in the philosophical sense – the whole self and the whole *Umwelt* as system); 2. world (matter in *Umwelt*); 3. constraints; and 4. function and purpose.

Human meaning-making in symbolic abstraction, however, is different – as John Duns Scotus realised (Deely 2001b). This was a philosophical move that had extensive repercussions. Among these were the sixteenth-century Reformation which was born out of anxiety about the consequences of human semiotic fallibility and error (Adam's Fall being the prime motivating example), Descartes' philosophical scepticism and the search for an irrefutable basis for truth, and, finally, empirical testing as the basis for knowledge in the Baconian Scientific Revolution of the seventeenth century. Since this problem – which arose from the real distinction between what Duns Scotus (1266-1308) called human 'abstractive awareness', or knowing in consciousness and language, versus 'intuitive awareness' – is such an important point to grasp, it's worth quoting at length my own 2016 discussion of this matter in *Expecting the Earth : Life/Culture/Biosemiotics* (Wheeler 2016). My discussion there is centred around a quotation from John Deely's treatment of the distinction :

The insight about the nature of signs – that they are always involved in any kind of knowing – which starts with Augustine, and is explored further by many other philosopher-theologians including St. Thomas Aquinas, in fact undergoes a significant development with Duns Scotus when he makes clear the distinction between 'intuitive awareness' and 'abstractive awareness' (Deely 2001b : 376ff). Intuitive awareness is sensation; it is the awareness

that something – grass, a tree, a person, is just there, being what it is, like a pebble on a beach. This may give rise to iconic or indexical associations, but, as we must suppose that Scotus supposes, to nothing abstractive or symbolic. Abstractive awareness, on the other hand, is sensation but plus the added perception and understanding that makes something a semiotic object capable of symbolic development. As John Deely puts it, discussing Duns Scotus's distinction :

The semiotic import of this distinction drives from the sign-character of thought in just the manner Scotus calls attention to it. Intuitive cognition terminates in an object as acting on the senses here and now, that is, in the immediate surroundings of the physical environment. Recalling the Thomistic argument on the superfluosity of positing psychological states of a mental character [...] at the level of sensation, Poinsett is able to point out that sensation, as analytically prescinded and considered in its own right, is capable only of cognition as intuitive. [Think of an animal kind of knowing, or certain kinds of human knowing 'beneath' consciousness.] Perception and understanding, insofar as they are dependent upon and continuous with sensation, will by virtue of that continuity, also be capable of intuitive awareness or knowledge. But both perception and understanding will be capable not only of intuitive awareness but also of abstractive awareness. The reason is that the relations of the mind to the environment in the case of perception and understanding are sustained not only by the input of sense but also by the ideas or icons the mind itself forms as the basis for yet further cognitive relations to what is objectified [i.e. cognised as an object of awareness]. Perception and understanding achieve an awareness of an organism's surroundings not merely as things in the environment act upon organs of external sense but precisely as objects are correlates of perceptual images and conceptual ideas. [...] Hence in abstractive awareness illusion first becomes possible, and therewith error, both perceptual and intellectual. (2001b : 379-380)

In other words, Duns Scotus's distinction makes possible a development of the understanding of the sign which lays open the possibility of error on a scale unavailable to other organisms. This, in turn, and in the context of a theologically immersive world, is caught up in a much longer history of Augustinian pessimism about the effects of Adam's Fall. Duns Scotus's correct insight thus paves the way for William of Ockham (1287-1347) to say that the human use of signs, the human reading of the environment, is utterly unreliable. In fact, Ockham says that the human reading of more or less everything is so contaminated by Adam's defection that everything humans think about the world can only be a human fiction, something created by humans for human convenience. Here is the beginning of the problem that phenomenology will eventually try to answer, and, in the absence of a doctrine of signs, will fail to do so. The word for this meaninglessness of the human naming of things, in which reference is uncertain, flawed and prone to error, is, of course, nominalism. (Wheeler 2016 : 48-50)

In other words, sign use, *semiotics*, begins from an historical and evolutionary perspective in *biosemiotics*. All signs can 'lie' – a fact of which species make use in, for example, mimicry (Maran 2017). As

Peirce noted, in order to function as sources of meaning and guidance to the living, signs also require readers. The structure of the sign is open; it requires a living entity, whether organism or cell, to supply its meaning :

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; but the explanation of the phenomenon lies in the fact that the entire universe, – not merely the universe of existents, but all that wider universe, embracing the universe of existents as a part, the universe which we are all accustomed to refer to as ‘the truth’, – that all this universe is perfused with signs, if it is not composed exclusively of signs. (Peirce 1998 : 394)

So the sign is also that which can be *misread*. In essence, it is what an organism *does* with a sign which determines the former’s likely evolutionary success or failure. But success may well involve creative misreading. Although misreading may look like (and certainly can be) a weakness, in fact it is also probably one of the most significant reasons for life’s great creative adaptability. It is the cell’s possibility of making creative misreadings that accounts for nature’s phenomenal adaptability.

Without the possibility of the growth of signs via the structured (constrained, and not absolutely wild) production of a more developed sign, organisms would fall at the first hurdle of significant changes to their environments. Rigidity, unresponsiveness and being closed off to abductive (*i.e.* creative and often chancy and hunch-like) logic, is the enemy of creative growth. Signs and meanings require the constraints of habit in order to work, but too much constraint, too totalitarian an attempt at the control of signs and meanings, spells death. It follows as a corollary that organisms require the challenge of environmental diversity to grow in an optimum way. In what should be a warning for today’s ‘safe spacers’ and politically correct language and meaning controllers, experiments conducted more than 50 years ago indicated the mind-numbing and growth impoverishing outcomes associated with too much environmental limitation :

The isolation experiments have made it clear that an immobilized human being in a sensorially impoverished environment soon loses control of his mental functions. The daring and brilliant experiments inspired by Donald Hebb at McGill have shown the degree to which alertness depends on a constant regimen of dealing with environmental diversity. And as if this were not enough, we also know that the early challenges of problems to be mastered, of stresses to be overcome, are the preconditions of attaining some measure of our full potentiality as human beings. The child is father to the man in a manner that may be irreversibly one-directional, for to make up for a bland impoverishment of experience early in life may be too great an obstacle for most organisms. Indeed, recent work indicates that for at least one species, the utilitarian rat, too much gray homogeneity in infancy may produce chemical changes in the brain that seem to be associated with dullness. One wonders, then, about the issue of the appropriate exercise

of mind early in life as a condition for fullness later. (Bruner 1962 : 7)³

The genome is like a great library. As in an actual library, where many of the books encode similar and near identical facts of historical and cultural, philosophical and other insight, much information is repeated (Wagner 2014). This profligacy and promiscuity of nature produces many close enough repetitions, but the presence of similar alternatives acts as a failsafe device in which failure in one case can be met with substitutions in other cases. These substitutions may also carry the benefit of differences which allow new adaptive possibilities. Alert readers will notice, I hope, that we are in the realm of metaphor again : *i.e.* of a structured and also constrained process in which *similarities* allows substitution, and *differences* make newness and new directions possible (Wagner 2014; Wheeler 2016). In other words, the apparent failure of readings (due, perhaps, to *Umwelt* change), or indeed misreadings themselves, can also be creative.

In biological life, though, there is a general corrective to the problem of whether legibility failures are of the creative or the destructive kind. That corrective is death and, in the end, the evolutionary extinction of those species that develop bad habits of semiosis and resulting behaviour (*i.e.* interpretance).⁴ The biological level of things – the organic or ‘animal’ level that Scotus describes as using ‘intuitive awareness’ – is, in other words, equipped to deal with this problem. Abstractive awareness, especially where it becomes the dominant mode in which ‘reason’ is supposed to reside most effectively in human language, and where intuition is both discounted and, importantly, personalized as somehow internal rather than collectively vouchsafed and bestowed by the *Umwelt* as much as by the *Innenwelt*,⁵ however, presents life with a different level problem – that represented by nominalism. Martin Luther, Francis Bacon and René Descartes were all, unsurprisingly, nominalists.

That one very significant human response to this quandary should be the development of empirical science makes absolute sense. If we want to know whether something is true we should subject it, repeatedly to be certain, both to the most stringent tests of measurement and observation, and, most importantly, to collective agreement among the most suitably qualified group of humans that we can manage to assemble. (In the nineteenth century these will eventually come to be called scientists, or ‘knowers’). Unfortunately, and for all its considerable strengths, this ‘*Novum Organum*’ (or ‘New Tool’ for knowing) was unable to measure certain kinds of things such as minds, feelings, ideas, relations and many other qualitative human experiences. Because of an historical change in what counted as subjectivity and objectivity, modern science tended towards a nominalist position.

The distinction between so-called objectivity and so-called subjectivity that thus arose was not one that troubled the medieval

mind. The latter, in its more semiotically alert way, counted as objective the mind's grasping of the sign relation as such (triadic in the Peircean schema) regardless of its being mind-dependent or mind-independent. The sign relation still applied to both. Thus, as Deely has pointed out, the mediation of the world in triadic sign relations – whether in experience (intuitive awareness) or in language and thought (abstractive awareness) – is accomplished in precisely the selfsame manner, such that the supposed boundary between the world of nature (mind-independent, unaltered by what is known or not known by subjects) and human culture (both mind-independent artifacts and mind-dependent relations), is transcended. Deely notes that semiotic awareness begins with 'Augustine of Hippo's fourth-century proposal of *signum* as a general notion transcending the boundaries of nature and culture'. From here this awareness continues 'through the thirteenth-century realization in Roger Bacon's generation that concepts (both perceptual and intellectual) are signs formally' and is finally fully comprehended in the seventeenth century in 'John Poinot's demonstration of the irreducibly triadic character of sign relations'. This involves the understanding that 'the suprasubjective relational essence of sign as based on the singularity of relation as being indifferent to realization in awareness is precisely what explains how one and the same sign-relation can pass from awareness-independent to awareness-dependent being, and conversely, due solely to the circumstances of its terminus' (Deely 2015 : 267). Unfortunately, publishing his *Tractatus de Signis* in 1631, Poinot was already too late (Deely 2013). Nominalist doctrine had already seized the modern mind.

Prior to Peirce in the nineteenth century, the Portuguese monk John Poinot (also sometimes known as John of St. Thomas – see Umberto Eco 2014) had recognised that signs are composed of a triadic sign relation and are indifferent in structure and process to the nature/culture distinction and to the objective/subjective distinction also. This is why, in the absence of some form of grounding in widely agreed fact (whether scientific or phenomenologically close to universal, such as 'pain is bad'), sign relations can be a source of error :

Poinot would base his whole semiotic on what I would call the singularity of relation, 'singular' in constituting the only form or mode of '*ens reale*' that transcends the distinction between *ens reale* and *ens rationis*, and by that very transcendence (that 'singularity') makes possible within and among the physical interactions of 'real beings' in the universe what philosophers after Peirce will call semiosis – the action consequent upon the being proper to signs. (Deely 2015 : 269)

This is why fact is better ascertained in scientific method than in religion, and cannot be simply guaranteed by reference to individual reporting of feelings. This implicit demand for external or widespread collective validation (the reality of community) also explains why religions, and other claims made on the basis of individual experience,

will always claim converts and cohorts to affirm them. In any society based in scientific reasoning and method, the absence of widely confirmed empirical support will imply that the search for converts and cohorts of agreement must always be suspected of the desire to accrue social power rather than truth. While a convergence of interests and aims is necessary for the cohesion of social organisations, the political implications of the danger of collective error in *too much agreement*, and absence of dialogic exploration, should also be obvious. The reproduction of the *same*, and the failure to countenance disagreement, or *multifarious difference*, is clearly perilous because deathly. This fact is seen vividly in totalitarian societies which produce death symbolically and actually on vast scales.

The Growth of Selves : Constraint as the Care for Meanings

Indeed, the biosemiotic insight is that self in its fullness, including agency, in any organism, does not arise simply internally but is an effect of the semiotic *relation* between an organism and its *Umwelt* – including, of course, other organisms. Obviously, from a human point of view, self and agency will be very primitive affairs in many organisms, but that should not preclude the consideration that, however crude, this is what organisms, and even cells, are. As biologist James A. Shapiro writes of cells, for example :

Cells do not act blindly. We know from physiology and biochemistry and molecular biology that cells are full of receptors. They monitor what goes on outside. They monitor what goes on inside. And they're continually taking in that information and using it to adjust their actions, their biochemistry, their metabolism, the cell cycle, etc., so that things come out right. That's why I use the word cognitive to apply to cells, meaning they do things based on knowledge of what's happening around them and inside of them. Without that knowledge and the systems to use that knowledge they couldn't proliferate and survive as efficiently as they do. (Mazur 2015 : 15)

More accurately, we should say that the organismic self is an effect of the circulation of cybernetic information/semiosis (cybersemiotic)⁶ loops within, and recursively across, evolutionary levels. Just as the Fibonacci number series produces subsequent numbers (or layers when expressed in plants or limb sections, for instance) from within its own self-accruing mathematical movement, so organisms have evolved to accrue and internalise 'information' from their *Umwelten* in not dissimilar ways. All physical dissipative structures (vortices in water or air, for example) work and maintain their form by displacing energy, but life has evolved by tying the movement of matter and energy to the interpretation and movement (*i.e.* growth) of sign relations and meanings.

A key term here is *constraint*. Physical dissipative structures maintain form by the accident of constraints (boulders in rivers, or the meeting of hot and cool air) or as much by what is absent as by what is present. Living things develop over time and maintain form by

constraints on patterns, functions and meanings. These constraints close down certain meanings while leaving others open to development. Meanings, biologically, can be thought of as functions (the meaning of legs is 'walking'; the meaning of eyes is 'seeing'), but subsequent meanings remain possibilities.⁷ For example, painting or sculpture or music or reading etc. can come into being as new functions aiding better conceptual mapping. Similarly, 'seeing' makes a niche for the evolution, in concert with the development of metaphorical abstractive thinking, of 'knowing' ("I see") in, for example, writing fiction and philosophy. Indeed, Thomas A. Sebeok suggested that the development of articulated language in human beings did not arise for the primary purpose of communication, but, rather, for the primary purpose of a better secondary world-modelling system. Communication was on this view an exaptation (Cobley *et al.* 2011 : 5, 9n10, *et passim*).

We can also understand these layers of constraints, in which semiosis and meaning-making and meaning habit continue to circulate, in terms of Michael Polanyi's notion of tacit knowledge (Polanyi 1966). The tacitisation of knowing is an effect of what he called 'life's irreducible structure' (Polanyi 1968). It involves a movement from proximal to distal knowing and is, in the main, nonconscious. Where it is conscious, as in self-conscious learning in reading, riding a bike and so on, the movement of learning is expressed in the movement from conscious to more or less nonconscious knowing (although much of what is consciously learnt can be recalled, especially via association). Thereafter, any focus on what has become distal (or effectively nonconscious) will spell the ruin of the performance as in, for example, a focus on reading the words on the page rather than the meaning which somehow seems to lie behind or beyond them. Similarly, the successful riding of a bike, or even walking down a flight of stairs, depends upon *not* focusing on the mechanics of the act. Such constraint propagation, as a causal force depending on limitations placed on energy and information/semiosis, is also the topic of Terrence Deacon's *Incomplete Nature* (Deacon 2012; Hoffmeyer 2015b). There, Deacon notes that just as the invention of the number zero is necessary to the development of all advanced mathematics and physics, so what is not done, or not regarded, is an essential causal force in the presumed development of autopoietic living systems from dissipative physical ones.

However, it is important to recognise that, just as a fear of snakes and spiders appears in the behaviour of many animals, these sorts of behaviours (now seeming 'instinctive' – a word that probably should be banished as misleading) have, in fact, been learned by species from repeated experience, often long buried in the past. This indicates that memories are preserved in the constant nonconscious cybernetic circulation of signs across and between evolutionary and developmental layers. Cellular and system memory, and the very deep life of signs should not, therefore, ever be neglected. This has extensive ramifications

for a realist politics which wishes to approach the world as it is rather than as it might be preferred to be in a useful fiction. Attachments to cultural histories and place probably run very deep in biosemiotic life. Bridging the gap between such deeply experienced biosemiotic systems and semiocidal erasures of other and different stories will require a very particular consciousness of semiotic commitments.

Mind is a largely systemic phenomenon that arises from semiotic relational experience of enworlded body plus systems of associative record stored in environmental, bodily and cultural systems. In other words, the distinction between mind and body is false, and mind is as much an effect of semiotic relation between the whole *Innenwelt* and the whole *Umwelt* as it is of genetically inherited features – although the latter are certainly important. Genetic information can certainly exercise a strong influence, but nonetheless it still requires a calling forth by external conditions for full expression. Once this depth to biosemiotic being is fully recognised, then the idea that individuals can be made to change their minds easily through the presentation of rational arguments, or by public shaming or other threat, must necessarily have much less purchase.

As can hopefully be seen from the above, the development of a biosemiotic worldview has many political implications. These emerge not only through the most obvious ecological concerns of the field : that human subjectivity itself is forged in the meeting of genetic, epigenetic, behavioural and cultural layers of potential interpretation by the body's organismic systems, and that impoverishment of the *Umwelt* (semiotic environment) will lead, and already is leading, to impoverishment of human and nonhuman organic subjects and of their agentic developmental potential. Political implications emerge also in acknowledging the need for a grounding of truth in a world increasingly driven by information that is uncertain, contradicted or false. But this grounding in science requires also a shift in biological understanding from one based in an ontology of relationless objects to an ontology of semiotic relations (Wheeler 2016). In a world characterised by cybernetic, recursive information flows, it is important to understand that organismic life is similarly characterised too. It is by the rule of metaphor that the latter has generated the former.

Avoiding Semicide

It is with this thought that I want to close this essay with a brief reflection on the idea of semicide. This concept was proposed by the late Estonian semiotician Ivar Puura (Maran 2013; Puura 2013). All living systems are made of matter and energy, but the autopoietic organisation of organisms (and this is echoed in the cultural and social practices and institutions they produce) is dependent upon those structured processes of information which the molecular biologist and

biosemiotician Jesper Hoffmeyer termed 'semiotic scaffolding'. Puura's point, and it is an obvious one when you come to think about it, is that it is the destruction of this semiotic organisation that will presage the end of natural and cultural stories, and thus of the organisation of the matter and energy which bears and instantiates their codes and channels. Puura writes,

The diversity of nature is overwhelming. Every living creature, being part of a greater whole, carries in itself memories of billions of years of evolution and embodies its own long and still largely unknown story of origin. By wholesale replacement of primeval nature with artificial environments, it is not only nature in the biological sense that is lost. At the hands of humans, millions of stories with billions of relations and variations perish. The rich signscape of nature is replaced by something much poorer. It is not an exaggeration to call this process semicide. (Puura 2013 : 152)

There is a careful balance to be struck where semiotic spheres (human and also human/nonhuman) come into conflict. This kind of conflict is also recognisable between humans and between different societies – as Puura recognised. Taken to an extreme, both natural and cultural semicide are capable of physical forms of destruction. The only realistic solution lies in *equal* recognition of difference and of different stories, and, as humans, of the signsapes that have made us. Discussing Puura's ideas concerning the killing of semiotic voices natural and cultural, Timo Maran reminds us of arguments made by Juri Lotman also. Maran writes that semiosis is relation. Relation requires difference; relation with 'the same' cannot be productive. So while every animal and human 'gravitates towards the "reliable world of dearly loved landscapes and smells, familiar signs and relationships"... semiotics can teach us that we can thrive only in our relations with what is other and different' (Maran 2013 : 149).

In Lotman's hands, this is expressed in the observation that there can be no single 'pure' language in which truth is encoded. For the adequate modelling of the world at least two codes are required. Elaborating Lotman further, Kalevi Kull writes :

Initially, Lotman described this aspect as a necessary requirement for a semiotic system to have different types of coding, like conventional and representational, or symbolic and iconic, etc. For instance, he wrote : 'a message to be defined as "text" should be at least dually coded' ... and elsewhere, 'that semiotic dualism is the minimal form of organisation of a working semiotic system'... He also says, The idea of the possibility for a single ideal language to serve as an optimal mechanism for the representation of reality is illusion. [...] The idea of an optimal model, consisting of a single perfect universal language, is replaced by the image of a structure equipped with a minimum of two or, rather, by an open number of diverse languages, each of which is reciprocally dependent on the other, due to the incapacity of each to express the world independently. (2015 : 258)

In an interview that Kull cites within the same article, Lotman offers

another example :

When we are communicating, 'you' and 'I', we are interested, in a way, in maximum translatability. When I think, non-translatability becomes a useful factor. Let us assume – we create two ideal persons. They understand each other perfectly and fully, as we might imagine two identical bowling balls. What are they going to talk about? To talk, I do not need a perfect copy of myself, I need another person. I need a difficulty, since the difficulty means the creation of the new, a new thought. (2015 : 262-3)

For creative communication *and* new world-modelling of more developed signs, two codes at least are minimally required. This will involve both freedom and constraint. Igor Stravinsky famously wrote on this topic, 'Whatever diminishes constraint diminishes strength. The more constraints one imposes, the more one frees one's self of the chains that shackle the spirit (1970 : 65). Constraint and freedom are not opposites but complementary.

For the purposes of a discussion of political dialogue (or similar), we can call these codes the codes of expression-inscription (and their contexts) and the codes of expression-reception (and their contexts). We can see this at work in Stravinsky's recognition of this in the difference between the code he imposes upon himself, the *inscription*, and the code in which he will be able to express his *reception* of this code. These two are different. Each will involve the necessity of constraints, since every code, in order to be a code, must do this. In other words, there must be sufficient legibility to allow translation/interpretation. But somewhere in the meeting of these two codes Stravinsky will seek a *similarity* sufficient to allow the creative discovery of a *new difference* which *both links and distinguishes* them. Here we are not talking only about artistic or scientific or technological creativity, but also about the kind of creative dialogic growth of meanings which is possible *politically*.

What this means, in practice, in any human dialogic situation where the level of 'abstractive awareness' dominates, is that each participant must have grounds for having faith in the commitment to good intentions in the semiotic encoding of the other. These are real relations, not fictions. At the 'animal', nonconscious level of 'intuitive awareness', habit (sameness) will always tend productively to constrain chance in the discovery of new difference. But for humans, who must deal with 'abstractive awareness', there is not a single, but a double commitment. This commitment is to the true production of a shared world-modelling – the beginning and essence of community and of communion. It consists, first, in the commitment to good intention in encoding, and, second, in the commitment to good intention in decoding or, in other words, in the search for patterns in common, and a more developed sign. Where this double commitment is absent, we will know that we are dealing in a nominalist commitment to power and domination only.

Notes

- 1 The natural history of biosemiotics is provided in a detailed introductory essay by Donald Favareau (Favareau 2010). The International Society for Biosemiotic Studies was established in 2005, as was the journal *Biosemiotics*. The latter was published first by Nova Science and moved to Springer in 2008.
- 2 The semiotic capacity of *Innenwelt* organs and cellular organelles doubtless derives from their symbiotic origin as composed of once independently and separately living microorganisms. See Lynn Margulis's work in, for e.g. *The Symbiotic Planet* (1999). The multicellular biosemiotic life adopted by organs probably involves some form of quorum sensing of the sort observed among bacteria. See, for e.g. 'Bacterial Quorum-Sensing Network Architectures' (Ng & Bassler (2009).
- 3 See also Brown 2009. What is emphasised by both writers is not simply challenge alone but the perception and experience of relation.
- 4 The Peircean interpretant is not simply an 'interpretation' (although it can be), but is, as in the pragmatic maxim, the function or behaviour that is the effect (or sum total of all the effects) of the sign relation as it exists at any moment in time. The final interpretant would be the final sum total of all the effects of a fully developed or evolved sign relation.
- 5 The *Innenwelt* is a sort of potentiality of genetic expression and epigenetic and symbiotic activity – an 'expectation', as my 2016 book puts it, of the world yet to come. It is what Deleuze and Guattari mean by 'the body without organs'. See Wheeler 2016 : 11, 208 and *passim*.
- 6 See the work of Søren Brier in, for example, Brier, Søren (2008).
- 7 Similar ideas are articulated in the work of Gilles Deleuze and Félix Guattari, and also in Gilbert Simondon's information theory. Deleuze & Guattari were influenced by C.S. Peirce and by Gregory Bateson. See Wheeler 2016.

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Abstract

In this article I shall offer some considerations on the implications for political thought (broadly conceived) of the relatively new interdisciplinary of biosemiotics. The semiological analysis associated with the work of Ferdinand de Saussure is a now familiar part of cultural and political analysis, but its weakness has always been, first, its narrow focus on human uses of language alone, and, second, its related inability to talk about biology. Given the extent to which human mind and behaviour are an effect of biological systems, this is a considerable omission. Joining culture and nature as part of the evolution of semiotic layers in recursive biocybernetic systems, biosemiotics insists there is an ontological and practical link between both that should be part of scientifically informed political theory and policies.

Keywords : Semiotics; Biosemiotics; Bioanthropology; Biology; Gregory Bateson; Charles Sanders Peirce; Metaphor; Culture; Nature; Evolution; Information; Sens.

Résumé

Dans cet article je formulerai des considérations sur les implications que peut avoir l'interdiscipline émergente qu'est la biosémiotique sur la pensée politique (entendue au sens large). L'approche sémiologique associée à l'œuvre de Ferdinand de Saussure est bien connue dans le contexte de l'analyse culturelle et politique. Or, sa faiblesse a toujours été, premièrement, d'avoir mis l'accent uniquement sur les usages humains langagiers et, deuxièmement, son incapacité corollaire à parler de biologie. Compte tenu du fait que l'esprit et le comportement humains sont des effets de systèmes biologiques, il s'agit là d'une omission considérable. La biosémiotique relie la culture et la nature et les intègre dans l'évolution des strates sémiotiques de systèmes récurrents biocybernétiques. Ce faisant, elle insiste sur le caractère ontologique et pratique de ce lien; de surcroît, elle insiste pour que ce lien soit reconnu dans les théories et pratiques politiques informées par la science.

Mots-clés : Sémiotique; biosémiotique; bioanthropologie; biologie; Gregory

Bateson; Charles Sanders Peirce; métaphore; culture; nature; évolution; information; sens.

WENDY WHEELER PhD. is Professor Emeritus of English Literature and Cultural Inquiry at London Metropolitan University. She has been a Visiting Research Fellow and Professor at several universities in the UK, USA and Australia, and is the author of five books and more than 50 articles and chapters, especially on biosemiotics, nature and culture. Her latest book *Expecting the Earth: Life|Culture|Biosemiotics* was published by Lawrence & Wishart in 2016. She is currently working with biologists, biosemioticians and philosophers on a Royal Society of Edinburgh funded interdisciplinary research project – *Living Organisms and Their Choices* – at the Eidynd Research Centre, Department of Philosophy, at the University of Edinburgh.