

## Chapter 2

# Semiotics and Biosemiotics

Some of the cultural implications of biosemiotics are already inherent in semiotics. One of these is the ‘levelling of the playing field’ that semiotics effected. That is to say, in its interrogation of culture semiotics led the way in de-valorising *all* cultural artefacts, including those which have been said to have been born with, achieved or had greatness thrust upon them. Semiotics is a matter of understanding how sign systems – of all kinds – work. Originally, this endeavour was focused on culture: one of the key concepts of semiotics, invented concurrently by Roland Barthes (1977a) and Juri Lotman (1974) in the early 1960s, is ‘the text’ (Marrone 2014). Rather than a ‘work’, which indicates some higher purpose of an authorial genius, ‘the text’ indicates a fabric of devices designed through habitual sign use to reach a particular audience. Any collection of signs is a text and the concept was in the vanguard of the dismantling of the imaginary dividing line between so-called ‘high’ and popular culture. Thus, Literature (with a capital L) is still negotiating the cataclysm visited upon it by semiotics 50 years ago. For other fields and disciplines, semiotics has had similarly specific impacts. Linguistics, for example, has ceased to bury its head in the sand about ‘multimodality’. For the last 30 years, media and cultural studies embraced semiotics in the limited, but persistent, form of the ‘myth criticism’ that Barthes abandoned by 1971. Marketing and brand management has followed suit. Biology, perhaps, is currently bracing itself for the latest reorientation that semiotics affords. Most importantly, though, for the present argument, is semiotics’ part in the promotion of study across natural sign systems – including the cultural sign systems that are embedded in nature through the activities of humans.

That this massive, but simply stated, remit is sometimes difficult for the lay reader to grasp is a result of historical and institutional determinations as well as, perhaps, some of the anthropocentric bearings those determinations harbour. The term ‘semiotics’ is derived from a Greek root, *seme*, and was taken up by Charles Sanders Peirce, who sought to classify all types of signs in the universe. In this way, semiotics constitutes the major tradition of sign study ultimately derived from the ancient semioticians (see Sebeok 2001b). However, in Europe especially, it was the immense success and fashionable ascent of ‘semiology’ that initially brought the

possibility of broad sign study to the attention of the public and the academy in the latter half of the twentieth century. Semiology, of course, was inspired by the work of the Swiss linguist, Ferdinand de Saussure, whose *Cours de linguistique générale* (1916) predicted the growth of a general science of signs that might be possible if his principles were followed. In the latter part of the twentieth century, Saussure's call was taken up by semiologists (for example, Barthes 1973; Guiraud 1975) who confined their analyses to a limited range of cultural artefacts that might be susceptible to elucidation using broadly linguistic principles. Semiology prospered in Anglophone academia from the 1960s to the 1980s, gelling with the currency of (English) literary studies and sociology, as well as the popularity of Marxist politics.

Because of the centrality of textuality to semiotics after Lotman and Barthes, a current of thought which gained considerable traction in the humanities and the social sciences in the latter part of the twentieth century became erroneously associated with semiotics. This was the 'linguistic turn', inaugurated by Richard Rorty's 1967 influential collection, which coalesced various perspectives including those that later became prominent in Anglophone cultural studies. The idea that knowledge is 'constructed in discourse' with humans' apprehension of the world amounting to a mere figment induced by figures in language, arose out of the 'linguistic turn' and (post-)structuralism. As will be seen, the nominalism of the 'linguistic turn' is at odds with the Peircean realist perspective in biosemiotics. It also posits a definition of language based on 'figures of speech' and 'chatter' (see Chap. 3, below) rather than the more sophisticated cognitive perspective in biosemiotics offered by language as modelling.

The assumption, stemming from the linguistic turn, that much of human life was 'constructed in discourse' also underpinned efforts to conduct 'communicative praxis' (see Chap. 5, below). Barthes' programme of ideology critique launched in 1957 with his much translated work, *Mythologies*, provided an agenda for systematically analysing and rejecting the superstructural products of capitalism (Cobley 2015). The systematic aspect of Barthes' ideology critique derived from Saussure's separation of two sides of a linguistic sign into (a) a 'sound pattern' in the mind which represented sensory impressions of sound outside the mind; plus, (b) a 'concept' consisting of an abstract formulation of phenomena in the world such as 'house', 'white', 'see' and so forth (de Saussure 1983: 65ff., 101ff.). Saussure referred to these as *signifiant* and *signifié*, respectively, and the first principle regarding their connection that he emphasized was arbitrariness (1983: 67–70). Saussure's *Cours* was first translated into English in 1959 and *signifiant*, *signifié* and *signe* were rendered as 'signifier', 'signified' and 'sign'. The first item gave the impression to English natives that the *signifiant* was anything that did the work of signifying or, to put it another way, a sign – precisely the formulation that Saussure wanted to avoid. The term for the *signifié*, at the same, seemed to be anything that was the object of signification. At a stroke, Saussure's psychological conception of the sign was lost and versions of semiology were given free rein to look at all manner of cultural artefacts as if they embodied a *signifié/signifiant* relationship. The matter was compounded by the currency of Barthes' influential primer, *Elements of*

*Semiology*, translated into English in 1967. In order to enable semiology to be extended beyond linguistic signs, Barthes effected a slippage from Saussure, suggesting that “the signifier [*signifiant*] can, too, be relayed by a certain matter . . . the substance of the signifier is always material (sounds, objects, images)” (1967: 47). Barthes is not shy about the reasons for this un-Saussurean assertion: it was made so that the matter of all signs, including those in mixed systems, could be considered in the same way (1967: 47). Not only was there an encouragement to focus on those sign systems that were dominated by verbal modes, then, semiology also insisted that even nonverbal modes were susceptible to analysis based on the principles of Saussurean linguistics. In all cases, however, the sign systems to be analysed were human in origin.

Semiology therefore thrived in the humanities and, especially, along with ‘discourse study’, in established disciplines such as linguistics. It is this early institutional ascendancy of semiological principles which can often confuse the lay reader, along with the fact that the anthropocentric endeavours of semiologists were brought together with those of semioticians for the formation of the International Association for Semiotic Studies in 1969 (see Sebeok and Copley 2010) under the banner of ‘semiotics’. If semiology created the impression that the whole of sign study was human discourse and the human sign such that “All that is left is different forms and combinations of power and meaning games in a post-modern age” (Brier 2008b: 35), semiotics in the wider sense demonstrated something very different. The very localised study of the *linguistic* sign, a sign type used by humans alone, is only one component of the study of the sign in general. The human phenomenon of language is just one minuscule aspect of a broader *semiosis*, the action of signs throughout the universe no matter how they might be embodied. Put this way, language looks very small compared to the array of signs engendered by all interactions between living cells. Moreover, the issue of what is living is crucial: many semioticians of the major tradition, influenced by (Sebeok 2001c: 6), see *semiosis* as the “criterial attribute of life”. Sebeok, building on the work of his teacher, Charles Morris, as well as the sign theory of Peirce, carved out the study of non-human *semiosis* originally with his work in zoosemiotics (1963). Superseding this has been a fully-fledged biosemiotics in which it is recognized that not just a semiotics of human communication is needed, but, in addition to zoosemiotics, a semiotics of plants (‘phytosemiotics’), of fungi (‘mycosemiotics’) and of the 3.5 billion year old global prokaryotic communication network within and between different bacterial cells (‘microsemiotics, cytosemiotics’). Indeed, contemporary semiotics recognizes that the human, while s/he is a sapient user of signs, is not just a discursive entity: in fact, the human is a mass of signs enacting message transfer nonverbally within the body (‘endosemiosis’).

It was with the advent of zoosemiotics from 1963 and, then, especially biosemiotics, that semiotics became recognizable as a pre-Socratic enterprise seeking to unify science and philosophy. That is to say, semiotics’ concern became the operations of the entire cosmos – the Earth, its inhabitants and the elements – rather than just the interactions that constitute the polis. Both Peirce and Sebeok, out of step with the intellectual fashions of their times, shared this outlook. For the later Peirce,

especially, the entirety of logic, philosophy and science were only approachable through an expansive sign theory, as Poinot had demonstrated in 1632 (see Poinot 2013, Chap. 1, above, and this chapter, below). Peirce envisaged a sign theory that would be comprehensive rather than localised, comprising “mathematics, ethics, metaphysics, gravitation, thermodynamics, optics, chemistry, comparative anatomy, astronomy, psychology, phonetics, economics, the history of science, whist, men and women, wine, metrology” (Peirce 1966: 408). It did not defy logic when he wrote to Lady Welby, late in life, revealing that he had recognized ten basic types of signs and, as has been seen in Chap. 1, 59,049 different classes of signs in all (Peirce 1966: 407).

Whether signs covered the entirety of the universe of just humans’ activity, it is important to note that the history of sign theorizing from the ancient medics onwards was largely dominated by a binary distinction of *signans* (the vehicle which acted as sign) and *signatum* (that which was signified). A quasi-necessary consequence of this two-sided relationship is a ‘code’ perspective in which the ‘vehicle’ is an encoding of some content or ‘tenor’ (cf. Richards 1937 and this volume, Chap. 6, below). The high point of this binarism is to be found in Saussure’s *Cours*: the sound pattern (*signifiant*) and the concept (*signifié*).

Saussurean semiology is not principally concerned with how signs indicate or communicate about specific objects; instead, its focus is how regimes of communication, somewhat removed from specific objects, are sustained and perpetuated. This has been a productive perspective and has spawned much work that helped in decoding the familiar and the further reaches of culture. However, the key observation is that Saussurean semiology has largely served a conception of signification as communication. It has not fared so well as a means to explicate cognition, the relationship of communication and cognition, the broader world of signs and the *Umwelten* of sign users.

Whereas Saussure continued the tradition of the two-sided sign, Peirce broke with this line of thought and insisted on a triadic sign. The theoretical importance of this break should not be underestimated and it has been emphasized and discussed in the previous chapter; yet it was by no means without precedent. Its roots can be discovered in Peirce’s profound knowledge of not just classical logic but also of the Latin scholastic tradition. As with the technicalities of what was taken from Saussure’s *Cours*, it is important to consider the mechanics of sign-hood inherited from this tradition. The Latins took as part of their task the exegesis of the perspective on signs emanating from the teachings of St. Thomas Aquinas. The most important of these exegetes was the aforementioned John (sometimes ‘Jean’ or ‘Joao’) Poinot: his ‘*Tractatus de Signis*’ (2013 [1632]), nearly 60 years before Locke coined the term ‘semiotics’, offers a realist foregrounding of the sign as the object of study to illuminate the two key states: mind-dependent being (*ens rationis*) and mind-independent being (*ens reale*). Deely (1994: 11–22, cf. 2009a), the scholar who rescued Poinot from mere footnote status, demonstrates how Poinot defined an *object* as always an *object* of experience (an entity involving mind-dependence), definitionally distinct from a *thing* (a mind-independent entity). As was seen in Chap. 1, the latter may be made an *object* by the *thing* being experienced; but, even then, through the sensations it provokes, the feelings about them and its

consequence, that *thing* is never available ‘in full’ – it is only available through a *sign*. That the *sign* is simultaneously of the order of mind-independent *and* mind-dependent being and that it is triadic in constitution (‘Representamen’, an Object and an ‘Interpretant’) as Peirce theorized, is of great import for biosemiotics.

Biosemiotics and the Saussurean sign were not compatible, despite the attempts of individuals such as the Belgian biochemist, Marcel Florkin (1974), to unite them. Although it only became explicit a little later, Sebeok’s foundation of zoosemiotics proceeded from a broadly Peircean perspective on the sign. More importantly, from the late 1970s onwards, following his discovery of the 2nd German edition of the *Theoretical Biology* of Jakob von Uexküll in 1976, Sebeok began to develop semiotics (and biosemiotics) in Uexküll’s direction (see Sebeok 2001b). As has been discussed in Chap. 1 and will be revisited in Chap. 3, von Uexküll’s work, even when it is not mentioned, is integral to biosemiotics, particularly the formulation of *Umwelt*. Biosemiotics takes it as *read* that all species live in an ‘objective world’ that is constructed out of their own signs, the latter being the result of their own sign-making and receiving capacities. In relation to general semiotics, Peirce had already stated that “A sign, or *representamen*, is something which stands to somebody for something in some respect or capacity” (2.228). It is evident, then, that there is a fit between the sign in Peirce’s definition being *for* “somebody” (or some species member) and von Uexküll’s idea that any animal lives in a world where the signs it circulates are characteristic of its species and sensorium. Moreover, the notion of *Umwelt* maps nicely onto Deely’s Peircean formulation of thing/object/sign. Non-human animals, it should be clear, do trade in signs; however, they inhabit an objective world where their experience determines the character of what they apprehend.

Two consequences arise from these facts and should be noted here as a reminder of the features of biosemiotics that this book seeks to amplify. The first is that biosemiotics is not just a matter of explicating nature in terms of communicative signs. Instead, it charges itself with the task of understanding the ‘experience’ of signs that occurs in nature, how organisms ‘know’ the world and how the highest organisms have ‘cognition’. The second is that the non-human animal’s dwelling in an ‘objective world’ means that it cannot ponder the mind-independent being. While it is true that such animals can implement signs, unlike the human they do not know that there is such an entity as a sign which is susceptible of analysis (see Deely 2010). The animal with an *Umwelt* that facilitates such knowledge is the human. Yet, it is as well to be immediately clear that this does not entail that the human in biosemiotics is a fully autonomous entity, in a special category, divorced from nature. The human, with its recognition of signs and all its paraphernalia of culture which seems to depart at such length from the apparently lowly mechanical processes of nature, is part of a natural continuum. Indeed, the reason that the human does not depart from the mechanical processes of nature is that biosemiotics demonstrates that those processes are often actually far from mechanical. The cultural implication is that humans must be considered for their consanguinity with other living organisms whose operations, as will be discussed in Chap. 3, are less mechanical and more in tune with human semiosis than was thought before biosemiotics’ insistence on investigating how organisms ‘know’. Of course, at the same time it is worth considering that humans, because of the disjuncture of *Umwelten*, may not be in a position

to assess the import of non-human animal semiosis. As De Waal states (2016: 6) when pondering the injustice of the *scala naturae*, “It seems highly unfair to ask if a squirrel can count to ten if counting is not really what a squirrel’s life is about”. The point is not incommensurable with Deely’s formulation of the semiotic animal (cf. Colapietro 2016).

One way to approach what unifies biosemiotics, and to do so in a way which will reveal cultural implications, is to consider its objects, the key phenomena of its investigations. Kull (2007: 2) suggests the following list: recognition, memory, categorization, mimicry, learning and communication. Most of these would not be on the lay person’s list of attributes to note in the world of living non-humans. What they demonstrate, once more, is the perspective according to which biosemiotics elucidates the continuity of nature in considering what natural entities might be considered to ‘know’ through their implementation of signs.

*Communication* most clearly bears on what anthropocentric (pre-biosemiotic) discourse understands as the division between nature and culture. All organisms communicate in some way. The difference between what is human and non-human is not to be predicated on communication qua communication; rather the question bears on what is verbal and what is nonverbal. Communication has a role to play in what constitutes an agent and a subject and what putatively separates the individual from the collective.

*Learning* is often associated with the experiential process which humans undergo. It is commonly observed in the activities of young animals, for example those that spend their early months in ‘play’ as a prelude to hunting. Yet, learning needs to be considered in a new light. “Once alive”, writes Kull (2014a: 288) “organisms cannot avoid fulfilling their organic needs and, by doing so, they cannot completely avoid learning”. This is because “life is a more-or-less continuous problem-solving process” (2014a: 292). Learning separates the human and the non-human by degree and by quantity and has its role in subjectivity and agency as well as in distinguishing between nature and culture. Yet, as a semiotic process, stripped to a set of structural co-ordinates, it is clearly a continuous phenomenon necessitated by life.

*Mimicry* is a phenomenon in the natural world which, since Aristotle observed the chameleon, has seen its semiotic features neglected or underplayed. Maran (2007) re-dresses this and considers the role of mimicry in *Umwelten*. He identifies ‘abstract mimicry’ “where the object of imitation is a semiotic structure with such an intense or general meaning that its connection with a particular form has obtained secondary importance” (2007: 244). Where biology has tended to understand mimicry in terms of resemblance of animals, biosemiotics identifies the semiotic process. While, mimetic features are embodied, Maran points out that they are subject to semiotic rules, “where perception, resemblance, interpretation, messages, meanings, and their later consequences become decisive” (2007; 244). The signs of mimicry are obviously crucial in subjectivity and in belonging to a collective, as well as the purpose they serve for survival.

Following Lakoff and Johnson, Kull et al. (2008: 46) note that every living thing categorizes. Moreover, this opens the question of how distinctions are made by organisms and in organisms. These are considered to be part of “the wealth of scientific questions that have been left unanswered – primarily because they have been

left unasked – by the nonsemiotic life science” (2008: 46). Leaving aside the more nuanced descriptions, including those made by human animals in culture, what is harmful, what is beneficial and what is neutral or safe to ignore are central categories for the definition of culture as a ‘higher process’ as they are to the survival impulse of organisms other than human beings. Likewise, *memory* has served survival. Although commonly understood as a means to preserve and reproduce information, memory is a process imbricated with recognition, meaning and inheritance. So, Kull emphasizes that any semiotic system has its own memory. Moreover, organisms, as semiotic systems, co-exist with other organisms. Thus,

All living organisms demonstrate plasticity, i.e., acclimatization to the conditions that occur. The extent of the response is, of course, very different in different groups of organisms. The particular form of plastic response is often unique. Organisms are capable of adaptive response even if the situation is completely new (in the sense that the organism has never encountered such a situation in the whole history of life). If a response becomes a habit (or a conditioned response), i.e., if it is remembered, it is called learning. Habituation is almost as universal a feature as plasticity; it occurs in all organisms as long as they are alive. Habituation means that a solution, once found, will be found easier the next time; this facilitation in repetition is due to various mechanisms, together called memory. Consequently, learning (defined as plasticity plus habituation) can be one of the attributes of life. (Kull 2014b: 52)

For biology, memory is a matter of inheritance (epigenetic, neural, and social) but semiotic processes include memory processes in general (Kull et al. 2009: 172). This applies all the way down to the cell “where the relations between the signal received and the action followed can be related to the third – for instance to the lack or excess of something in the cell that can be regulated by the appropriate action” (Kull 2010: 51). For humans, there has commonly been a distinction between individual memory (indigenous to each person) and collective memory (usually sustained by cultural heritage devices). Yet, since as long ago as Bartlett (1932), that distinction has been shown to be misplaced. When considered as a semiotic process, memory’s domain and project is a key component in the networked relations of an *Umwelt*. This suggests that while material manifestations occur, it is a mistake to consider memory as solely a mental phenomenon of which the material is a representation. As Deacon (2012a: 424) notes, when discussing ‘constraints’, the changing distributions of electric charge in the memory registers of a computer are not the crucial elements so much as what is being transmitted.

Along with memory, *recognition* has been the process through which collectivities have been organized in culture, through which humans have been subjects and/or agents, the process by which humans have orientated themselves to others verbally or nonverbally and how both nature and culture and mind and matter have been separated. In biosemiotic terms, meaning is a unit of recognition because any organism that does something more than once is encountering meaning. Referring to Uexküll’s ‘functional cycle’, Kull (2004: 104) notes that “all behaviour of organisms, all functions of a living body, are expressions of circular acts which include recognition of signs by receptors, actions as induced by these recognitions, and perceptions of the results of these actions”. It hardly needs to be stated that ‘recognition’ in English signifies a ‘re-cognition’. What does need to be added,

however, is that recognition as a semiotic process, where distinction arises from reinvesting objects, is continuous across nature.

What has prevented recognition – as well as memory, categorization, mimicry, learning and communication – being assessed as processes, is the problem of their objects over different domains. This is the translation problem quoted in Chap. 1, above, that Hoffmeyer (1996: viii) identifies at the outset of *Signs and Meaning in the Universe* when he writes “How could natural history become cultural history?” When a lowly organism carries out a recognition, it seems so different in quality from when a higher organism enacts the same genre of process. In the latter instance, ‘meaning’ seems almost immeasurably heightened in comparison to the former instance. Ameliorating this difference, requires a train of thought to the effect that, as Hoffmeyer writes (1996: viii), “something become[s] ‘someone’”. While biosemiotics is regularly observed and commended for its exposure of semiotic processes across nature, it also presents an important implication for culture by offering the reminder that human practices of meaning (through recognition, memory, categorization, mimicry, learning and communication) are not exceptional.

The real problem that has prevented this implication from becoming a commonplace is that the translation of semiosis needs to be considered in different relations to time as well as in terms of the disparity of the realms of ontogenesis and phylogenesis. Consider the short period in which culture has existed on Earth and the rapidity with which it has developed. Then consider the evolution of flora. As Nöth writes, “Unlike in human or animal communication, where a sign can be produced rapidly and its purpose interpreted immediately, evolutionary plant semiosis is a phylogenetic process in which sign production occurs in the form of evolutionary selection” (2007: 147). There is, then, a major problem of translation between biosemiotics and cultural analysis in terms of the ontology of the object of both. Yet there is at least one other translational problem in relating the two areas.

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. As has been argued already, the human has often been taken as an absolute exception and the analysis of culture has perpetuated itself precisely through exceptionalism (cf. Harries-Jones 2016: 2). That is, apart from the occasional social Darwinist or vulgar determinist representations of the evolution of culture, humans and their practices have been seen as overwhelmingly ‘different in kind’ from all other life on the planet (see Chap. 3, below). This is not just a throwback to Biblical or other religious narratives in which the Earth is the centre of the universe. Indeed, the problem lies in the secularist ferments of the Renaissance, where humanism strived to provide an alternative to the human as subject of the church. The compromise between the two positions can be seen in the work of later humanists such as Mortimer Adler (1967) who want to avoid the ‘ghost in the machine’, homunculi or golems (Deacon 2012a) that are attendant on Platonic or Cartesian dualism but nevertheless insist that there is some kind of ‘leap’ in evolution or some special quality that eludes evolution and entails that humans are ‘different in kind’ from other animals. Even as humans became ‘naturalized’ in seventeenth-century Western science, became the object of empirical and quantita-



tive studies, Gaukroger (2016) argues that it was the ‘moral’ or human sciences which came to the fore and that “considerations of our relation to the natural realm now shape conceptions of the natural realm itself” (8). In the attendant ‘humanization’ of nature that was to underpin modern science, anatomy and religion, especially, were central players in “an aestheticized humanist conception of the aims and meanings of life” (309). 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 or a with conscious commitment to an explicitly humanist agenda. Nor is it necessary to compel even all semiotic analyses of culture to constantly reference an evolutionary framework. However, at moments of crisis, the humanist underpinnings of some theories of culture are exposed, along with their poverty (see Chap. 8, below). Such understandings of culture still have some way to travel before they can meet even biosemiotics’ more agent-friendly scientific approach to nature. It is for this reason that the present volume still argues for an anti-humanist perspective which, in spite of biosemiotics’ departure from mechanism and materialism, remains necessary in assessing culture.

Physicalist science’s prohibition of observations of agency in nature has been anathema to the humanities and arguably at the fundament of the ‘two cultures’ split (Snow 1959) or the ability to posit such a phenomenon. Biosemiotics has constituted a critical voice in this dimension of the sciences, identifying the restraining force of sterile scientism; for example, Hoffmeyer (2011: 191) has written about the counter-intuitive bent of “eliminativism” which denies “the reality of unlawfulness in the natural world, and thus of human free will”. Yet the maintenance of the ‘two cultures’ has been largely effected by the arts’ and humanities’ traditional refusal to translate from the sciences or to even engage with them. This refusal has promoted an isolationist position in which humans and culture are not just a special case but are simply unreachable by any form of science when a simple acknowledgement of nature as a continuum which includes cultural practices would effectively be the first step towards abolishing the separation between ‘the sciences’ and all the other disciplines. This acknowledgement is embedded in biosemiotics through its adherence to the synechism that was advocated by Peirce and it is a logical consequence of general semiotics’ focus on sign systems or semiosis rather than just the substrate of an individual sign. As discussed in Chap. 1, above, synechism is the principle of continuity; it is also associated with Peirce’s category of Thirdness, the realm of laws or, to put it another way, the ‘underlying phenomenon’ which seems, at first glance, not to be a substance itself. Peirce explains,

There is a famous saying of Parmenides {esti gar einai, méden d’ ouk einai}, “being is, and not-being is nothing.” This sounds plausible; yet synechism flatly denies it, declaring that being is a matter of more or less, so as to merge insensibly into nothing. How this can be appears when we consider that to say that a thing is is to say that in the upshot of intellectual progress it will attain a permanent status in the realm of ideas. Now, as no experiential question can be answered with absolute certainty, so we never can have reason to think that any given idea will either become unshakably established or be forever exploded. But to say that neither of these two events will come to pass definitively is to say that the object has an imperfect and qualified existence. Surely, no reader will suppose that this principle is

intended to apply only to some phenomena and not to others, – only, for instance, to the little province of matter and not to the rest of the great empire of ideas. Nor must it be understood only of phenomena to the exclusion of their underlying substrates. Synecism certainly has no concern with any incognizable; but it will not admit a sharp sundering of phenomena from substrates. That which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon (7.569).

The semiotic process, then, is what is at issue in nature's continuity rather than the physical being alone of any substrate. If the consequences of this for understanding culture have not been demonstrated sufficiently thus far, consider Peirce, once more, on the problem of matter and mind not as "two radically different substances but two empirically different aspects of the same substance" (Colapietro 1989: 89):

In view of the principle of continuity, the supreme guide in framing philosophical hypotheses, we must, under this theory, regard matter as mind whose habits have become fixed so as to lose the powers of forming them and losing them, while mind is to be regarded as a chemical genus of extreme complexity and instability. It has acquired in a remarkable degree a habit of taking and laying aside habits. The fundamental divergences from law must here be most extraordinarily high, although probably very far indeed from attaining any directly observable magnitude. But their effect is to cause the laws of mind to be themselves of so fluid a character as to simulate divergences from law. (6.101)

A Colapietro (1989: 89) observes, this is an idealistic position since it makes matter a species of mind, but it is simultaneously a materialistic position because it insists upon the embodiment of mind. Hopefully, without forcing the analogy inappropriately, it is possible to see here the necessity of comprehending nature's provenance of culture. Substrates in nature might be considered as habit fixations of mind, while the laws of mind that have produced culture (as well as nature) have featured divergences in cultural practices that are themselves of so fluid a character as to simulate divergences from law.

Arguments regarding human exceptionalism thus verge on the mystical, forgetting or denying that humans and culture are subject to any physical principles at all. Humanism, as poststructuralism and postmodernism recognized albeit in a limited and self-serving fashion, is predicated on the unwarranted assumption that humans are central in the cosmos. Anti-humanist – and sometimes 'posthumanist' – scholars have eschewed individualism and cultural vitalism, attempting to depict the human as *subject* to the structures that humans have often been instrumental in constructing (see Chap. 4, below). Semiotics' insistence on neutral analyses, focusing on the 'how' of sign systems, has also tended to evacuate human values from the phenomena under scrutiny. Biosemiotics, by seeming contrast, has been committed to exploring agency in signification, sharing insights into 'autonomy' with biophysical complex science (see Kauffman 2000; Neimark and Ake 2002). The temptation to over-emphasize free will in light of biosemiotics is, of course, to be avoided. The same kind of over-emphasis in culture has been responsible for the idea of 'art' as absolutely autonomous. It is also the way that the arts and humanities have insulated themselves from the much wider world which science investigates. Biosemiotics offers an entrée for a revolution in the understanding of culture; but the translation problem concerning the relative weights put on agency in culture and agency in nature will have to be negotiated carefully. Seeing beyond this, it is more

circumspect to identify an implication in the biosemiotic infusion of general semiotics that will be taken up in Chap. 4: that the human is constituted by nature.

Another word for the exceptionalism or the insistence on the complete autonomy of culture is ‘anthropocentrism’. Unsurprisingly, in anthropocentrism the specific qualities of the human are accepted as a discontinuity with nature, often suspending evolutionary thought altogether. The key quality in this case is the capacity for language; thus, the ‘linguistic turn’ and the idea of the world as ‘constructed in discourse’ add glottocentrism to the exceptionalist mix. Glottocentrism has served well as an institutionalized comfort zone, a prophylactic against the claims of continuity in nature. In contrast to semiotics, specialization has constituted a disciplinary self-perpetuation where the demand to be accurate about a very localized phenomenon inoculates against the need to recognize that phenomenon’s natural determinations. A particularly strange case of this is linguistics since 1945 which, on the one hand, has seemed to embrace its natural underpinnings with the advent of discussions about ‘universal grammar’ in the late 1950s and, on the other, has started to recognize in ‘multimodality’ that language cannot be isolated from other kinds of semiotic modelling. Yet, rather than pursuing these with a vigour that comes from unity of purpose, linguistics has split off into myriad schools which seldom if ever speak to each other. One result of this has been that ‘language’ has become the site of a free-for-all in which it has been co-opted to support conflicting glottocentric positions. As Hoffmeyer writes, “Ambiguous definitions of the differences between *words*, *sentences*, and *language* on the one hand, and *reference*, *meaning* and *understanding* on the other, has allowed too much room for metaphoric and misleading reasoning” (2008a: 281).

Biosemiotics has taken on the challenge of effecting change in science and, as such, is well aware of the problems of translation between the sciences and the humanities. The different imperatives in respect of the importance of agency in biosemiotics and the analysis of culture – the former seeks greater acknowledgment of agency while the latter is dogged by the problem of agency being overblown – is a relatively small impediment to recognizing the cultural implications of biosemiotics. Emerging approaches in environmental humanities, ecocriticism, ecophenomenology, cultural ecology, the study of embodiment, and posthumanism indicate a desire for the kind of revolution in understanding culture that biosemiotics so clearly and radically presages. The conflicts in institutionalised glottocentrism entail that some species-level issues concerning language which afford the potential benefits of a broader view remain off the agenda. In cynical institutional terms, this is understandable – if a discipline and its workers can become self-perpetuating and removed from what might be seen as the deleterious effects of other disciplines, there can be little surprise at the desire for maintenance when this is achieved. Yet, some of (bio) semiotics’ nearest neighbours – and, often, most institutionally powerful potential collaborators – in the study of significance have barricaded themselves against intruders by way of specialization and anthropocentrism.

Nevertheless, it is clear that biosemiotics does owe a great deal to the ‘old’ semiotics and that which it owes regards an important cultural implication. In sum, it is the dedication to interrogating all kinds of sign systems without bias towards one or

the other. For the semiotics of the post-Second World War period, this dedication finally overturned the hierarchy of 'high' and popular culture, a major landmark in the challenge to authority that was mounted across culture and social life, with varying degrees of success, in the last century. Yet, it is clear that either semiotics of this period was thinking too small or that the democratisation of culture that it entailed was only a short-term aim. Certainly, it is clear that the 'culture wars' that were ignited by the opening up of interpretation by semiotics were not unproblematic (Eco 1990; Dunant 1994). At the same time, the genie was out of the bottle, with semiotics' undermining of the bourgeois hierarchies of culture promising still something more. By 1971, Barthes was able to declare, in evaluating his *Mythologiques* 14 years after its publication in French, that "denunciation, demystification (demythification)" (1977b: 166) of the bourgeois and the petit bourgeois had become, itself, a mythological *doxa*. 'Mythoclasm' was to be succeeded by 'semioclasm', he claimed, a far-reaching interrogation of *all* sign systems and a *challenge* to their very basis. This would not simply entail unravelling the connection of denotation and connotation which sustained certain cultural hierarchies as 'natural', but a more thorough assault on the mechanics of meaning at the very level of the sign itself.

Barthes' call for *semioclasm* came shortly after the formation of the International Association for Semiotic Studies in 1969, where semioticians such as Thomas A. Sebeok broadened the entire agenda of sign study by encouraging its application to the whole of life. Barthes' subsequent 'retreat' into highly personalized writing, taken in this context, was not entirely without its political co-ordinates. However, the project of semiotics continues with the uncovering of sign processes throughout the living world. This is not just a matter of finding more objects for semiotics. Unsurprisingly, following the fashionable moment of semiotics in the West during the 1970s and early 1980s when semiotic analysis still had the flavour of magic, the commitment to semioclasm – even in hitherto unexplored realms for such analysis – seemed to some to be just more sterile analyses of different phenomena. In addition, it probably seemed to the casual observer that it reveals very little about humans and what impinges on them in the polis. Such a view, of course, constitutes a grave error. The implication for culture of biosemiotics' infusion into general semiotics is that analysis no longer promises to reveal simply what the messages that humans send are like: how they are constituted and structured. The commitment to considering semiosis as continuous across the realm of nature changes that imperative. If it seems that, in doing so, biosemiotics is treating immaterial phenomena, then this is not a problem for semiotics but a problem of physicalist science which, as Deacon (2012a: 23) indicates, does not deal with the content of a thought, the goal of an action or the conscious appreciation of an experience: "They aren't exactly anything physical, even though they depend on the material processes going on in brains". The same could be said for the human use of signs.

Semiotics, now casting its net to analyse sign systems in the whole of nature, is thus concerned with how humans operate amidst signs, what distinguishes their cognition and their being as endosemiotic phenomena among other organisms and in the cosmos. Put another way, all semiotics that eschews exceptionalism is biosemiotics; this, in turn, is semiotics. Answers to questions about human affairs, as will be seen in the next chapter, are sought in the interrogation of modelling.