

L'ouvrage

Le réseau « Chromatiques whiteheadiennes » a pour objectif premier de fédérer les recherches sur les différents aspects, nuances et implications de la pensée du philosophe et algébriste britannique Alfred North Whitehead (1861–1947). C'est dans ce cadre qu'ont été créés en 2002, à l'Université Paris I Panthéon Sorbonne, des séminaires de recherche sur la philosophie organique whiteheadienne. Ces séminaires en sont à leur quatrième année et le temps est mûr pour le lancement d'un *Annuaire de la philosophie en procès* qui rendra systématiquement publics les principaux résultats de ces travaux et offrira complémentairement des études critiques et des comptes rendus récents dans les domaines whiteheadiens et connexes.

Le public

La pensée de Whitehead est un prisme dans lequel chacun(e) peut trouver matière à penser. En effet, ses recherches portèrent d'abord sur les domaines logiques et mathématiques, puis sur la philosophie de l'éducation, l'épistémologie et la philosophie de la nature, et enfin sur la métaphysique et la théologie naturelle. L'édition inaugurale du *Chromatikon* offre un premier parcours de cet héritage chromatique.

Les éditeurs

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Annuaire de la philosophie en procès I Yearbook of Philosophy in Process I MICHEL WEBER ET DIANE D'EPREMESNIL

Chromatikon I

Annuaire de la philosophie en procès
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MICHEL WEBER
DIANE D'EPREMESNIL

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On Whitehead, Embodied Cognition and Biosemiotics

A Therapeutic Perspective

John Pickering, Warwick

1. Introduction

This article sketches the convergence of embodied cognition and biosemiotics, the study of natural signs. The thesis is that this convergence will help to bring about a therapeutic change in our experience of selfhood.

Human selfhood is being consciousness of existing as a particular individual at a particular time and place. In critical distinction from what we may suppose non-human consciousness to be, this depends on conceptual knowledge, some of which is relatively explicit and may easily be made conscious. Some, however, being habitual and implicit, may be difficult, or even impossible, to make the object of conscious awareness. However, if it is brought to consciousness, our sense of selfhood can change. This change can be both pathological and benign.

This article proposes that combining biosemiotics and embodied cognition in the spirit of Whitehead will help to make some of our habitual assumptions about selfhood more open to conscious inquiry. It is hoped that doing so will in turn help to bring about a benign change in the experience of human selfhood.

First, a brief account of embodied cognition is presented. Then, some resemblances between embodied cognition, biosemiotics and Whitehead's view of nature are noted. Next, it is shown how embodied cognition changes our image of selfhood and its place in nature. Finally, it will be shown why such a change is therapeutic.

2. Embodied Cognition is Organic

Psychology emerged in the late nineteenth century, when confidence in natural science was high. The mechanistic worldview of that time, and the reductive epistemology that it entailed, has had an enduring influence on the discipline. Indeed, until recently at least, it was among the last refuges of mechanistic reduction.

But the mind is not a mechanism. Mental life is an aspect of organic being. This, in Whitehead's view, encompassed the totality of nature. To attempt to abstract mental life from that totality by reducing it to « nothing but » a mechanism expresses what Midgley has called « reductive megalomania »

(Midgley, 1995). To do so may capture something of *how* mental life proceeds but it says virtually nothing about *why* it proceeds in the first place. As Dewey noted over a century ago, mechanistic reduction cannot account for the active, productive character of mental life ; it leaves psychology at an explanatory *impasse* (Dewey, 1896).

Recently, new lines of inquiry have opened up around this *impasse*. Embodied cognition is one of these lines. It is one of a number of attempts to « reclaim cognition » from the computational metaphor that has dominated psychology since the 1950's. Then, it was useful in helping psychology move on from behaviourism. Now, having outlived its usefulness, it is restrictive (e.g. Freeman and Nunez, 1999). Embodied cognition is the long overdue recognition that the body shapes the mind (Wilson, 2002). It is the theoretical re-orientation of cognitive science towards : « the creation, maintenance and transformation of the inner and outer states that allow us to know the world as an arena for embodied action ». (Clark, 1999, p. 350). As interpreted by Edelman, one goal of embodied cognition is : « to dispel the notion that the mind can be understood in the absence of biology » (Edelman, 1992, p. 211).

The embodied approach also dispels what Damasio has called « Descartes Error », which is mistakenly to take thinking rather than feeling to be the essence of mental life (Damasio, 1994). Correcting this error brings the attention of psychologists back to the fact that minds are active in the world and that conscious feeling is primordially attached to that activity. Moreover, this correction also makes clear that to deal with feelings fully requires phenomenological investigation rather than attempts to reductively explain them away. As William James put it when discussing the effort that accompanies recollection :

No mechanical cause can explain this process, nor can any analysis reduce it to lower terms or make its nature seem other than an ultimate *datum*, which, whether we rebel or not at its mysteriousness, must simply be taken for granted, if we are to psychologize at all. (James, 1890 : I, p. 2, *italic in the original*).

Feelings necessarily accompany the transactions that continually occur between active subjects and their surroundings. These transactions are the creative adjustment made by organisms to the objects they encounter and events in which they participate. This uniquely productive aspect of organic being cannot be captured in mechanistic terms. It requires a shift away from a mechanistic worldview and towards one that rests on organic interconnectivity and the creative advance nature. The rapid growth of embodied cognition is a sign that this shift is well underway.

The essence of embodied cognition is the recognition that mental life serves to engage with the world, not to represent it. This distinguishes it from the approach that has dominated studies of perception, memory, thought

and attention for the past five decades or so. This approach, which will here be called « Cognitivism », treats the nervous system as if it held representations of the world on which are carried out information processing functions similar, perhaps even identical, to those carried out by computers. By operating on internal representations of the external world these functions provide the basis for intelligent action. There being a formal theory of computation in which these functions may be expressed, it is clear that theories in cognitivism can be made more explicit and clear than before. Equally clear, though, is an implicit message : mental life is essentially formal and mechanistic.

One of the strengths of cognitivism was that psychological theories could be framed with far less ambiguity than hitherto. There was certainly less need for a specialised conceptual vocabulary such as that required by more discursive approaches like psychoanalysis or gestalt psychology. Theories of mental life were often formally expressed in programming languages. This led to claims that not only was there an external language in which human beings communicate with each other, but also an internal one in which they communicate with themselves. This « language of thought » was proposed as the medium for mental life and the vehicle of experience (Fodor, 1975). Thus the essence of human mental life was language.

Now language, and symbolic ability more broadly, are, of course, central to the human condition. They make it possible to form mental representations and to externalise them in the form of words and pictures. But considered phylogenetically, this ability is a very misleading exception. The capacity to represent the world, crucial to what it is to have a human mind, has been mistaken for what it is to have any sort of mind at all.

This is another consequence of Descartes' Error, arising from the implicit anthropocentrism of the *cogito*. Descartes pointed out that people cannot doubt that they have experience. Indeed not, but this is only so because they are able to represent themselves to themselves and hence can make experience itself an object of consciousness. But animals and young human beings who cannot do this nonetheless surely have experiences, even if their experience is not of the same order as that of human adults. How could it be otherwise, given the overwhelming evidence for continuity between human and non-human life? It seems reasonable to believe that there is something that it's like to be another species or a baby, even if adult human beings cannot know it directly (Nagel, 1979). Non- or pre-human experience may well be significantly different from human experience, but it is experience nonetheless.

Animals probably act adaptively without representing the world around them, or themselves in relation to it. Perceiving directly what the immediate-

ly perceptible world affords serves to guide action directly, perhaps with the addition of affective cues which motivate and distinguish different courses of action. The presentation is enough, representation is superfluous.

This helps to move on from what Hurley has called the traditional « input-output picture » of mental life (Hurley, 1998, p. 1). This is the idea that the mind is some middle ground interposed between the perception of the world and the action towards it. Hurley points out that action and perception are mutually constitutive and comprise the locus of the human subject. Activity at this locus serves to initiate and guide what human beings will do in a given situation. There is thus no need to propose an additional level of internal representations to link them.

Again, there is common ground with Dewey here. He too objected to the reification of experience as internal mental events. As he put it :

The living, behaving, knowing organism is present. To add a 'mind' to him is to try and double him up. It is double-talk; and double-talk doubles no facts." (Dewey and Bentley, 1973, p. 141).

In the human case, language permits the construction of internal representations and their externalisation in various forms. However, in terms of both evolution and development, this is *post hoc*. Embodied action, not language, is both the ontogenetic and phylogenetic origin of mental life. Language and mental representations are neither phylogenetically typical nor developmentally fundamental.

This proposition, that experience does not require representation, is central to embodied cognition, which opposes the implicit anthropocentrism of the *cogito*. It also repairs the reductive *faux pas* of cognitivism. To impose the abstract uniformities of computation and language on the diversity of natural cognition is a clear case of what Whitehead called « fallacy of misplaced concreteness » (Whitehead, 1929, p. 66). This is to take the regularities abstracted from reality by natural science for reality itself. The fallacy in the present case is to mistake the mechanisms of computation and the formal structures of language for the fundamental nature of living mental activity. As Kauffman and Goodwin put it :

Organisms live their lives, they don't compute them (Goodwin, 1999, p. 231).

This can serve as a motto for embodied cognition. It signals a shift away from the abstraction of the computational metaphor. It eases psychology through the *impasse* of mechanistic metaphysics and on towards the more biologically realistic project of creating a natural history of the mind. The purpose of such a natural history is systematically to survey the diverse forms of mind found in nature and to relate them to the complementary forms of life which are their vehicles. Interpreted in the spirit of Whitehead, Bergson and Piaget, the assimilative activities of these forms of life and

mind, taken together, are what energises and directs evolutionary change, the creative advance of nature.

Thus, with the emergence of embodied cognition, psychology is beginning to address the *why* of mental life as well as the *how*. The promise of embodied cognition is that it will allow us better to understand the mutually evolving patterns of interaction within the system of which both organisms and environments are parts. These patterns are guided by the feelings that are intrinsic to being Dewey's « living, behaving, knowing organism ».

3. Knowing is doing, doing is knowing

Behaving and knowing organisms are also the concerns of both the autopoietic theory of Maturana and Varela (Maturana and Varela, 1992) and the dynamic systems approach to mental life (e.g. Kelso, 1997). Indeed, Clark strongly identifies the latter with the project of embodied cognition (Clark, 1999, p. 348).

Embodied cognition helps to ease the restrictions that cognitivism imposed on psychology. By modeling itself too closely on the natural sciences, cognitivism expressed the reductive ethos that psychology inherited from the nineteenth century. This unbalanced psychology by its decontextualised treatment of mental life, tipping it too far towards the effort to discover formal laws that were assumed to lie beneath the surface of mental life.

Cognition cannot be properly investigated in this way. Mental life is the result of the dialectic of nature; it is at one and the same time both a product of and a participant in evolution. Thus, in order to investigate the mind adequately, psychology has to treat it dialectically. As Edelman puts it :

There must be ways to put the mind back into nature that are concordant with how it got there in the first place. (Edelman, 1992, p.15).

Embodied cognition is just such a way. It serves to rebalance psychology with a dialectical treatment of mental life. It is characterised by what Wheeler and Clark call « causal spread » (Wheeler and Clark, 1999, p. 106). That is, the causes of action are not sought in formal particulars within the organism alone. Instead, there is more even-handed attention to the dynamic interactions within a larger whole of which both organisms and environments are parts. This larger whole is a system that includes both what is inside an organism, what it outside it and the history of interaction that dialectically creates a relationship between the two.

This distaste for making firm distinctions between organism and environment contrasts strongly with the cognitivist assumption that the functions and internal representations thought to underlie intelligent action could be formalised in a context-independent language. By contrast, the theories of

autopoiesis, dynamic systems and embodied cognition all emphasise context-dependency and avoid drawing sharp boundaries between organisms and their environments (Oyama, 2001).

In any case drawing such boundaries is impossible. Organisms and environments are mutually evolved. Their structures are complementary. What an organism knows, and how it uses what it knows in what it does, cannot be usefully abstracted away from the history of how it inhabits the niche to which it is adapted. That history produces what Maturana and Varela call « structural coupling » (Maturana & Varela, 1992, p. 75). This renders the internal functional architecture of an organism a reflection, although not a representation, of the world towards which it is adapted to act. Cognition, thus, cannot be treated just in terms of what may be inside the head but something that actively relates what is inside the head to what is outside it. Both the internal structure of the mind and the external structure of the world must figure in any complete psychological theory. As an advocate of Gibson's ecological theory put it :

Don't ask what's inside your head, ask what your head's inside of (Mace, 1977).

Now, as embodied cognition takes hold, psychological inquiry may proceed at a more ecologically realistic grain. Theories based on causal spread take intelligent action to depend both on what the environment provides as well as what the organism makes of it. Knowledge is not just expressed in activity but is activity itself. As Maturana and Varela put it :

All knowing is doing and all doing is knowing (Maturana and Varela, 1992, p. 27).

In conflating action and knowing, embodied cognition takes psychology around the *impasse* of mechanistic reduction. Although the replacement of Behaviourism by Cognitivism is often presented in histories of psychology as an example of a paradigm shift, the continuity between them is clear (Valsiner, 1991). Both used mechanistic metaphors for mental life and both, in their rigid adherence to the reductive ethos of the natural sciences, reflected psychology's struggle for status in an academic world dominated by the natural sciences (Pickering, 2000).

But psychology is now recognised as a major science, albeit an atypical one. Ideas and practices from many disciplines are blended in it, reflecting the pluralism of the postmodern turn (Gergen, 1992, 2001). This has freed psychologists from the straightjacket of conceptual and methodological uniformity. That being so, the discipline has the potential, and even the obligation, to make a distinctive contribution to the major problems which presently face people, both individually and collectively. These have to do with the ecological impact of globalisation and the effects it produces in the therapeutic arena.

These matters will be discussed in the concluding section of this article. First, we will briefly note some common ground between recent work in biosemiotics and Whitehead's remarks on embodiment in chapters 7 and 8 of *Modes of Thought*. This common ground has to do with meaning and intentionality.

4. Biosemiotics is the Embodiment of Meaning and Aim

From Brentano to the present day, phenomenological writing has emphasised that consciousness is intentional. That is, it is *primordially about* something. But this *aboutness* is not neutral. It is intrinsically concerned with what Whitehead called *aim*, the extension of the present interests of an organism into the future. Meaning likewise, it is not neutral. It presupposes a conscious being that has an aim based on value. The notions of aim and value are occasionally taken as restricted to living rather than a non-living part of nature. Whitehead, however, avoided making a strong distinction between living and non-living. For him, « aim » was intrinsic to nature, which he took to be living at all levels. He regarded the « ultimate constituents » of nature as subjects rather than objects. In as much as ultimate constituents can be abstracted out of a causally indivisible whole, they are occasions of experience rather than substances (Whitehead, 1938, p. 229).

In line with the caution about making too sharp a distinction between organism and environment, we also need to avoid making too firm a distinction between living and non-living. Contemporary research in artificial life, genetics and evolutionary theory brings this distinction into question. The discovery of the thermodynamic principles underlying dissipative systems and demonstrations of quantum entanglement have taken us beyond the mechanistic metaphysics of the nineteenth century. Our new conceptual framework offers a dynamic ontology of interconnectivity and self-organisation. This change to our scientific worldview was anticipated by Whitehead when he predicted that biology rather than physics would prove to be the more general of the sciences. We are beginning to understand that organic action, and consciousness with it, is not limited to what are conventionally recognised as living systems. In Whitehead's metaphysics nature is a web of organic transactions between mutually evolved organisms.

The significance of this metaphysical surmise for psychology is that it redresses the over-emphasis on internal cognitive mechanisms. Like embodied cognition, it helps return attention to the body. Whitehead repeatedly points to the role of the body and its capacity for feeling. This both generates aim and ensures the continuity of consciousness (Whitehead, 1938, pp. 217-221).

He also points out the difficulty, even the futility, of making a clear and stable distinction between the organism and the environment. In his view :

There is no definite boundary to determine where the body begins and external nature ends (p. 221).

But this leaves us with the conundrum of how there can be interactions between organic subjects within a system within which there are no boundaries across which those interactions can occur. Now, here we can turn to biosemiotics, and especially the work of Hoffmeyer (1993) which extends the pioneering work of C.S. Peirce (Peirce, 1906/1991). European traditions of semiotics deriving from Saussure primarily concern the conventional signs of the human cultural *milieu*. Peirce, however, claimed that no clear boundary can be drawn between natural and conventional signs. Hence, biosemiotics enlarges the semiosphere to include natural signs that mediate the interactions between animals, plants and their surroundings (e.g. Sebeok and Umiker-Sebeok, 1992).

Peirce proposed that such signs are organic transactions concerned with information and meaning. They are examples of formal causation, a somewhat neglected member of Aristotle's typology of causes. Rather than the material and efficient causes that have been the principal concern of science for the past four centuries or so, formal causation depends on the flow of information rather than energy or mechanical force. In evolutionary terms, formal causation is what recruits matter, energy and information into evolving patterns of organic interaction. Within these patterns structured effects are produced by correspondingly structured causes. This form of causation is more than the linear transmission of force or energy. It is the non-linear, cyclic self-production found in systems which preserve their structure by preserving information. Although physical laws are not broken within such systems, they are nonetheless secondary abstractions. The contribution of Peirce was to recognise that beyond these secondary abstractions lay primary causes which are, essentially, semiotic.

Although not concerned with semiotics, Whitehead also saw physical laws as secondary abstractions from the causal texture of nature. That texture cannot be captured in static particulars or even in laws that describe how things change. Merely measuring the state of a system at a particular point in space and time and then inducing laws and regularities, is to miss fundamental aspects of reality. Indeed, for Whitehead there is no reality at an instant. The fallacy of misplaced concreteness is to believe that there is and to take nature to be, essentially, inert particles of matter that are only externally related.

This mechanistic approach made life and lived experience something secondary, even alien. Like Bergson and William James, Whitehead, found this

inimical. He agreed with Bergson that although technological achievements show that this approach is reliable, they do not mean that it is ontologically significant. In Whitehead's ontology, feeling is the fundamental fabric of reality. That is, the ultimate constituents of nature are subjects, not objects, whose actions are guided by feelings. Thus, experience is the primary feature of nature, which Whitehead took to be an organic process made up of evolving patterns of relationships between subjects. The creative advance of nature depends on action taken by these subjects in the service of feelings. These feelings are not confined to those which human beings are able to observe and describe. They are present at every level of nature, from organisms to atoms. In this metaphysical framework nature takes on an organic character. As he put it :

Biology is the study of large organisms, physics is the study of smaller ones (Whitehead, 1929, p. 125).

Likewise, Peirce's semiotic approach to causality is organic. He holds that there are no brute, objective facts of nature. The world means nothing until interpreted by a subject. This interpretation is very close to what Whitehead calls prehension. It is not a human monopoly akin to the conscious interpretation of signs however :

Thought is not necessarily connected with a brain. It appears in the work of bees, of crystals, and throughout the purely physical world. Not only is thought in the organic world, but it develops there (Peirce, 1906, p. 95).

This is not to say that bees and crystals think in anything like the way that human beings think. It is to say, though, that thought does not come into existence with the human condition. It is graduated and is prefigured in the operations of the pre-human and the pre-organic world. Indeed Whitehead held that there is no pre-organic world. To believe that there was would be to insert an unnecessary boundary in the causal continuity of nature. Peirce and Whitehead both avoided this by proposing that meaning and aim, which are essentially semiotic matters, are present at all levels of the natural order. Accepting this, boundaries dissolve.

This semiotic approach can be found in other disciplines than psychology. In physics it is the means by which David Bohm dissolves conventional boundaries to reveal what he calls « the unbroken wholeness of nature » (Bohm and Hiley, 1993, pp. 381-8). Bohm takes this wholeness to reflect the causal continuity of nature. Causation, whether physical or mental, inorganic or organic, the distinctions dissolve, is a matter of embodied semiotics (Bohm, 1987, p. 77).

In biology, Jacob von Uexküll took the continuity of the pre-organic and organic orders of nature to reflect the continuity of meaning and signification. This continuity is mediated by the *Umwelt*, the semiotic sphere around all sentient beings which makes the world meaningful to them because they

have evolved to live in it (von Uexküll, 1982). What things « mean » to an organism is a matter of active interpretation, not merely a matter of a reflex or brute physical causation. Equally, what an organism « means » to do is guided by signs from its surroundings. These signs are the traces of a history of mutually evolved transactions between active organisms and their surroundings.

Thus, bees perceive in the ultra-violet range and flowers have patterns in that range that act as guide paths to their nectar. The bee's perceptual system and the flower's pigmentation are the semiotic complements of each other. They arise as the material trace of a history of transactions of meaning that have accompanied the co-evolution of insects and plants. Such histories are found at all levels of the natural order ; they are the semiotic deep structure of nature.

Hoffmeyer (1993) presents an extended inquiry into this deep structure. He uses both Peirce and von Uexküll to create a semiotic account of how human subjectivity emerged from a background of organic order. As he puts it :

Subjectivity has its roots in the cosmos [...] We need a theory of organisms as subjects to set alongside the principle of natural selection; Jacob von Uexküll's *Umwelt* theory is just such a theory (p. 57).

Hoffmeyer provides a framework within which it is possible to link Peirce's semiotic interpretation of intentionality and Whitehead's notion of aim. This framework has much in common with embodied cognition :

Intentionality is the idea that our mental states are always « about » something « out there ». From a biological point of view there is nothing surprising in this [...] animals have nervous systems and brains ; and from the dawn of evolution their purpose has been to control bodily actions, behaviour (p. 47).

Human intentionality is a product of the transition from biological to cultural evolution. It is highly atypical in being reflexive. This reflexivity is deceptive and is the primary reason why cognitivism made the mistake of the « language of thought » hypothesis. To identify human consciousness, and by extension all forms of cognition, with that which may be abstracted and linguistically formalised is a variety of misplaced concreteness. Happily, the appearance of embodied cognition is a sign psychology is in the process of recovering from this mistake.

Hoffmeyer helps here. According to him, primordial, pre-reflexive intentionality does not depend on language but has been present from the « dawn of evolution ». He suggests psychologists and philosophers find reflexivity problematic only because they have missed what Whitehead spotted – the role of the body. Their mistake, he points out, is that :

They never consider that mental « aboutness » – human intentionality – grew out of a bodily « aboutness » (i.e. the behaviour necessary to ensure reproduction and survival) – what could be described as evolutionary intentionality, the anticipatory power inherent in living systems. We still cannot escape the fact that our minds remain embodied (p. 47).

Thus, like Whitehead, Hoffmeyer recognises that the body is the enduring vehicle that ensures the continuity of consciousness. The role of body is also central to embodied cognition. It is, as Merleau-Ponty pointed out, is a unique psychological locus (Merleau-Ponty, 1962). It is both the site of sensation, the origin of freely chosen action and the most immediately available object of which the human subject is aware. Add to this the human capacity for reflexivity and we have the mutually constitutive components of what Hurley calls « The Reappearing Self » (Hurley, 1998, p. 1). This reappearance along with the emergence of embodied cognition are signs that psychology and philosophy are recovering from the misplaced concretising of mental life as language. Embodied action, not language, underpins the human condition.

The body is the meeting place of the subjective and objective aspects of selfhood. Both the body and the meeting itself, are products of an intertwined history of biological and cultural evolution. This history makes the body, its surroundings and the interactions between them into one causally homogenous system. In as much as parts may be abstracted from this system, they are mutually constitutive. Recognising this mutuality is crucial in shifting the ontological assumptions underlying contemporary treatments of action and consciousness.

This is why embodied cognition is more than merely a theoretical change within psychology. In conjunction with the recent advances in biosemiotics, it is the sign that a new metaphysical framework is in the making. This new framework has therapeutic implications because it makes it possible to understand selfhood and its relationship to the world in a deeper way. This returns us to the therapeutic issues raised at the end of the previous section.

5. Therapy in a more than human world

The psychotherapist Sara Conn asks : « When the Earth hurts, who responds ? » (Conn, 1995). This question may at first seem too broad to be relevant to psychotherapy, concerned as that is with the disordered feelings experienced as people encounter the trials of life. However, Conn's approach is based on how human beings experience their connection to the world, in its deepest sense (Roszak et al, 1995). Conn finds that a preconscious awareness of this connection is a fundamental part of selfhood. If that awareness is a

source of anxiety, then the psychological consequences may well appear in psychotherapy. This is perhaps a milder form of the disturbances encountered in pathological conditions such as schizophrenia or paranoia, where the boundaries of selfhood become too permeable or are threatened in some way.

A healthy experience of selfhood depends on a feeling of benign ecological habitation, of being in good psychic order and part of a greater whole that has a place for you. That greater whole too needs to be felt to be in good order. The experience of health in pre-modern cultures seems to have been something like this, since « health » and « whole » are from the same etymological root. With the rise of modernity this experience has been obscured. Urbanisation, cultural uniformity and the destruction of diversity have all contributed to alienation and fragmentation.

Yet a sense that wholeness is necessary for health remains. It is difficult to be merely neutral about news of ecological devastation. There is also a dimension of responsibility here. Hearing of earthquakes and floods may cause us to feel sympathy, but not responsibility. When we hear of the imminent disappearance of a species we may not only feel sympathy but also a twinge of guilt. Some primordial sense of fellow feeling is at work, especially when the species concerned are close phylogenetic relatives, such as the apes. When we learn that chimpanzees and orang-utans are disappearing because of forest clearance, it becomes clear that this is not a natural disaster. When we learn that that clearance is driven by the geopolitical forces of globalisation, the role of human action becomes clearer still. When we learn that those forces are directly generated by the lifestyles that we ourselves enjoy, the chain of complicity is complete.

We are increasingly made aware that the lifestyles made possible by globalised technology are having a destructive impact on the biosphere. There is mounting evidence that globalisation and Westernisation, central to post-modernity, are just as destructive in the semiosphere. Destroying the rainforests destroys species but the spread of the internet destroys cultures. Loss of biological and cultural diversity is running in parallel. These are not natural disasters, but the outcomes of geopolitical forces. As the interdependence of the globalised economy and the integrity of the biosphere becomes increasingly clear, we realise we are both harmed by these losses and responsible for them. They become matters of personal concern.

Despite the distractions of consumerism this is a source of anxiety that can show up in psychotherapy. Sara Conn's question becomes more understandable. An answer requires a deeper inquiry into what the world means, both to the human beings who inhabit it and, more problematically, what it may mean in itself. The web of mutual relationships between plants, animal and

the material structure of the biosphere is a web of meanings. The mesh between organisms has evolved through the passage of meaning that creates relationships. Embodied cognition and biosemiotics will, together, facilitate an inquiry into this web of meaning. They will help human beings to understand their place in nature.

This is something that returns us to the issues raised in the introduction : the role of boundaries in the experience of selfhood. Un-examined assumptions about boundaries and their consequences are the concern of the environmental philosopher Arne Naess (Naess, 1973). He coined the term Deep Ecology to distinguish his ideas from the treatments of ecology encountered in biology, anthropology and more recently in political economics. These consider ecosystems much as geologists and agronomists might consider the rocks and soils. They are systems of the world « out there », in which scientific investigation is able to detect recurring patterns. Knowledge of these patterns can be the means to predict and even control the behaviour of systems to serve human ends. The « meaning » of the world is thus reduced to that of a mere standing resource. The plants, animals, rivers and the very materials of the ecosphere are means for human ends, not ends in themselves.

Naess calls this « shallow ecology » since it has little to say about the biosphere as something with intrinsic meanings and values that precede those projected on to it by human beings. Deep ecology, by critical contrast is about the values and meanings expressed in nature apart from or in parallel with those expressed in the human world.

Ecopsychology extends Deep Ecology by adding to it the inquiry into human experience and awareness of the biosphere. The purpose of this inquiry is to recognise and respond to the impact of technology over the last few centuries. For many people, this impact is simply the affordable price of improving human existence. The impact is considered to be slight in comparison with the massive climate changes and extinctions revealed in the evolutionary record. For others the price is too high. They fear that technology is reducing the carrying capacity of biosphere so rapidly that it may be permanently lowered.

Whether this fear is justified, it is clear that we are experiencing a rapid diminution of diversity. Moreover, the benefits of technology are disproportionately enjoyed by the rich while the costs are born by the poor. Technology is widening the gap between them rather than improving conditions for everyone. Taken globally, technology is violently destructive and oppressive. So much so, that it could be considered pathological, even insane, much as destructive behaviour in an individual would be considered pathological and insane.

The work of Conn and others who put therapy in an ecological context has been described as an attempt to « redefine sanity within an environmental context » (Brown, 1995, p. xvi). The environmental crisis is indeed a form of ecological insanity arising from the unrestrained creation of desires which cannot be fulfilled. On our present cultural trajectory is towards the situation where the material expectations of the majority of people will increasingly exceed the carrying capacity of the biosphere. If the present population of the world were to consume natural resources at the rate they are consumed in the rich world, two extra earths would be needed.

But they are not available, and the problems that face us are not going to be solved by using more technology. To attempt to do so is surely a variety of insanity. As a leading environmental commentator observes, what is required is a therapeutic psychological change, not a technological fix :

The great changes our runaway industrial civilisation must make if we are to keep the planet healthy will not come about by the force of reason alone or the influence of fact. Rather, they will come by way of psychological transformation. What the earth requires will have to make itself felt within us as if it were our own most private desire (Roszak, 2001).

Now embodiment, or more specifically the body, is a good framework for considering our most private desires since they originate there and they are felt there. Maslow proposed that we treat desires and needs as if arranged into a pyramid (Maslow, 1970). The base comprises immediate needs for air, water and food, then, further up are needs for security, belonging and approval and at the tip are needs for growth and self-actualisation. If needs at the base aren't met, those higher up cannot be met either. If you desperately need to breathe, you are not going to worry about where your next meal is coming from. If you are starving, your need to expand your spiritual horizons will have to wait.

The images of desirable things that are now flooding the world enter this hierarchy at many points. Parents are all too well aware of how advertising transforms the real needs of their children to gain approval and to feel part of their group into the false, and expensive, needs to possess clothes and electronic devices. Genuine needs are misappropriated to false objectives but the experience of need remains real enough, and the damage it does to individuals, families and cultures is enormous.

The question is : how are we to resist this ? We urgently need an answer since the generation of false and destructive desires is clearly one of the main drivers of environmental damage, both in the present and, more importantly, in the future. We need, individually and collectively, to take more care.

Again, a change in our experience of embodied self is significant. Naess observes that if damage to the environment were to be experienced like damage to the body, the necessary restraints on our actions would follow with very little political pressure being needed :

Care flows naturally if the « self » is widened and deepened so that protection of free Nature is felt and conceived as protection of ourselves. Just as we need no morals to make us breathe (... so) if your « self » in the wide sense embraces another being, you need no moral exhortation to show care (Naess, 1990).

If the meaning of « another being » is broadened to mean the myriad Beings of the ecosphere, the web of organic activity which makes up the living world, then this quotation sets a psychological and political agenda. It points to the cultural and psychological changes that must occur in order to restrain the runaway technology that is driving globalisation. Unless restrained it will become even more destructive than it is now.

Those who live in the rich countries have a particular obligation here. We enjoy the benefits of globalisation but export the costs to those in poor countries who have few resources with which to protect themselves. But to change our actions so that the effects of globalisation are benign rather than destructive requires we first change our experience of ecological habitation. This change is a long way off at present. To bring it closer we need to examine the implicit assumptions underlying the Westernised experience of selfhood that were noted at the beginning of this article. One is the assumption that there is a boundary between ourselves and the world and that we have a unique point of view from within it, directed outward at a world which is separate from us and on which we act. This sets individuals apart from nature rather than making them a part of it. The role of technology is central in creating a Westernised sense of self. As Heidegger pointed out, technology changes our experience of the natural world and makes it seem merely a resource for human action, with no intrinsic meaning of value in itself (Heidegger, 1977).

This modulation of our sense of ecological habitation is characteristic of modern Western cultures. Consequently it is hard for those in such cultures to subject it to conscious examination. But we sorely need to do this given the momentum of globalisation, which is in effect the spread of Western technology and the assumptions and values that come with it. Accordingly the implicit assumptions underlying the Western sense of selfhood seems set to have greater influence as the condition of postmodernity matures. The destructive consequences of this are all too obvious.

But set against this there is the pluralism that Havel identifies as a more benign aspect of postmodernity (Havel, 1996). Postmodernity is marked by the mobility of information, images, styles and ideas. In the resulting recombinant culture it becomes easier to synthesise new meaning from diverse

sources. More environment-friendly views, which recognise a continuity of identity and concern across the self/world divide, are found in some non-Westernised cultures. We may hope that these will survive and recombine with Western views and practices, thus to help to moderate the impact of globalisation.

While embodied cognition is not directly concerned with globalisation or environmental matters, it is a step in the right direction. It is the timely recognition that mental life depends directly on the body and the active role of the mind in the world. That active role cannot be properly understood unless the world is taken fully into account. Here « fully » means to recognise that the world is not merely a collection of objects whose roles are to be patients of actions originating in a separate subject. The world is an active participant in a flow of mutual organic activity. This flow is mediated by a semiotic exchange that passes through all levels of nature (Bohm, 1987, p.77). The more obvious forms of this flow are speech, writing, gestures and the other signs that accompany human interaction. But as Hoffmeyer (1993) makes clear, the flow is already there in the mutually evolved relations between the animals, plants and inorganic forms that comprise the biosemiotic deep structure of nature.

Biosemitics and embodied cognition both help to appreciate the place of mental life in the biosphere and thus to repair the misplaced concreteness of cognitivism. That epistemological dead end both derived from and supported the Cartesian self/world separation inherent in the Western understanding of selfhood. To reify the mind by identifying it with a disembodied soul, with language or with computations was to separate mind and world. It inherited the anthropocentric boundary implicit in the *Cogito*.

Whitehead was wary of boundaries and advanced the case for the continuity of organisms and their environments. But the idea of continuity, let alone the experience of it, is alien to the Western sense of selfhood. For example, the loss of ego that can accompany skilled meditative practice is treated with disdain by most Western psychologists. At best it is regarded as a pre-scientific, and hence primitive, method for investigating the mind. At worst it is treated as a pathological condition akin to those brought on by drugs.

Now loss of ego and other modulations of our conventional experience of selfhood can indeed be pathological. In the Western context, if people are unable to distinguish their own actions from other events around them or if they feel their thoughts are under the control of powerful others, we assume we are dealing with a disorder. But when properly managed and culturally contextualised such experiences are valued rather than dismissed. The experience of continuity and hence of common interests between selves and their

surroundings can be deeply benign, leading to the direct experience of what David Abram has called, the « more-than-human-world » (Abram, 1997). Seen thus, the world becomes the arena for all minds to express their diverse natures and not merely as the place where the means may be found to achieve human ends.

This experience is not, of course, absent from Western thought. It has merely been suppressed within the hyper-rational *milieu* of modernity. The suppression is not, and fortunately could not be, total. Here Whitehead's distaste for boundaries is all of a piece with his love of the naturalism of the art and architecture of the late middle ages as well as the poetry of Wordsworth, Whitman and Frost. In all these what delighted him was « a direct joy in the apprehension of the things around us ». (Whitehead, 1925, p. 27). That pre-rational joy departs with the arrival of treatments of mind that reduce it to disembodied mechanical abstractions. The implicit message of such treatments is separation and alienation.

Poets have long warned against the alienation that comes with the reduction of experience to mere mechanism. Whitehead (Whitehead, 1925, p. 96) quotes with appreciation from Tennyson's *In Memoriam* in which a pair of lovers sit under the night sky. She is terrified by the clockwork universe that has no place for them : « The stars, » she whispers, « blindly run ». Written around the middle of the nineteenth century, the blind run of the universe appalls Tennyson because it renders nature meaningless and leaves no place for the lovers' world of lived experience. If the blind run enters the human sense of selfhood in the shape of theories which reduce mental life to a mechanism, experience is alienated yet further. Hopefully, the appearance of embodied cognition, developments in biosemiotics and the resurgence of interest in processes thinkers such as Whitehead are all signs that this alienation is set to decline.

6. Conclusion

This paper has sketched some convergences between lines of thought in psychology and semiotics. The thesis is that these convergences represent the beginning of a much needed change in the Western experience of selfhood. The change will challenge the assumption that there is a clear boundary between the self and the world and between human and non-human experience.

Cognitivism primarily concerned itself with the rational-linguistic aspects of the human mind. There was relatively less concern with non-human forms of life. Their actions within their natural settings were generally treated as instinctive or reflexive. Hence, in a Cartesian spirit, they were down-

graded as somehow less than or secondary to the mental lives of human beings. But this is another aspect of Descartes' error. It is a mistake to neglect the actions and experience of other mental beings. They are the vast backdrop to human mental life, even though that takes centre stage for most philosophers and psychologists. They have produced the organic order, the web of mutually evolved meaning from which human mental life emerged only recently.

Embodied cognition and biosemiotics provide the metaphysical foundations for a better understanding of that order. The biosphere is actually a semiosphere, a matrix of meanings (Hoffmeyer, 1996). It is from this matrix that human meanings, Husserl's *lebenswelt*, emerge. That matrix still surrounds and supports the *lebenswelt*. To treat it as irrelevant or subordinate to human actions is deeply mistaken. To reify mental life as internal computation is a similar mistake. It draws attention away from the web of meaning surrounding human action. This web has produced the human condition and still sustains it. Cognitivism, in identifying mind with language, promoted a harmful separation of mind from world.

This is a specific instance of how modernism inserted false boundaries into the causally continuous natural order. Postmodernism has brought these boundaries into critical question and made us aware that they are either absent or observed in fundamentally different ways in many pre-modern cultures. Their beliefs and practices often concern the intimate continuity of the human and non-human worlds and the value of sustainable ways of life. For example, hunter-gatherer societies have conventions that conserve environmental resources by controlling access to them, while agrarian societies too regulate themselves to avoid over-exploitation of resources held in common (Reader, 1988). These practices rely on the interpretation of ecological signs which indicate how close a human group may be to the carrying capacity of their surroundings. The ecological web surrounding human action is in this sense a semiotic web. It is the source of signs which can be used to guide sustainable practices.

Underlying the concern that many people feel about the impact of technology is an intuitive sense that the ecological signs are bad. The technologically enhanced lifestyles of the rich are not sustainable. For the past few decades globalised media technology has seeded the world with images of these lifestyles, making them seem desirable and achievable. These seeds are now growing. Rich lifestyles are becoming the aspirations and expectations of the poor. If this were to happen the carrying capacity of the environment would rapidly be exceeded. The geopolitical consequences would be violent competition for dwindling resources. The wars of the past and the coming decades are signs that this process is well underway.

If the signs are as bad as they appear to be, more sustainable ways of life urgently need to be found. To do so will require the recovery of a deeper sense of how the human condition belongs in the biosphere. Reconceptualising our relationship with the more than human world is a crucial step in doing this. The image of mental life given by embodied cognition and biosemiotics is helpful here. Hoffmeyer, for example, reminds us that while human meanings are naturally the most immediate and salient to human concerns, they are neither the first nor the only meanings in the biosphere. As he puts it :

We did not invent meaning. This world has always meant something. It just did not know it (Hoffmeyer, 1993, p. 146).

This paper has sketched some convergences between psychology and semiotics. The thesis is that these will be therapeutic because they promote a deeper awareness of selfhood and its place in the world. To experience our place in nature more sensitively is not merely to enrich our aesthetic appreciation of the natural world. It is to begin the sorely needed task of controlling the damage caused by globalised technology. Sarah Conn notes, pre-conscious anxieties about this damage gives rise to distress which can appear in therapy. Recognising the source of this distress is a step towards a healthier experience of how human selfhood belongs in nature.

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