A Peircian Biosemiotic Approach to Understanding Human Ecology

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"I'm over-nighting eyes with a headlight deer stare, one-up Vin-Van, UPS an ear pair. Wear 'em if you need a new perspective on a weird year." (The Uncluded, Delicate Cycle)

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Dedicated to Oli.

CONTENTS

ABSTRACT

I argue that existence is infused with meaning, purpose; that the world we live in and our relationship to it can be explained neither through necessity and causation, nor through accidental happenstance, but only through the complexity of purposeful processes, a myriad of signs relating to and acting upon one another. I argue, following Peirce, that "all this universe is perfused with signs, if it is not composed exclusively of signs" (1906, CP 5.448 fn).

At lower levels of organisational complexity, communicatory practices abound almost without limit –within or between species, and across divides of organisational complexity, with every living thing in every environmental sphere capable of – and actively engaged in – the production and interpretation of meaning through sign relations. These communicative practices emerged and developed processually within their environments, from the least complex interactions of organisms with their environments to the complexity of the human semiosphere. The meaning infused into all of existence is not objective meaning, but subjective to both communicator and interpreter. Meaning is entirely open to interpretation, and can be interpreted differently than was intended.

We will first identify some of the shortcomings of current approaches which ignore the role of semiosis within nature, or which misunderstand or do not take into account the roles of (bio) semiosis in human ecology. The implications of a continued misconception of human ecology extend beyond any ontological concerns we might have, speaking instead to the very praxis of our continued existence on this planet. Central to this is the

question of human agency and freedom, and the origins of that agency; namely mind and awareness of existence, and their determinants.

For contemporary ecology to incorporate this position requires an hierarchical theory of natural interrelationships, within which ecological regulation and facilitation is economically accomplished through a diffuse multiplicity of low-energy expenditure processes of complex representation and signification, mediation and interpretation. Moreover, it is biosemiosis – emerging at successively higher levels of nature – which makes possible mind and human awareness, and thus human agency.

This thesis presents Peircian objective idealism (constructed architectonically through the further developments of synechism, tychism, and the revelation of evidence of a cosmic conatus) as a perspective which affords us a greater philosophical (and ontological, and practical) understanding of ourselves within this cosmos perfused with meaning than do any of the alternative conceptions of humanity and human agency which have hitherto dominated the discussion.

INTRODUCTION

Human life is saturated by meaning, and thus by processes of semiosis: the interpretation and production of meaning from signs. This is the world as we experience it – the human *Umwelt*. Our interpretation of all things depends entirely on our own attribution of meaning - that is, what we interpret as significant. A sign is only a sign when it is interpreted as a sign. In contemporary human life, ecology is a concern of undeniable importance, as it is the scale and pervasiveness of human-induced environmental impacts which have produced contemporary ecology's (and thus, humanity's) most pressing concerns for the very continuance of our species. This demands that we investigate the roles of human agency, and thus of awareness, and of mind, within nature - the source of human agency. I argue that it is biosemiosis - emerging at successively higher levels of complexity within nature - which makes possible mind and human awareness and thus human agency, and further, that through our own systems of prioritisation, we have reached a position of semiotic dissonance, whereby we have elevated in priority our own constructed systems of meaning hierarchically above and before all other forms of semiosis, in particular the biosemiosis we are emergent from and dependent upon for our survival, and through which we discover our legitimacy as a species within the biosphere itself. This thesis seeks to propose a method by which semiotic dissonance may be made consonant with Nature's patterns through a Peircian biosemiotic approach to understanding human ecology.

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While our lives depend on biosemiosis, we live, primarily, in a reality of our own culturally constructed layers of semiosis; from the economy, to the conventions of road travel, to our languages and systems of communications; we live daily in a world of our own constructed meanings. In lived human experience, these meanings come *before* any others in our interpretive schema – as a consequence of the requirements for the continuance of any particular life, it is necessary to be able to immediately interpret these relationships of meaning, as failure to do so would inhibit the functionality of the individual. In contemporary human life, a failure to functionally interpret the semiosis of the economy and our system of attributing (monetary) value through symbolic representation and ownership would leave an individual unable to access a great deal of human culture and endeavour, and would make existence in such a system quite challenging for such an individual, down to the level of biological sustenance. An inability to functionally interpret the conventions of contemporary road travel would possibly lead to the death of such an individual, as it might for a snake sunning itself on a warm bitumen roadway, for whom a road might be interpreted as just a long flat rock. An inability to interpret language and systems and conventions of communication would all but disqualify an individual from engaging with others within a given culture, potentially with results as disastrous as for the aforementioned snake. It is imperative for the individual to be able to functionally interpret such systems of meaning and representation, as they dominate our daily lives, and hold great consequences for misinterpretation. We, as humans, prioritise our own semiotic systems over others, and we are adapted as beings to respond more readily to short-term 'fires' than long-term 'trends' as a consequence of our relatively short life spans and the perilous nature of life itself.

An example of this adaptation may be found in the contrasting of global responses to the concerns of the environment and the economy. While we witness the most recent meeting of the Copenhagen Climate Council with still no unanimous agreement beyond the spirit of the 2007 manifesto, the contrast must be noted with the global response to the recent banking-induced credit crises (the most recent Global Financial Crisis, or GFC), and more narrowly, the response within the members of the European Union to maintain Greece within the European financial system. While argument and procrastination have characterised the response to the environmental crisis facing mankind, the response to the Global Financial Crisis has been characterised by swift and decisive action, almost ubiquitously.

Many arguments surround these contrasting responses – such as the role of industry in directing public discourse– however, it is only the biosemiotic ramifications of the argument that I would choose to address. Namely, the great distinction between the two concerns is the scale of complexity at which the meaning is being constructed. The semiosis of the environmental crisis is largely outside human influence and merely open to human interpretation. In contrast, the entire economic system of valuation, exchange, and presumption and expectation of unlimited growth is one of human-level semiotic construction, and has minimal effect on any of the hierarchically lower, constituent levels of natural complexity. Meaning is not determined top-down concerning levels of semiotic and biological complexity. Living nature, however, functions through biosemiotic processes, and unless the higher-level semiosis of human activity can successfully engage with living nature's biosemiosis in less harmful ways, the ecological crisis can be expected to continue, regardless of any meaningful agreement or legally binding commitment between countries and nation states.

And while the semiosis produced within the human *Umwelt* has no direct means of interpretation by successively lower levels of complex organisation, the endurance of those levels of complexity is still entirely dependent on the strategies of the levels of complexity above. Additionally, the higher levels of complexity (such as we can consider human civilisation) are always and entirely dependent on the maintenance and endurance of lower levels of complexity for their own endurance. I will argue that semiotic dissonance emerges when the dominant global human *Umwelt* no longer contains any referent or working interpretant for functionally lower levels of semiosis, with our own constructions coming to dominate our thinking so thoroughly as to blind us to the ecological ramifications which careful attention to biosemiotic relationships would reveal.

Semiotic dissonance

Semiosis can be understood as all of the activity involved in the production and interpretation of meaning involving signs. The etymology of some key terms provides a means of understanding ourselves as beings historically embedded, and can provide clarification of concepts lost in the historico-cultural dialogue. *Economy*, for example, comes from the ancient Greek meaning household management. How different might the state of the Greek economy be today if it was constrained by this original meaning? Of corresponding origin is a term central to this entire thesis: *Ecology*. While economy means specifically household management, ecology derives from the ancient Greek meaning household study. This definition has evolved alongside our understanding, however, and contemporary ecology is properly considered the study of the relationships between living organisms and their environments.

Ecology is a science of undeniable importance; and since it is the scale and pervasiveness of human-induced environmental impacts which have produced contemporary ecology's most pressing concerns, a deep understanding of human ecology is required to find a way to live sustainably as guests upon this planet (our *household*). This demands that we understand the ecological roles of human agency, and thus of awareness, and of mind, within nature – the very source of human agency. Biosemioticians argue that it is biosemiosis – emerging at successively higher levels of nature – which makes possible mind and human awareness, and therefore human agency. This thesis takes the argument of biosemiosis further, and attempts to ground biosemiosis and human ecology within the larger Peircian architectonic of objective idealism and its further developments of synechism, tychism and fallibilism, the ramifications of which will be revealed in the fullness of the discussion.

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We live in a world of our own constructed meanings, with currency being one good example of a *nothing* we take to be *something* - and for the most part, it works for us. When we have in our possession legal tender, all of the layers of meaning we have instigated *stand in* for the absent and unrepresented goods it might be exchanged for. Money is not food, or shelter, and the forms it takes can scarcely be used for either purpose - but as a symbolic representation it works for us (*for the most part*). But we also live in a world beyond our own constructions, which our metaphors and imaginations sometimes represent inadequately. And we get our attributions of meaning wrong occasionally. As our technological capacities increase, we certainly see more of the world around us – be it in the form of waves or fields, otherwise or previously *invisible* to our ken – but even then, we are restricted by our very physiology in *seeing* only part of what is out there, through various means. The strictures of our science decry the inadequacy of results gained in any other way − observable results always imply visually so; 'louder' means little if not quantified in measured decibels visibly represented, or 'colder' in visibly represented degrees. Are we similarly restricted in *looking into* ourselves? Would we recognise something for what it is, or possibly just see what we expect and find what we look specifically for? These questions raise concerns over the legitimacy of representation, the roles and models of metaphors we employ, and the importance of an adequate understanding of precisely the sort of beings we are. It is my contention that a system of interpretation is required to more closely align our own semiosis with the biosemiosis we are emergent from within – that we need to rectify the dissonance of our own levels of semiosis with that of living nature, and that the Peircian architectonic offers us the opportunity of a greater philosophical understanding of ourselves as beings than any other philosophical position.

Transcendental questions

Immanuel Kant sought to explain what possible relation or access we might have to metaphysical knowledge, and (as later did Peirce), felt it imperative to develop a specialised language able to reflect the cognitive relationships we can have to objects or events. In this, he sought to express the difference between what he called the phenomenal and the noumenal (1996: 298-302); that is, between how things appear to us (indeed, must appear to us), and how they truly are independent of how they appear to our perceptions and experience. His conclusions concerning the relationship between sensory apparatus and the mind's intuition remain problematic for us, however; as

Kitcher writes, "visual images do not emerge simply from retinal data, but require a great deal of processing." (1996: xxxiv). The discrepancy becomes further complicated as to whether that processing occurs in the sensory construction of the visual system itself, or whether it is the product of a process of cognitive faculties, or whether both are involved - and to what extent.

Kant left us with a clear problem, the foundations of which emerged from the mutually antagonistic grounds of British empiricism and European rationalism. In brief, empiricism, as championed by David Hume (most notably in *A Treatise of Human Nature* 1739), felt that we must limit all knowledge to experience, and that the mind is essentially passive. The rationalist position, championed by Leibniz, Descartes, Spinoza, and Wolff, gave more prominence to the role of reason, holding that it is possible for the mind to have knowledge of things going beyond empirical sensory experience.

Schelling approached Kant as a student of Fichte, and through the mediation of Fichte's *Science of Knowledge* (1804), which supported the position that it is only through self consciousness, or imagination (as the constitutive activity of consciousness of self) that a unity of subject and object, of presentation and thing, can come about. Through his *System of Transcendental Idealism* (1800) Schelling sought to find proof for this position by accounting for the objective world as defined according to processes of emergence, both subjective and objective to the self in its processes of becoming. In this complex interplay of processes, it is freedom within constraint which provides the necessary foundations for subjective becoming. The Schellingian conception of life motivated by an *a priori* drive or striving provides a standpoint of nature from which all aspects of life, mind and ideation can be seen as emergent within, as, and from, processes of nature, and processes of intention.

The Categories

Peirce, like Kant, begins with the position that the function of cognition is to unify the information brought to us empirically, through the senses. He further proposed that Kant's method, to be properly conducted, would require "the invention of a perfectly exact, systematic and analytic language in which all reasoning could be expressed." (Peirce, (R 895) (1931-1966), *Collected Papers*). Using this synthetic fictional language as a means of experimentation, Peirce deduced that such a language would contain only monadic, dyadic and triadic predicates, that is, expressions of valencies of one, two or three, but never more than three. In these sorts of expressions, in a language thus restricted, we can equate these relations of expressional valency with Firstness, Secondness and Thirdness, respectively; these are Peirce's universal categories. Not to deny that there is in fact any relationship, or conjecture which can exist which appears to have more than triadic interrelation with other elements and signs, but that such complex facades may be unravelled with logical analysis down to a complex multitude of monadic, dyadic and triadic relationships, and that this system of interpretation is our only means of knowing anything.

Firstness is the *Thing In Itself*, while Secondness is the sign our interpretation or perception of it takes. Thirdness is our own mediation between this Firstness and Secondness, and is where most of our cognitive self lives in dialogue with its selves. Accordingly, notions of such things as cognition, intention, and teleology are essentially triadic, consisting in the realm of mediation between Firsts and Seconds. Our access to any sort of Firstness is always mediated and thus a synthesis. The problem of any metaphysical inquiry, stated in its simplest, is that existence itself is not strictly intelligible. Peirce writes; "Existence per se is not intelligible. It is experienced, rather than cognized, as the brute, irrational insistency or Secondness of individual things." (Peirce, quoted in Goudge, 1969: 217)

So what does all of this suggest about our relationship with nature? To put things in Schelling's words, "The system of Nature is at the *same time* the system of our mind," (1803: 30) and it is only through a complex triadic dialogue that we have any access to the greater reality we are emergent from within. These insights will be explored and developed further in the course of the discussion, and can be considered central themes of this thesis. In particular, I will be investigating what precisely goes wrong when our understanding of Nature and of ourselves within Nature fails to take account of semiosis as intrinsic to Nature, and interpretation of that semiosis as crucial to our very survival as a species on this planet. As Boyden *et al.* write,

> In the long run, if humans and their civilization are to survive, then their economic and political systems must be attuned to the underlying immutable laws of nature. In the final analysis, biophysical realities take precedence over cultural arrangements. (Boyden, 1990: 266)

This thesis demands quite a lot of its reader; the journey required before we can begin to properly discuss and develop the insights of Peirce must first take on a very long path of discussion, most of which follows in Peirce's own developmental footsteps, and some of which carries on the dialogue which has continued since his death. We have also made effort to include what we can of the insights of both Husserl and Merleau-Ponty, for what opportunity may already be provided in offering a foothold into the Peircian architectonic we will be presenting along the way. There is a lot of ground to cover.

Namaste.

Section 1

Awakening to the Awareness of Existence

In this first section, we will be presenting the problem this thesis wishes to address: semiotic dissonance. We will begin with the question of the origin of human mind and agency, seeking to dissect the more dominant perspectives while tracing the historical dialogue as it has progressed. In Chapter 1, we will be presenting the development of Moderate Enlightenment metaphors and the emergent zeitgeist of methodological scepticism which greatly influenced the development of persistent metaphors regarding human mind and agency and the prevailing theories of mind we hold today. We contend throughout this discussion that it is the prevailing instrumentalist and mechanistic metaphors which have most prominently influenced these conceptions, leading to definitions of human mind as being either part of a mechanistically determined natural order, or to be otherwise non-natural if there is to be a possibility for free will. In Chapter 2 we further develop this discussion, first with a critical refutation of dualist ontologies (as it is only within the acceptance of such ontological dualism that mechanistic conceptions can accept the possibility of non-mechanistic free will and human agency), before introducing and examining the Kantian paradigm and finding it equally unfruitful for our investigation. In Chapter 3 we begin sketching alternative perspectives from which to identify the shortcomings of mechanistic and dualist ontologies, first returning to Aristotelian metaphysics before presenting other developments from the position of emergentism, and in so doing we will introduce many of the important themes upon which we will be returning throughout this discussion.

CHAPTER 1

Tracing the Emergence of Contemporary Mechanistic Human Self-Understanding

And the eyes of them both were opened, and they knew that they were *naked;*

and they sewed fig leaves together, and made themselves aprons.

- Genesis 3:7

This chapter introduces the co-emergence of modern science and contemporary mechanistic and dualistic conceptions of human mind and agency. These developments both contextualise and exemplify the goals, values and dominant metaphors of the 18th Century Moderate Enlightenment which have driven and continue to influence our current precarious ecological predicament, a contention which will be argued throughout this discussion. We will begin by tracing the development of the Moderate Enlightenment metaphors and assumptions which have come to dominate human ecology: the mechanistic paradigm and its underlying (and often unrecognised) dualist presuppositions in the methodology and philosophy of modern science, and in particular the assumption that if mind and agency are natural, that they must be mechanical, and its corollary that if they are not mechanical they must be non-natural. In subsequent chapters we will show how these Moderate Enlightenment metaphors and assumptions have led to the inability of contemporary paradigms to adequately identify and address our current ecological crisis. This is done with the aim of presenting an alternative approach capable of identifying what of value may have been jettisoned in the Moderate Enlightenment Project, particularly naturalistic understandings, intentionality and purpose.

We live in a world of constructed meanings, a world defined by our own systems of interpretation and semiotic prioritisation, and these systems are built upon theoretical foundations. Central to these is an understanding of mind, and thus of human agency. Traditional, and most 20th Century theories of mind, experience and perception either radically separate mind from nature, or subsume mind as a mechanistic aspect or part of nature, assuming that if mind is natural, it is essentially reducible to natural mechanical processes, but if it is not reducible to mechanical processes, it is therefore somehow non-natural. Systems based upon these theories have contributed significantly to the production of our current ecological crisis and our condition of semiotic dissonance. This chapter seeks to challenge these dominant conceptions, particularly the significance of the implicate dichotomy of ontological dualism introduced as the alternative to naturalistic materialism and associated determinism, particularly the ramifications with regard to free will, with such only becoming possible through the acceptance of such ontological dualism alongside mechanistic reductionism.

Metaphors, from Moderate Enlightenment to modern science

Thomas Hobbes is widely regarded as one of the founders of modern Western political philosophy, most significantly due to his profound metaphoric contribution *Leviathan* (1651). Developing what would come to be known as social contract theory, Hobbes sought to sketch a picture of "the natural condition of mankind as concerning their facility, and misery" (Ch.XIII). From one perspective, he identifies a *state of nature* – a condition we might inhabit if not for government, and ultimately, social contracts – as an almost primordial *bellum omnium contra omnes* ('war of all against all'). He simultaneously depicts a *nature* composed of clockwork mechanism, wound up, as it were, by the hand of a craftsman creator. The Hobbesian mechanistic (metaphoric) universe is composed of (almost fractal) repetitions of the same mechanical processes we use (and were used at the time) in industry, down to the very functions of anatomy;

> For what is the heart, but a spring; and the nerves, but so many strings; and the joints, but so many wheels, giving motion to the whole body, such as was intended by the artificer? (1651: 1.1)

The power of just such a metaphor would come to define the not only the zeitgeist which would emerge – not as linear historic causality – but as the spirit of an age, in various ways characterised by a dialogue which permits certain perspectives while excluding others by default.

In *Philosophiæ Naturalis Principia Mathematica* (1687), Isaac Newton provided a god's eye view of our physical universe which has largely dominated perspectives ever since. Describing and quantifying the *laws of motion* and *universal gravitation* which govern everything physical from the celestial to the terrestrial, Newton's depiction was of a universe governed entirely by mechanism. Newton's physics was a marked improvement on Aristotle's, by virtue of being universal, applying equally to planets and marbles, and mathematically systematic, setting standards of scientific method followed even today.

Concurrently, Robert Boyle (with use of vacuum pumps devised for him by Hooke) as the first modern chemist, published *The Sceptical Chymist* (1661), which not only developed experimental scientific methodology, but also an intense and rigorous scepticism which ruled out any theoretical hypotheses on any subject which could not be experimentally investigated.

In one respect, it is out of the triumph of such metaphysical reductionism that the first misinterpretation of the concept of mind comes into prominence. Alongside the rise of mechanistic, mathematised scientific and philosophical conceptions of nature emerged a similar understanding of humanity, and of mind. In this still-dominant conception, mind is in fact considered part of nature, but a mechanistic nature which determines mind as complex mechanism, reductively explicable. This, of course, leaves no room for the consideration of free will or agency, let alone intentionality and purpose, as we will discuss in more detail later.

Scientific method and the sceptical spirit

Before we examine how subsequent science has advanced and responded to Newtonian physics, and the implications of this for understandings of mind, it is worth a moment to consider philosophically some assumptions (and the ramifications of those assumptions) of this scientific method. No cultural development comes into existence in an instant, nor in isolation, and the development of the accepted scientific method itself can be understood also to reflect an emergent zeitgeist of methodological scepticism evident in both the empiricism of the 17th Century scientific revolution and the rationalism of Descartes.

Firstly, as with Boyle, the scientific method begins with methodological scepticism, as do Descartes' Meditations, both of them marked departures from Medieval scholasticism and Medieval science, which had never questioned the Aristotelian essentials in their methods.

Secondly, scientific methodological strictures which underlie confidence in the isolated conducting of individual experiments are akin to Descartes' epistemological rules for achieving justificatory certainty, abjuring the testimony of ages and sages.

Thirdly, in both, causal argumentation is eschewed in favour of single threads of inference which are built upon straightforward premises.

Fourthly, we encounter in both Cartesian nominalism and the scientific method not just a refusal to attempt to explain all things holistically, but the acceptance and setting aside of the contingently inexplicable or irreducible as inappropriate or unready for investigation. While Medieval scholasticism always had its mysteries, the *attempt* was made to explain *all things* – whereas for both Cartesianism and 17th Century natural philosophy, investigation must always be of *just this thing*, one thing at a time, with all other unknowns effectively sidelined as not relevant. In seeking to isolate and investigate the truth of just *this thing*, the scientific method effectively seeks to categorise and compartmentalise as a means of separating the known from the previously unknowable (motivated by an assumption of ultimate reducibility). The assumption inherent is that the unknowable exists necessarily (though only by virtue of our *necessary* divisions), and things *unknown* can effectively be sidelined as not relevant.

Could the very scientific method thus developed actually skew the subject of study? Aristotelian physics was incapable of eliciting the questions *answered* by Newtonian physics specifically because of the assumptions underlying it. A simple analogy might be found in medicine, where primary and subsequent effects upon physiology are categorised as sickness and symptom respectively. The construction of human physiology dictates that the majority of our sensory input comes from the exterior of our being, with considerably less means of gathering information within the core of our selves. We may have nerves capable of registering pain within our chests, but we still need to check our heart rate and blood pressure with external instruments, interpreted visually. In this respect, while our capacities become enhanced with every new technological innovation which allows us to *look inside*, the sceptical spirit which informs the scientific method proscribes further reductionism; in our metaphor further studying the symptom, at some point potentially elevating it ontologically irrespective of any sickness. An example of this might be found in the modern trend of medicating for symptoms, such as depression, rather than searching for causes of the experience of depression itself, or even in the Diagnostic and Statistical Manual of Mental Disorders, which has been criticised for providing diagnostic categories which may result in the mislabelling of mental illness and unnecessary and potentially harmful treatment with psychiatric medications because it has lowered diagnostic thresholds without sufficient empirical backing (Allen Frances, 2012). One notable characteristic of the scientific revolution of the 17th Century can be found in this shift of *causal theory*, which took a markedly mechanistic approach to the idea of causation and relationships of causality.

In consequence of the shift from Medieval organicism to 17th Century mechanistic theory (see Collingwood, 1942) and insistence on repeatability of experimentation, could not the experiments we design become similarly directed by the metaphor of clockwork repeatability in consequence? It is no radical suggestion that often we see what we expect, and in many cases find what we look for. The proliferation and variety of paradigms current within the multifarious specialisations would suggest there are many ways of interpreting the same information, even when obtained through the same methods (and informed, ultimately, by the same worldview). When the design of an experiment begins from a priori assumptions of what something *is* ontologically, that experiment is thereby designed to exclude any results or information which contravene that definition. With the metaphor of a clockwork mechanistic universe in place, cannot even the physiology of the body be explained as mechanical processes and extensions, as Hobbes so eloquently expounds?

And do not the very *shapes* of nature we investigate reflect not just our tools and experimental apparatus, but our very physiology and its limitations (and, concordantly, technological extensions)? As mentioned in the example from medicine, are we not influenced by the limitations of our own sensory capacities? Without the aid of technological extensions, we are not merely in the habit of observing things our own relative shape and size – we are absolutely restricted to the practice. As primarily visual creatures, with less developed tactile capacities, our accepted method of determining the *hardness* of a substance is not touching it, but scratching it against another substance and looking for visual confirmation of results (using the Mohs or Rockwell scales).

As our technological capacities increase, we certainly see more of the world around us – be it in the form of waves or fields, otherwise or previously *invisible* to us – but even then, we are restricted by our very physiology in *seeing* what is out there, through various means. The strictures of our science decry the inadequacy of results gained in any other way – observable results always implies *visually* so; 'louder' means little if not quantified in measured decibels visibly represented, or 'colder' in visibly represented degrees. Are we similarly restricted in *looking into* ourselves? Would we recognise something for what it is, or possibly just see what we expect and find what we look specifically for?

Further, does Boyle's rigorous scepticism not pave the way for fragmented specialisation? The principles of Bacon's *Novum Organum Scientarium*, referenced as they were to Aristotle, became enshrined in the work of Boyle (and Hooke, with considerably more proselytisation of Bacon), and in the very scientific method we adhere to today. Boyle had a particular penchant for experimental judgement, eschewing philosophical inquiry and hypothesis incapable of direct experimentation, even making efforts not to become predisposed to other perspectives by not reading them if he could help it. He felt the entire Cartesian philosophical effort anathema simply because none of the proposals were empirically challengeable, and he denied direct study of even the *Novum Organum* (Louis Trenchard 1941, "Boyle as Alchemist" *Journal of the History of Ideas*). Although he admitted to *transiently consulting* these ideas, Boyle's strictures are indicative of a changed zeitgeist of the *New Modern Era*: a methodologically sceptical spirit analogous with Cartesianism.

However, the argument can certainly be made, remembering the four principles of this zeitgeist we found informing the scientific method, that even Boyle's meticulous scepticism expresses all four principles. Boyle even begins with his own universal doubt which extends to his technical methods. Committed as he was to the experimental method, the same *spirit of Cartesianism* can be found expressed throughout his efforts and writings. Nowhere is this more axiomatic than in his refusal to engage with the inexplicable, which he regarded purely as peripheral information. In this simple classification of the relevant and the peripheral, can we not find the very genesis of fragmented, self-insulating specialisation? And with the provable and demonstrable prioritised, is it not conceivable that something falls by the wayside? By ruling out that which may not be experimented upon directly, may the complexity of the very concept of mind be cast aside?

Persistent Moderate Enlightenment metaphors

Newtonian science was overcome not by philosophy or argumentation, but by subsequent science. Classical mechanics, as it has come to be known, was built upon materialist reductionism, with the assumption not only of all complexity being reducible to ever smaller (and simpler) components, governed by the same immutable laws of relation, but of all processes being reducible to properties of and interactions of matter. Any change or process within this paradigm is merely a change in the relations between components of matter, and is subject to the same deterministic laws of cause and effect determining all matter. The categories of Newtonian ontology are restricted to three fundamental irreducible elements: the matter which composes everything; the space and time within which that matter moves and interacts; and the laws which govern those movements and interactions. Within this paradigm, all other ontological categories (such as mind) are either epiphenomenal to the interaction of matter according to natural law, or are merely particular distributions of that matter.

A Background to prevailing theories of mind

So what is mind? and where do we even begin with such a question? We live in an age defined by science and knowledge – if perhaps not always reason – in which assurances of our knowledge can be drawn just from the proof of our capacities. Mind (for whatever else it may be) is that which makes possible our knowledge, science and reason. That our towers and monuments stand are testament to our ability to reach toward the heavens, and when they fall and are rebuilt, are a demonstration of our tenacity to learn from and accept mistakes as a part of that very process of building and becoming (and also our hubris). Whether fashioning a tool from a stone, furnishings from a tree, or re-engineering genes, all of our wondrous effects have only been realised through our coming to know the world for what *it is*. Mind is that through which we are able to apprehend reality – and apprehend it *as* reality. It is not controversial to suggest we have been rewarded for our diligence in changing the world to suit our needs (or remaking it in our image), nor to suggest that this has only been possible by our coming to know the world *as it is*, and not merely as we want, or suppose it to be.

So what are we referring to when we talk about *mind* au courant? Largely it would depend on who we are talking to. The Renaissance ambitions best embodied by the legendary breadth of ability and study of Leonardo Da Vinci contrast starkly with the more directed efforts and concerns of the emergent new science which followed, as personified in Hooke, Newton, and Boyle. Legitimate science came to be synonymous with specialisation; for example, just as Medicine and Law are acknowledged as fundamentally different fields with different epistemological goals, methods and preoccupations, so too are divisions within them identified as requiring more depth – rather than breadth – of specialist investigation.

Scientifically, it is less objectionable to talk about *brain* than *mind*. Cradled within the larger school of medicine, the brain sciences study the brain (and thereby, it is supposed, the mind) from a multitude of perspectives, according to physiological specialties and paradigmatic commitments. Even within established specialist schools debates rage over definitions and delineations. With regard to defining the brain, it might perhaps be simplest to start with the uncontested aspects of its definition; the brain is the nucleus of all vertebrate (and most invertebrate) biological nervous systems, and its primary function is to regulate centrally the functions of the organs in the body.

Housed in the brain?

Empirical science is more comfortable discussing concepts of *brain* than *mind*, since the brain is deemed a proper object of empirical study, with observable qualities and functions. Mind, as such, is so much more difficult to catch under a lens (metaphorically or otherwise). One understanding of mind is the proposal that the mind is located somehow "in" the brain. Whether the proposal itself is accepted at face value or not (an opposing position suggests aspects of mind might also be found within the body, as evidenced through such phenomena as proprioception; see Sacks 1985), the very proposal itself implies that the concept of mind we are discussing is problematic for the standard model of physical science.

By the very distinction between *brain* and *mind*, we are accepting an assumption that the qualities deemed necessary for one are insufficient for discussion of the other concept. There is in fact a philosophical requirement – even within scientific discussion – to distinguish between the two concepts ontologically. Scientific knowledge requires admission of the unaccounted for. The scientific method, by seeking to restrict variables in its experiments, admits the limitations of its intended project and capacities, and restricts its claims to those things which it is entitled to make claims upon. Scientifically speaking, very few claims may be said to be made regarding the concept of mind, except perhaps, that it is located (or primarily located) somehow in the physiology of the brain.

While it is clearly beyond the scope of this project to properly investigate this claim, it is worth considering it nonetheless because in addition to being a biological and physiological postulate, it also cuts to the heart of some of the assumptions this thesis seeks to question. The simplest support of this claim might be found in what we might call the 'zombie proof'; that to permanently end the existence of any particular mind is as simple as "removing the head or destroying the brain". It can certainly not be denied that there is a fundamental physiological dependency of the mind upon the brain and its organic maintenance, but is the mind *restricted* to a physiological location within the organic brain, or is it perhaps extensive throughout the central – even peripheral – nervous systems, or perhaps even beyond?

The concept of proprioception may be interpreted as extending the physical *location* of the mind beyond the confines of the organ of the brain itself. Proprioception, put simply, is the individual's sense or perception of the physical location and relative position of the body's extremities. Observations, such as those documented by Oliver Sacks (*The Man Who Mistook His Wife for a Hat*, 1985), might suggest that the mind has a consciousness of itself as a complete organic being, including its physical extensions; a bodily awareness of itself.

Similarly, the phenomenology of Maurice Merleau-Ponty emphasises the "primacy of perception" in the "act of consciousness". From his first published writings (1942, *The Structure of Behaviour*, trans. Alden Fisher, 1965), Merleau-Ponty sought to disprove the Lockean tradition of atomistic sensation as causal product, insisting perception required an active embodied extensity in the cognition of a mind *doing* thinking. Following Husserl, Merleau-Ponty distinguished between the *noesis* of acts of thought, and the *noema* of intentional objects of thought, and took the bodily perceptive self to be the *permanent condition of experience* in which consciousness is formed through intentionality in perception, as a constituent of action. This might also be considered a development of Heidegger's notion of *being in the world*.

This proprioceptive sense of ourselves, whether it be a quality or aspect of mind or not, is physiologically explained as the communication between *adequate stimuli receptors* within the peripheral nervous system (identified in fruit flies, but yet to be discovered in humans), and the cerebellum, which is thought largely responsible for the non-conscious elements of proprioceptive sensation (*Encyclopaedia of the Human Brain*, 2002, Ed. V. S. Ramachandran). If we accept this proprioceptive sense as a quality of *mind*, then if the locus of the mind itself is not broadened beyond the nervous system, its extensive capacities must at least be expanded to include the peripheral nervous system and all other adequate stimuli receptors, such as for pressure, oscillation, palpation, temperature, irritation, light, sound, and any other sensory experience. We are not, however, by any means compelled to accept proprioception purely as a quality of *mind*, and can accept it as an aspect of our evolved physiology. We are, after all, not in the habit of pondering the minds of fruit flies. Is that perhaps, because mind is still commonly supposed to be something non-physical – a Cartesian "soul" – and a fly is thought not to have a soul?

Qualities of soul?

The concept of mind/body (or substance) dualism is not necessarily a religious doctrine. Descartes, in his *Meditations on First Philosophy* begins with his now familiar methodological doubt, which nonetheless presupposed several beliefs as being true. Firstly, the fact that you are thinking can be taken to be true, and consequently, you have belief-forming faculties. While Descartes did employ extensions of this argument in support of his various general arguments for the existence of a perfect god, his starting point approached the proposal from a logical, rather than religious perspective. He proceeded by questioning what this *I that is thinking* (and that therefore exists) *is*? Is the I the soul? Or is it the living organism? Put simply, Descartes denied that he was the body whose reflection faced him in the mirror, insisting that in having both a mind and a body he was composed of two distinct substances. Minds, in this regard, are thinking things – things which are capable of first person points of view, whereas bodies are extended things – things which are extended in space, and have physical dimensions. The underlying proof he attempts to establish in this argument lies in the proposition that no body is a mind, and no mind is a body – there is nothing that exists which is both a thinking thing and a spatially extended thing, but that through the combination of these two substances, mind and body form a whole.

> By means of these sensations of pain, hunger, thirst, and so on, nature teaches that I am present in my body not merely in the way a sailor is present in a ship, but that I am most tightly joined and, so to speak, commingled with it, so much so that I and the body constitute a single thing. (*Meditation VI*, p 51)

Simply put, Descartes was proposing that a human being is a thing with separate and distinct parts.

It is important to understand the ramifications of this position for our discussion of mind. The Cartesian model posits *mind* as essentially non-natural, and as utterly different from mechanical nature. This dualist reductionism radically separates mind from nature. It has been assumed that if mind is natural, then it is essentially reducible to natural mechanical processes, whereas Descartes takes this further in positing that for mind to be non-mechanical (that is, to not follow the same reducible mechanistic laws as all other natural substances), it must essentially be non-natural. In both of these cases, the theories and systems of inference which have built upon them have significantly contributed to our current ecological crisis and condition of semiotic dissonance.

Mechanical organisms

The dominant empiricist alternative to positing a non-physical mind is to deem mind a complex mechanism of a mechanical organism. Newtonian space provided a framework in which everything happens; a passive, eternal and unchanging stage on which action and motion occurs. Einsteinian space adjusts to the constancy of the speed of light, with space and time forming a unity as space-time. Both conceptions however, describe a mechanical universe. Consequently, it has been the prevailing instrumentalist and mechanistic philosophies of the Moderate Enlightenment conceptions of humanity and nature which have come to shape our lives and institutions, and the metaphors we use to describe our relations to the world.

There were two contending ideals and associated streams of thought in the European Enlightenment – these have been termed the Radical Enlightenment and the Moderate Enlightenment. Both have been influential, but the influence of the Moderate Enlightenment has dominated subsequent history. We might attribute its inspiration and beginnings to the founders of the *Royal Society of London for Improving Natural Knowledge*, who enshrined conceptions of nature within the experimentalist, mathematised, mechanical model. The metaphysical reductionism of Hobbes further entrenched this metaphoric view with his description of a mechanical nature, and his argument that *mind* is therefore a mechanical aspect itself. While Descartes postulated mind as non-natural, substantially and essentially different from nature, he too advanced the doctrine of nature as essentially mechanical. The Darwinian model of heredity with natural selection further entrenched this metaphor, leading to a Neo-Darwinian interpretation of mind, human action and society involving a more explicit genetic reductionism in elaboration of the prevailing view of mind as part of a mechanically explicable natural world.

Further, as technological capacities have changed over time, so have the technology-inspired metaphors that are used to explain the natural world. Hobbes used a metaphorical framework based on the mechanisms available during his lifetime; pulleys, springs and wheels - and not surprisingly, today cognitive reductionism equates the mind to neural computation, reflecting our modern technological engagement. The computational metaphor remains simplistic both in its characterisation of computation and in its application metaphorically. If Chuang-Tze were to have his dream in our current times, might he question whether he was a philosopher dreaming he was a drone, or a drone dreaming he was a philosopher, instead of a butterfly?

In this simplistic mechanistic reductionism, we have largely failed to explain the natural world and our relation to it, and our ecological predicament reflects this. This has in turn led to accusations that the Enlightenment Project itself has failed, based as it is in a "grand narrative" of "progress," now thought to be self-undermining. This grand narrative was, however, based on the prevailing Moderate Enlightenment philosophies whose perspectives based in experimental, mathematised, mechanical science, required the suppression of Radial Enlightenment positions of "romantic science" and philosophies of nature. Schelling, in reacting against the mechanistic tradition, provides us with a new perspective - at once placing humanity within his philosophy of nature not at the top of any hierarchy, but as an outworking of the very process of Nature itself; within this construction, ontological and teleological meaning are once again infused into human life and consciousness but as a facet of Nature itself, our uniqueness its uniqueness.

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This chapter has sketched a brief history of a single idea; the origins of human mind and agency, and to detail some of the most dominant perspectives in this ongoing dialogue. What we have not yet done is to properly present what this thesis identifies as the problematic consequences of these ideas, as we will only be in a position to do so as the discussion progresses and with the introduction of other key concepts. In the next chapter we will examine those problematic consequences, looking first at dualism, then Kant's transcendental modification on the earlier-discussed dichotomy, showing how Kant's transcendental "resolution" of the dilemma leaves both human freedom and human agency as unresolvable mysteries, and portrays our own nature as mysteriously and irresolvably divided. Later we will be introducing the path to Peircian cosmology through other paradigms, metaphors and ideas which diverge in their own ways from the dominance of dualist ontologies, mechanistic reductionism and other Moderate Enlightenment derivatives.

CHAPTER 2

Examining the Implications of dualist ontologies

"Tickets, please!" said the Guard, putting his head in at the window. In a moment everybody was holding out a ticket: they were about the same size as the people, and quite seemed to fill the carriage.

- Lewis Carroll, Looking-Glass Insects

This chapter develops the argument presented in Chapter 1, first beginning with a critical discussion of dualism then considering Kant's transcendental modifications on this dichotomy, before we can later introduce several alternative perspectives from which deficiencies in the mechanistic paradigm can be identified, deficiencies which mechanistic reductionism is itself unable to identify, let alone respond to. We begin first with our critical discussion of dualism because, as we have contended, the implicate dichotomy within mechanistic reductionism introduces ontological dualism as the only possible alternative to completely determinist naturalistic materialism, with the possibility of free will and agency only existing within the acceptance of such ontological dualism: free will only being possible if mind is not mechanistically determined. This discussion, and particularly its (rather insufficient) refutations of dualism is presented with the intention of showing that the dominant paradigm is not without its glaring faults and inconsistencies, and regardless, also leaves intentionality, mind-body interaction and consciousness just as mysterious and inexplicable as for a purely materialist mechanistic reductionism without any acceptance (however moderate) of dualist ontologies.

Examining dualism

Essence argument for dualism

The essence argument for dualism hinges on the philosophical definition of essence; that is, the essence of a thing is an essential property without which the thing itself cannot exist. Descartes' own logic (in his *Meditations*) is as follows:

1. For any *x* and *y*, if I can understand the essence of *x* independently of understanding the essence of *y*, then *x* and *y* are really distinct and separate things.
2. I understand the essence of myself independently: I am a thinking thing.
3. I understand the essence of my body independently: it is an extended thing.
4. Therefore, I can understand the essence of myself (as a thinking thing) independently of understanding the essence of my body (as an extended thing).

Understandably there have been a number of objections raised to this proposal. The first views it as a problem of semantics, and concerns the second premise of the argument. As mentioned, the essence of a thing is something which that thing cannot exist without, and it is questionable by this definition if I then can be defined as a thinking thing.

In this capacity, thinking is regarded by Descartes as an act or *state* of *being conscious*. It could be argued that there are times within my continued existence when I am not in the state of being conscious (such as being inebriated or comatose), yet I still continue to exist during these events. The objection becomes one of semantics in the simple refutation which may be given by changing the requirement in the definition to being *able* to think and be in a state of consciousness, as opposed to constantly and essentially requiring it.

The most significant objection to this argument was offered by Antoine Arnauld (1612-94), known as the *4th Objection* in the republication of Descartes' *Meditations*. Arnauld opined that it is one claim to know *an* essential quality or feature of a thing, but an entirely different pretension to claim knowledge of *all* of the essential qualities or features of a thing. Further, while it may be asserted that being *able* to think (as per the earlier modification permitted) is an essential feature of me, there is no reason to further accept that this is the *only* essential feature of me, and thus it is not to be automatically ruled out that being *able* to think may essentially be a feature of being an *extended* being (a possibility we will be returning to and examining in great detail over the course of this discussion).

Divisibility argument for dualism

Descartes' final attempt in the *Meditations* is known as the divisibility argument, and again is an exercise in close logical consideration, rather than religious doctrine or sophist persuasion. The divisibility argument is as follows:

1. Any mind is partless, and so is indivisible.
2. Any body has parts, and so is divisible.
3. Therefore, no body is a mind, and no mind is a body.

This argument hinges on two specific presumptions. Firstly, that we are unaware of any parts of the self – the *I*. Though that does not necessarily entail that the mind is indivisible. If the mind/self/the *I* did have divisible parts, why make the assumption that we would be aware of them? We need not be aware of the functions and parts of our sensory apparatus to draw input from our senses. Secondly, Descartes' definition of a body is built upon the geometrical idea of the infinite divisibility of a line, and merely assumes any physical object no matter its physical dimensions, can be divided infinitely. The simplest and most damning objection which might be raised to the entire argument is that it is built on objectionable or unproven premises.

While Descartes' arguments themselves have been challenged on many levels since their republication with responses to objections, his effort inspired many others to prove or disprove the existence of the soul or non-physical mind.

Swinburne's brain division argument for dualism

Richard Swinburne approached the argument from a unique position defending substance dualism through property dualism in his attempt to prove the existence of the soul in his 1997 work *The Evolution of the Soul*. He begins by first applying definitions to various ontological distinctions he feels are necessary. Of primary concern are three definitions of ontological categories (which are later subdivided in the course of his argument): 1) *Substance*, understood as a real, individual entity; 2) *Property*, a feature held by a substance; and 3) *Event*, a substance having a property at a time. In this, substance is first divided into simple substances and complicated substances, or thinking substances, which also have mental properties and mental events – which Swinburne defines as events to which someone has unique and privileged access (such as being aware of his or her own personal feelings or physiological state, e.g., hungry, tired, thirsty, bored, etc.). A physical event, by contrast is an event to which no one has any privileged access, and thus can be considered empirical. By these definitions, no physical event can be a mental event and no mental event can be a physical event. It is by this rationale of property dualism, or event dualism, that Swinburne advances his argument for the existence of the soul, which by the assumption that no one can have privileged access to a physical event implicitly assumes materialism is false.

For Swinburne, the denial of substance dualism required the acceptance of either a dual aspect monism, or some brand of non-reductive physicalism which accepted that while properties and events are different, the substance must still be one and the same. Swinburne introduced a simple thought experiment in which the physical brain of a subject is bisected and divided between two prepared and awaiting bodies. Assuming both 'new' beings survived the procedure, Swinburne posed the simple question of which 'new' person (person 1, and person 2 for clarity; person 3 provides the mind) was the original person. Logically to this there can proceed only 4 possible outcomes, one of which invalidates itself logically and can be immediately discarded. Either;

a) person 1 is person 3,

b) person 2 is person 3,

c) both person 1 and person 2 are person 3,

d) neither person 1 nor person 2 is person 3.

From simple analysis, we may discard possibility c as being incoherent, as the definition of the original person excludes the possibility of both person 1 and person 2 being the original person. We are therefore left with a, b, and d as possible outcomes. The weakness of Swinburne's argument is that it assumes a priori and implicitly the existence of the soul in the ongoing of the original person. To begin with, we are given no sufficient reason to agree with Swinburne regarding the indivisibility of substances. A simple counterargument to this might be found in the cellular division common to all life. Swinburne is therefore incapable given his perspective of recognizing the existence of a possible solution – that is that neither person is completely the original person, but each may contain an aspect or aspects of the original person.

Swinburne insisted that every conscious animal has a soul, forging a unique position based in a belief in evolution and emergent substance dualism, stipulating that somewhere along the evolutionary process, the soul came into being (into beings) alongside consciousness, whether it be separately, synchronically or as an emergent aspect of it. It is this very same problem that we will run into again with Schelling, Hoffmeyer and others in the quest to define the first emergent levels of biosemiosis. With Swinburne's position, we are not left with any reason to accept that any single-celled organisms have consciousness, and therefore no reason to suggest the attribution of a soul according to his definition. The brain division argument simply would not apply to amoebae in Swinburne's distinction, and his position is therefore resigned to the acceptance of the idea that somewhere in the process of evolution the soul somehow came into being without specifically requiring a particular type of underlying basis.

Swinburne's modal argument for dualism

Swinburne's further argument for the existence of a soul relies on distinctions of modality; that is, truths having to do with *what has to be* and *what cannot be*. Taking the example of near-death and out-of-body experiences, his argument went roughly as follows:

1) It is possible that I exist after my body is completely destroyed.
2) It is not possible that my body exists after it is completely destroyed.

3) For any A and B, A is numerically the same thing as B only if everything true of A is true of B, and conversely.

4) Therefore, I am not numerically the same thing as my body.

5) Therefore, I have an essential and non-physical part (my soul) in addition to my body (which is a non-essential, physical part of me).

The largest deficiency in the argument is that there are no clear grounds for accepting the first premise without already accepting substance dualism due to the circular nature of the argument. As Hasker (*The Emergent Self*, 2001) objects, the experiences associated with near-death and out-of-body experiences have been reproduced by chemically and electrically stimulating different sections of the organic brain in subjects. Quite simply, it is a feature of human consciousness to be able to imagine that which is, or turns out to be, contradictory, and even to imagine impossible objects. Simply being able to imagine existing outside of, or without a physical body does not make such imagined circumstances possible or non-contradictory. Thus the imaginability of one's existing after one's body is destroyed does not entail the possibility of that situation.

Interactionism

In a "notorious speculation" (Louis Pojman 2005), Descartes proposed the pineal gland as the actual point of unification and interaction between the physical body and the non-physical soul residing in, or piloting it. Swinburne was less specific, suggesting the brain itself was the point of interaction between the body and the soul. In support of this, he proposed what is now termed *Interactionism*, citing mind-body interaction as being synonymous with the equivalent interaction between body and soul. Put simply, this mind-body interactionism is an event in which changes in one state inform changes in the other state. This could occur in one of two ways; with the body's state influencing the mind/soul (such is in bodily intoxication of any sort), or through the mind/soul influencing the state of the body, such as physiological responses to varying states of awareness and readiness (fear, lust, anger, etc.). Problematic to this proposal is that there can be no suggestion offered as to how this interaction takes place (though this is no reason to deny its possibility) – it is incapable of empirical experimentation or confirmation, so any proposed relationship of causality or reciprocation remains only a logical possibility.

The Kantian Paradigm

Kant and the empirical order

The Kantian paradigm is itself enmeshed with the mechanistic paradigm, particularly in Kant's philosophy of the empirical order of nature. This creates a paradox within his own system because he conceives human agents as free, yet at the same time fully determined through mechanism. In order to overcome this inconsistency, he takes his transcendental turn, but in doing so not only fails to solve his own problem, but also fails to work beyond his own mechanistic conception of nature (and ourselves as natural beings).

Kant described himself as being roused from his dogmatic slumber (*Prolegomena*, p 260) by the arguments of Hume that empiricism cannot deliver necessary truths – that is, that experience can teach us that something is as it is, but not that it must be as it is necessarily. Hume (1739-40) exposed a deep problem in the claims of science to discover necessary truths about nature, and further, claimed to have shown that human beings are essentially irrational in supposing that there is a world of nature external to our minds, and functioning through causal necessitation. An implication here is that ampliative inference is irrational and has no place in logic. This disturbed Kant so very much because he thought rational autonomy to be a defining aspect of humanity, what makes us special in the universe.

Kant (1783; also 1785, 1787, 1788, 1790) responded with his transcendental idealism, agreeing with Hume that we cannot use experience to learn the necessary and the universal, but insisting that Hume has failed to prove we are incapable of non-analytic a priori knowledge. A priori knowledge for Hume is that which is known independently of experience and that which cannot be denied without a contradiction. For Kant, however, there was a second type of a priori knowledge – that which is known completely independently of experience but is not trivially true or a mere matter of definition. This *synthetic* a priori knowledge is not derived through analysis, but rather is intuited.

We can know, for instance, that all objects of experience and even cognition, are presented to us located within space and time – that is, that space and time are the preconditions for all possible experience. In order to see or even cognise the possibility of my desk, its being located somewhere in relation to the observer (or cogniser) is a condition for its existence or possibility. This is what Kant (1787) terms pure a priori knowledge, independent of experience or instruction by experience. We can know purely independent of all experience that for an experience (or even the conception of experience in the mind) to be presented, it must be within space and time. Even the imagination of my desk floating in a vacuum would be presented to the mind spatially;

whether it be at a distance or from a certain angle or perspective, it must occur somewhere and somewhen to be presented at all.

Pure a priori knowledge is that which does not depend in any way on an actual experience of something. By way of contrast, your knowledge that without substantial structure, my desk would be incapable of supporting the weight of computer monitors, books, or even papers – relies on experience of weight or understanding of gravity and is not *pure* in the sense that the conditions for experience of space and time are.

Phenomena vs. noumena

The phenomenal world is the world of everyday lived experience, as brought to us through the senses. The phenomenal world is as it appears to us, and is distinct from the world as it is in itself. Kant accepted the Cartesian / Lockean veil of perception – that there are representations which stand between us and the objects they are representing. Kant's distinction between the phenomenal and the noumenal (transcendental idealism) (1787) follows from a tradition going back to Plato which makes a distinction between our experience of the world and the world beyond experience itself, and which holds that representations mediate between the two. For Locke, there was substance: "something we know not what" (*An Essay Concerning Human Understanding* 1690: II.xxiii.1), and for Berkeley (1710) there was nothing beyond experience (subjective idealism). Kant, however, felt that through transcendental argument it is possible to know truths which transcend mere experience. While we cannot know the qualities of noumena as such, we can come to know that noumena do indeed exist. While Kant felt that space and time were absolute in the sense of being the essential structures of the human mind, he also was in agreement with Leibniz in feeling that they were constructs of the understanding and sensibility and do not exist outside of experience, that they are not part of noumena – not a property of the thing being experienced. Even the self for Kant exists in the noumenal and its qualities are unknowable and not found in experience (or in Hume's terminology, we never have an impression of the self). The noumenal self is transcendentally deduced as a precondition for experience itself – the something which generates the possibility of the ordering of all experience of the phenomenal. The noumenal mind for Kant is composed of two separate and united parts; the sensibility and the understanding, which are responsible for all of our experience. The sensibility is that through which noumena come to be presented to us as phenomena, as experience.

Space and time are characteristics of the sensibility, whereas the understanding is composed of twelve separate categories. Whereas Aristotle had proposed ten categories, Kant proposes twelve, organised into four larger categories (or "moments"), each containing three categories: Quality, Quantity, Modality and Relation. Kant was attempting to form a comprehensive list of ontological assumptions and implications underlying all possible subject-predicate propositions (or "judgments," as he called them). For Kant, it was enough to say that we can know absolutely that our experience will conform to the categories he formulated, and that they are the categories through which our minds (our understanding) constructs and orders the experiences brought to us through sensibility.

These categories are entirely phenomenological, however, and it cannot be said that they in any way apply to the noumenal. We cannot apply these categorical properties of the world of nature to anything in the noumena, which are outside of experience. Thus

Kant's philosophy of nature is a philosophy of the phenomenal realm, and in this respect contrasts with his philosophy of selfhood, mind, agency and freedom, which invokes both the phenomenal (natural, empirical) and the presumed noumenal ground of those characteristics of human uniqueness. We can say that it is true that there are things outside of our experience, but we cannot say anything about them. We cannot, for instance, say that the noumena of my desk causes my impressions of it. All of our science, then, for Kant, describes not how things are independently of human experience, but merely our experience of the world through the essential structures and operations of the human mind. We can know that it is by virtue of the noumenal that I can have experience of the phenomena of the desk, but I cannot study anything more than my experience of the desk.

With regard to mind, this leads to a very peculiar solipsism. In only being able to consider phenomenological experience, I am left without the means of proving the existence of other transcendental entities (in particular, other noumenal selves) within my phenomenological experience and can only be certain of my own noumenal self; the existence of other noumenal selves must remain merely a presupposition.

Kant did indeed offer a "Copernican revolution" for philosophy, reconceiving the mind as being not a passive recorder but the active constructor of empirical reality, uniting rationalism and empiricism, but in doing so he left us in no better equipped to explain anything of the relation between the noumenal world and the phenomenological than those who sought to do so before him.

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This chapter has followed the thread started in Chapter 1, considering the deficiencies particularly of dualist ontologies because, as we have contended, the implicate dichotomy within mechanistic reductionism introduces ontological dualism as the only possible alternative to completely determined naturalistic materialism, with the possibility of free will and agency only existing within the acceptance of such ontological dualism: free will only being possible if mind is not mechanistically determined, and thus not mechanism. This discussion, and particularly the (rather insufficient) refutations of dualism have been presented with the intention of showing that the dominant paradigm is not without its glaring faults and inconsistencies, and regardless, also leaves intentionality, mind-body interaction and consciousness just as mysterious and inexplicable as for a purely materialist mechanistic reductionism without any acceptance (however moderate) of dualist ontologies.

We have then further considered the ramifications of these problems for Kant, and have found ourselves in a position no better equipped to explain the world *as it is* than when we began the discussion. In the next chapter we will begin to introduce some positions from which deficiencies in the dualist and mechanistic paradigms may be identified and responded to, particularly Aristotelianism and Emergentism.

CHAPTER 3

Toward an Alternative Paradigm

How a world outside us, how a Nature and with it experience, is possible –

these are questions for which we have philosophy *to thank;*

or rather, with *these questions philosophy came to be.*

- Schelling (1803: 10)

This chapter develops the argument presented in the previous chapters, introducing several alternative perspectives from which deficiencies in the mechanistic paradigm can be identified, and that mechanistic reductionism is itself unable to identify, let alone respond to. The perspectives that we will be engaging with are the Aristotelian and the emergentist. We seek to identify what may have been cast aside in the Moderate Enlightenment Project, and what other conceptions may provide an alternative perspective on human mind and agency, with many of the ideas introduced in the final section of the chapter forming the grounds for subsequent discussion.

Aristotle's lamp under a bushel

We will now look back to Aristotle in an effort to recover what has been lost within mechanistic reductionism and to view Nature, causation, and ourselves in a different light. What can be glimpsed from this perspective (whether or not Aristotle himself was in a position to see it) is the possibility of understanding Nature (and hence ourselves) as creatively emergent. Having identified deficiencies in the prevailing mechanistic and dualist definitions of mind, what other conception of mind may be available to us? Since Newtonian physics is essentially mechanistic, the Aristotelian physics which preceded it might be a good place to return to in order to inquire whether anything of merit may have been lost. Aristotle argued from a position of universal teleology; that is, the proposal that the universe as a whole, and everything in it, has a purpose, or telos. Where Newtonian and later physics and metaphysics seek only to understand *how* something came to be as it is, Aristotle insisted on considering *why* something came about. In looking for such causes, Aristotle was far more explicit in his use of the term, and described four separate types of causes which together fully elucidate why a thing is as it is.

Aristotle's Four Causes

Aristotle understood the concept of purpose in terms far less abstract than we use today, and much more human. In several ways, Aristotle's four causes suit explanations of the human world more easily than the natural world, but that, we shall see, is largely due to the metaphoric conceptions we have adopted with regard to the natural world, and how they contrast with Aristotle's own assumptions.

The first of the four causes is the *material cause* – the matter which composes something or makes it possible, such as the wood and plastics of the desk at which I am sitting. Material cause is an interesting one with which to analyse our largely plastic modern world, plastics being derivative of petrochemicals, which themselves were formerly living matter. In this sense, the material composing something cannot be confused with its *substance*, which Aristotle understood in much more absolute terms.

Substance, for Aristotle, is "that which stands alone," separate from the quantities (such as dimensions), or qualities (such as colour or character) which describe a thing; substances are the most basic level of Aristotle's metaphysics – things which have their own nature, much akin to Plato's Forms, but of this world and no other.

Second is the *formal cause* – the principle or law by which something is made or comes to be. For the desk I am writing at, the formal cause not only includes design elements the artificer or engineer intended, but also reflects the peculiar human shape – the quantities and qualities associated with my body, how and where it bends, and its rough general dimensions. In this, the desk I write at is formally different from the chair I sit upon because the chair cannot in itself fulfil the formal functions of the desk. In this sense, formal cause always tells a story of some sort (in conjunction with the final cause) – and provides information of a specifically inductive type – you can tell a great deal about me as a being from the desk I work at. In this way, Aristotle's four causes are ideally suited to narrative modes of explanation and understanding. In contrast, Newtonian efficient causation is less suitable for narrative explanation, as its story is merely a series or sequence, lacking the complexity available to narrative understandings.

The third cause is the one we would be most familiar with (and what modern science would consider the "cause" of something in more general terms), which Aristotle terms *efficient cause* – the specific circumstances that produce something, or by which it comes to be. For my desk, this is the manufacturing processes which produced it. From Newtonian physics to Darwinian evolution, it is always the efficient cause which is sought as an explanation for *how* something is as it is, and the efficient cause excludes from its explanations any concept of *why* something is as it is, except, as in the life sciences, when related to what function or purpose may be served by it being so (for example, how a biological adaptation came about in Darwinian terms – the long neck of a giraffe, or the claws of a cat for instance). In this sense, our modern scientific metaphors, such as Darwin's metaphor of natural selection, still do in practice concern themselves to varying degrees with others of Aristotle's causes; however, scientific reductionists hold that these metaphors are just loose talk, and that all causation is at bottom entirely of the efficient sort, and in this we see the division of physics from metaphysics as was maintained by Bacon (1620).

As has been interpreted by a number of philosophers of science - for example by Ernst Mayr (1992), James Lennox (1993), and Francisco José Ayala Pereda (2007) - the very concept of adaptation is characteristically teleological, and even Darwin uses the term *final cause* in *Origin of Species* (Lennox, 1993). The fourth cause identified by Aristotle is the *final cause* of a thing, which is the purpose, *telos* or "end" of the thing itself. The final cause of my desk is closely related to its formal cause, in that the purpose it is designed for reflects many of the same qualities and quantities of myself as a being – indeed, as a purposeful being, and hence the purpose which it must serve if it is to be a desk, and in this we can see the final cause as the counterpoint to the formal cause (*Metaphysics* I, 3).

Unsurprisingly, considering the thoroughness of his analysis, Aristotle also left room for the concepts of spontaneity and chance, even among things that serve a purpose (*Physics* II, 5), and here we have yet another foothold into our discussion and definition of mind;

> Clearly, then, chance is an accidental cause in the case of things that serve a purpose and are normally deliberate; hence, mind and chance are concerned with the same thing, since there is no intention without mind. (*Physics* II, 5)

Aristotle uses the term "accident" to designate qualities and relations that are not part of a thing's *essence*. Thus by "accidental cause" Aristotle meant that a *chance* cause is not part of the *essence* of that whose cause it is. It must be noted, however, that in absolute terms, Aristotle felt nothing was caused purely by chance, and therefore all things had a *telos* of some sort. In rather Darwinian descriptive terms, Aristotle concludes by defining chance and spontaneity as

> accidental causes in the case of things that do not happen either always or usually; and among these they are causes of things that might have a purpose. (*ibid.*)

And he insists that all chance and spontaneity must be considered as secondary to mind and nature, which are prior to any possibility of accident or incident. In this, Aristotle believes that chance occurs only within the constraints imposed by the four causes.

The matter, the form, the mover, and the purpose: Nature

Aristotle's reflections on causality lead to one definite conclusion regarding nature: that nature is cause, and is purposeful.

If one were to be walking in an uninhabited wilderness, and were to come across the desk I now write at, exactly as it is, nestled among the thicket, it would be a reasonable assumption that some person had come to that place before and had left it there. As many diverse forms as nature takes, it would be absurd to speculate that just such a thing as I now work at could come about exactly as it is by natural means (i.e. without human artifice). The design it reflects in no way serves to produce or reproduce itself there in that environment, nor does it actively reciprocate or interact with the natural environment; it simply doesn't belong. While this is not to say that in all of Nature it is inconceivable that something of a naturally occurring form could serve adequately as a desk, the proposal that this exact desk might be found to have been spontaneously generated in that environment is unreasonable to the degree of being preposterous. Likewise, if one were to be deep sea diving or in a submersible craft in a deep part of the worlds' oceans and came across the same desk, in its exact and present condition, one would be compelled to assume it somehow found its way there from human hands, or at least from somewhere else – from a ship wreck, or due to a tsunami or some other happenstance (and very recently, if in the exact state and condition that it is presently).

The desk I write as is specifically designed for one such as me, for my shape and environment, and the likely uses to which I will put it. In any sort of state of nature, the desk is incapable of countering thermodynamic entropy in the way a living thing might, and would be destroyed by other processes in quite a short measure of time, first separating into its component parts, and eventually decomposing into its aggregate molecules – those capable of use being used by other natural processes, and those incapable (such as the plastic parts) merely breaking down into smaller and smaller pieces. While the desk may be of material originally from a forest, it has been ontologically changed in the process (the four causes) of becoming a desk, and is incapable of returning to its prior state.

While my desk is manifestly a product of human life and mind, it is not, in and of itself, alive, nor is it (in the usual sense of the term) natural. It contains within itself no self-generating or self-perpetuating potentials, and is merely a tertiary or subsidiary product of a natural emergent (that is, of human agency, where humans and their agentive powers are viewed as natural emergents). Natural emergents, following Aristotle's account of the four causes, are those which have nature as their explanation for all four causes. The matter of which they are composed is a direct product of nature and its processes. The forms which they take are direct reflections upon and adaptations to the environments from which they emerge. The circumstances which produce them are natural emergent processes. And the purposes which they serve are natural purposes: self-perpetuating, self-generating and self-sustaining, and with dependencies on and reciprocities with other natural processes and emergents. So what then, is the purpose, or telos, of human life and mind and could it be a natural purpose / *telos*?

The absential nature of purpose

Terrence Deacon (2011) examines what he terms the specifically absential character of purpose. He argues that all postulation of end, function, telos or purpose, and thus all meaning and meaningfulness imputes a paradoxical property which exists (or is thought to exist) in reference only to something extrinsic to the thing itself which is thought to have meaning or purpose, concluding that this absential quality of purpose "is a defining property of life and mind" (p 666). This absential nature is, of course, not limited to the concept of purpose, but is a defining quality of semiosis, and as Deacon theorises, so too are "information, function... meaning, intention, significance, consciousness and value defined by their fundamental incompleteness" (p 38).

My desk would (I imagine) seem very pointless to a cephalopod intelligence. Even one raised from birth in captivity, who through the structures of its containment had become accustomed to right angles, would see my desk as a meaningless obstruction. My desk is rather specific in this sense, only really being a desk to me, and to others who shared my shape and intentions. Without me (or anyone else of human shape and intelligence) to sit at and make specific use of it, my desk is really nothing of significance or purpose at all.

My desk, in this sense, might be considered a tool, or instrument designed and created for purposes I (or another human) have intended for it. This end-directed purpose, however, is an aspect of me and not of my desk at all. The use of the desk is certainly not restricted to holding books, pens, papers and computer monitors, and a differently minded being or individual might put it to completely different use, for example, as a shelter, a barricade, an obstacle to jump over, fuel for a fire, or potentially anything else for which it could serve a function in praxis or imagination. In this sense, the end-directed purpose and functional use of my desk is open to interpretation and new cartography, much as the mind of a child can amend the given purpose of a collection of cushions to make it a pillow fort, creating new uses for something at will. The purpose and definition of it as a desk are relative to me, to my interpretations and intentions.

In the same sense, all functional and semiotic aspects of our lives emerge from an absential phenomenon or relationship. Our currencies, languages, cultures and customs – even our biological needs – refer to a fundamental relationship of absence. Deacon terms this absential quality e*ntentionality*:

> a generic adjective to describe all phenomena that are intrinsically incomplete in the sense of being in relationship to, constituted by, or organized to achieve something non-intrinsic. (p 43)

As we shall see later in our discussion on Peirce, this is another way of describing the complexity of sign relationships, and the character of Thirdness which synthesises the ontological character of our existence and our relationship to it. Deacon, however, grasped an axiomatic aspect of this when he described the phenomenon of conscious human experience as "the quintessence of an ententional phenomenon" (p 51).

Conscious experience, Phenomenology

In what he described as "a new, twentieth century Cartesianism" (Husserl, 1929, *Paris Lectures*, trans. Koestenbaum 1975), Edmund Husserl's transcendental phenomenology ascertains the *essential rules* or *ideal laws* of all experience to be found not in any Platonic "world of being," nor in language or sign systems, but in consciousness itself. Husserl conducted his most significant work dealing with consciousness, subjective judgement and time, in the early twentieth century, during what might be considered the height of High Modernism, when the ideas of Romanticism and the Enlightenment were thoroughly brought into question, and while Einstein was working on his theories of Special and General Relativity and the world was reeling from the trauma of the Great War. Following Hegel's *Phenomenology of Spirit* (and Kierkegaard's critiques of it, which fiercely denied that observation could reveal anything about the spiritual world), Husserl borrowed the Hegelian terminology while rejecting the ideas of an absolutely transcendental Platonic realm.

It is important to understand the historical context and cultural milieu in which Husserl developed his phenomenology of conscious experience, attempting to align mental phenomena alongside other *ologies* such as biology, geology, and the emerging psychology, as a concrete discipline of observation and scientific categorization. In his attempted unification of psychology and philosophy, Husserl made no distinction or initial division between different types of mental phenomena, uniting all types of mental phenomena – thoughts, feelings, ideas, concepts, dreams, and even hallucinations – as legitimate objects of study. Husserl was concerned with the nature of being itself, and sought to remove the Cartesian dualism between the mental and physical realms, seeking to create a unified system of the subjective and objective aspects of existence.

He begins largely from the same position as Descartes, seeking an explanation of how and why existence itself is possible at all, though he felt that Descartes came to the wrong conclusion about this. Similarly to Hume, he proclaimed that all phenomena are mental phenomena. However, in opposition to the Representational theory of consciousness, which states that reality is not experienced directly, but through representation, Husserl felt not only that consciousness was always *about* something (the *intentional object*), and was not *in* the mind at all, but in the *essence* of conscious experience, allowing for us to make judgments, through intuition, about objects of intentionality.

Intentionality, conceived as "aboutness," is at the same time what consciousness is directed at (or "inclined toward" in Deacon's terms), and *where* consciousness *occurs at*. Intentionalities need not be physical objects of perception, but also include anything consciousness might be conscious of, whether it be real, imagined, felt, or dreamed up. Although Husserl aimed to combat relativism by proving that certain rules were so essential to all human thinking as to be considered transcendental, in fact his rebuttal of relativism was less successful than Kant's due to the sheer variety of forms of consciousness itself and the perspectival nature of being conscious. Husserl's rationalist analysis is only capable of establishing highly general characteristics of consciousness, leaving the particularities open, and thus opening the door to relativist interpretations of those particularities. In a manner of speaking, Husserl hung himself with his own *nous*. In establishing all meaning (*sinn*) within all noetic content, Husserlian phenomenology becomes a new form of relativism, allowing for an infinitude of different modes of existence from different perspectives through the emphasis on the noema of perceptual experience. Part of the anthropology of *nous* is accepting that the intellectual self influences all explicit awareness, with subjective personal identity coming into influence in all acts of consciousness, thereby becoming subjective, or "mental events" in Swinburne's terminology.

Language worlds

This raises another issue, one of the semantic origins of truth, as all methods of analysing and interpreting reality are already preconditioned by socially derived knowledge and by structures of language itself. While the generative grammar theory (Chomsky, 1957) suggests that we cannot think outside of the intra-structural limitations of language, Steven Pinker (1994) proposes a deeper structure to the nature of linguistics, with a "mentalese" (a hypothetical language of thought) that precedes the apprehension of any and all specific languages. The example is also made throughout the work of Ong (1982), that communicative technologies and language itself, structure and restructure the modes and processes of conscious formation. Just as writing restructures consciousness, the very boundaries of legitimate discursive formations define how we can conceive of the play between them. What is considered a legitimate discursive form determines whether an idea is to be accessed at all (genres offer a simple insight into these phenomena).

This semantic theory of truth raises some rather important arguments for the phenomenological position, as truth in this perspective concerns our own constitution of reality – a relativistic position that holds that there is no independent *truth* extrinsic to our own conscious architecture of reality. One interesting perspective from which to approach this is in the analysis of the historically dominant languages of philosophy in general terms. As any student of philosophy is aware, it is often necessary to return to the original languages of philosophers to come to an understanding of their true meanings. This is particularly true of German and ancient Greek philosophers, whose native languages differ greatly in some respects to the English in which I type and think. It might even be suggested that such languages as Greek and German offer something the English language does not which lends itself to more philosophical ways and modes of thinking. Such terms as *wissenschaft* have no direct correlate in English, and require multiple extended terms to describe effectively. The simple translation as "education" in English has an altogether different meaning which suggests a product or accomplishment handed down rather than a process of becoming and personal growth.

If language plays such a pivotal role in our construction of reality then, why should it be conjectured that the way we describe the world is anything more than a narrative of the only way that we can in fact describe it within the confines of our own language? Why should we hypothesise any structure to reality apart from the structures we impose upon it through our own uses of language? And further, might not any and all *necessary* or categorical truths we arrive at merely be conceptual truths built into the very structures of the language we are thinking and philosophising in? Is it actually more difficult to *do* philosophy in English than in German or ancient Greek? Within the domain of far-from-equilibrium non-linearity, constraints (such as those imposed by language) not only delimit activity, but condition the very possibility of emergence. It may be that certain (philosophical) developments in human thinking could only have emerged in cultures using alphabetic language, whereas certain other developments may only have been possible within other cultures using pictographic written languages, and other developments within oral traditions (as is suggested by Ong; 1982). Such non-linear emergences suggest that our *reality* is always more than our current linguistic modes or constructions, and what has been termed the human noetic *Umwelt* has potentially unlimited extensibility. This idea will be examined at length in Chapters 5 and 6.

Laws of Nature and mind – Emergentism

Schelling approached the question of our relationship to existence from an altogether different direction to Kant. Schelling approached Kant as a student of Fichte, and through the mediation of Fichte's *Science of Knowledge*, which supported the position that it is only through self consciousness, or imagination (as the constitutive activity of consciousness of self) that a unity of subject and object, of presentation and thing, can be postulated. Through his *System of Transcendental Idealism*(1800), Schelling sought proof for this position by accounting for the objective world as defined according to processes of emergence, both subjective and objective to the self in its processes of becoming. In this complex interplay of processes, it is freedom within constraint which provides the necessary foundations for subjective becoming,

> Freedom is the one principle on which everything is supported, and what we behold in the objective world is not anything outside us, but merely the inner

> limitation of our own free activity. Being as such is merely the expression of an impeded freedom…. We should have no conception of an activity restricted, if there were not at the same time an unrestricted activity within us. This necessary coexistence of a free but limited, and an illimitable activity in one and the same identical subject must, if it exists at all, be *necessary*, and the deduction of this necessity appertains to that higher philosophy which is both theoretical and practical at once (p 35).

The then-unnamed dialectic proposed by Schelling posits the self as both activity and limitation, and its processes of self-consciousness as both subjective and objective to itself in stages, coalescing as the "absolutely objective, or law-governed nature of intuiting becomes an object to the self itself," though only "through the influence of other rational beings" (p 235).

Taking a position Kant arrived at in *Anthropology from a Pragmatic Point of View*, that the concept of 'I' is the uplifting point of the self into philosophical thinking, Schelling further developed this conception of *self* as including more "than the mere expression of *individuality*; that it is the *act of self-consciousness as such*"(p 31), and that this is the process whereby the self becomes the *self to itself*, as "only what *is* not originally an object can make itself into an object and thereby become one." In what has been termed by neo-Kantians and neo-Hegelians as 'Aesthetic Idealism,' Schelling proposed a transcendental system of hierarchical achievements of self consciousness (which Peirce would later come to accept) in which Aesthetic exists as the highest elevation of self-intuition. In positing the noumenal as a process of the coming to be of the phenomenological itself, Schelling introduced a conception of *Naturphilosophie* in which we are not counterpoised with nature, but emergent from within it, all matter itself a process of mind.

It is from this position of Schelling's that Peirce's personal outlook was changed from the earlier insistence on the primacy of mathematics for logic, inherited mostly unconsciously from his father, to a more Schellingian construction in which logic was directly subordinate to ethics, and ethics in turn to aesthetics. Schelling effectively contrasted the processes of mathematics with those of philosophy, positing the intuition employed in mathematics as being an *externally* existing intuition (pp 13-4), in contrast with the *absolutely internal* investigation of the *act of construction itself* required by transcendental philosophy. Elaborating on this *identity* of nature and the world of ideation, it is Schelling's ultimate argument, which Peirce picks up, that nature IS *a priori*. Schelling's *Naturphilosophie* necessitates:

> not that Nature should coincide with the laws of our mind *by chance*…, but that *it itself*, necessarily and originally, should not only *express*, but *even realise*, the laws of our mind, and that it is, and is called Nature only insofar as it does so (1803, pp 41-2).

Nature is conceived as original and the source of self-creation, abstracted in Lorenz Oken's generative history of mathematics in which he seeks to elucidate how the number zero has emerged out of itself as it was *previously* a negation, and then was a finite zero, a number (1847: 7). Following Fichte, who considered the *highest exhibition of intelligence in nature, is the drive*, the Schellingian conception of life motivated by an *a priori* drive or striving provides a standpoint of nature from which all aspects of life, mind and ideation can be seen as emergent from within, and processes of, Nature. It was obvious even to Schelling, however, that any unrestricted growth can only be defined as cancerous, and that every process in nature conducts itself in *thoroughgoing restriction: nothing just acts*, rendering the concept of *life-force* entirely self-contradictory, as all forces in nature must be considered equally opposed (by the definition of N/nature) (1800: 37).

If we accept this proposal of *thoroughgoing restriction*, what then is the role of freedom? We are now finally in a position to begin our argument in earnest, aiming to develop over the following chapters increasingly in-depth investigation into what it is to be human, beginning very broadly at first, from the perspective of embodied being and existence, and proceeding to a detailed consideration of what we term the human semiotic condition. Following this, we will then present the Peircian architectonic as a possible framework of resolution for the problem of human semiotic dissonance, and as a means of overcoming our current ecological crisis.

Section 2

The Human Condition: Semiotic Dissonance

In this second section, we will be following an increasingly in-depth investigation into what it means to be human, beginning very broadly at first, from the perspective of embodied being and existence, and proceeding to a detailed consideration of what we term the human semiotic condition. In Chapter 4 we will be investigating the concept of freedom, as a functional definition of human freedom is required by the discussion we are presenting, as it is the possibility of human freedom and agency that both reflects the incoherency of mechanistic conceptions and provides us with grounds to advance the Peircian position later as we progress. In Chapter 5, we begin refining our exploration of what it means to be human by investigating the human *Umwelt*, introducing several complications involving differing perceptual modalities within nested levels of systems of complexity, presenting the human condition as myriads of nested systems within nested systems, where boundaries between levels become sites of biosemiotic activity, and where, as we will see, we can *never be certain where one ends and another begins*. In Chapter 6 we further refine our inquiry into what it means to be human in scrutinising the potency of metaphor, and the importance of what metaphors we adopt and what guiding principles we follow in the creation and adoption of these *metaphors we live by*. Finally in Chapter 7 we conclude this section with an investigation of the human condition as homo economicus. To this end, we will be making our case by arguing primarily against the contention of Per Bak that spontaneous critical systems are "How nature works" and that our economic systems reflect this same *mechanism*.

CHAPTER 4

Freedom as Dialectic

Fire is not able both to heat and not to heat, nor is anything else that is always actively realizing its ability.

-Aristotle (Logic, 1963: 158)

If nature is conceived as the original source of all self-creation, and mind and ideation are further taken as emergent from within, and as processes of, nature, and every process within nature conducts itself according to *thoroughgoing restriction* and *constraint*, where does that leave the metaphysical concept of freedom? Put simply, freedom is creative *play within* constraints. Indeed, constraints make freedom possible. Human freedoms emerge from and with human culture, the latter emergent from human mind, which as we have contended thus far may be considered as developmentally emergent from nature. Human mind and culture, among other things, may be treated as a means by which nature generates the emergence of freedom, and freedom can therefore not be considered anterior to human culture, but only emergent from it.

Free to play

The constraints from within which generative freedom becomes possible can be appreciated homologously with the creative play of games. If we were to be playing some sort of game, the most basic boundaries or constraints of that free play must be (even tacitly) agreed upon and known by all parties involved. Acting outside of those agreed constraints would violate the game itself; for example if we were playing a game of chess and the conventions of the game were completely ignored by one player, it would make the game unplayable. If, however, it was agreed by all participants that, for instance, all conventional formalities of the game of chess were removed, and any piece could move in any way that anyone wished, the game would continue to be a game of free play (if perhaps, no longer a game of chess), as long as the constraints were reciprocally agreed upon.

Freedom, as an umbrella concept, will be one of the more involved topics within this discussion, and needs to be unravelled slowly and methodically. To this end, we will be working toward an understanding of the essence of freedom as nature's creativity – hierarchically organised causation in which hierarchical systems of constraints produce new emergent levels of hierarchical systemic constraints – emergence of further capacity for emergence. It will also be necessary to look at what freedom *is not*, or what is at times taken to be freedom, and at how these missteps in logic or definition occur.

Linguistically, freedom can be considered in several different ways. On one hand it can be considered adjectivally, in describing something as having the qualities of or associated with freedom. This is problematic due to the perspectival nature of those qualities. By this definition, a slave might be considered free insofar as a perfectly contented slave is perfectly free to realise all of their desires. From another perspective, freedom might be considered as a noun – a state or condition of being – but this reification may also be problematic due to the contextual nature of the concept of freedom itself. Finally, freedom can be considered a verb, a doing of freedom – as freedoms *increase*, such as in the freeing which occurs in the act of artistic creation, making possible new forms or new aesthetics; and it is possibly best considered in these terms, as the creation and exercise of freedom – though we must remember that it can also partly be understood as adjective and noun.

Degrees of freedom

Freedom is also seldom an either/or affair, and it may be beneficial to consider things in terms of degrees of freedom, or perhaps dimensions of change and variability. Contained within this conception of change and variability are various relations to probability theory, including randomness and stochastic predictability. This is because, mathematically and syllogistically, freedom can be conceived as inconsistent with, and hostile to, determinism.

In scientific and mathematical modeling, a non-deterministic system in which subsequent states of the system can be determined probabilistically is a stochastic one. A deterministic system, on the other hand, is one in which no randomness can be involved in subsequent states of the system, and is predictable (at least in principle) in the scientific and mathematical sense, and can provide us with laws and formulae of physics and mathematics. Even when variables are taken into account and precise system states may be difficult to distinguish, deterministic systems are always capable of being represented by a differential equation of some sort. An example of this might be that water boils at one hundred degrees centigrade. Of course, there are a number of other variables which can affect this result, such as the salinity of the water and the elevation in relation to sea level (or, more accurately, the air pressure acting upon the water). All of these variables, however, can be included into the differential equation describing the deterministic system in question. Stochastic systems, by comparison, are ones in which the randomness of future or subsequent states can be determined probabilistically rather than through linear differential equating.

Widely used in atomic clocks, and in industrial and medical gauges due to the predictability of its specific frequency on the emission spectrum, caesium-133 is a very soft, mildly toxic radioactive chemical element (Cs, atomic number 55) that is one of the five metal elements that are liquid at room temperatures, and explode instantly on contact with water. In nuclear chemistry, it is understood to undergo exponential radioactive decay at a probabilistic rate of a thirty-year half-life period (Haynes, William M., ed. (2011), *CRC Handbook of Chemistry and Physics,* 92nd edn.). Half-life is used to describe the radioactive decay of any elements with unstable nuclei, and is not a linear equation, but a probabilistic one that represents the time it takes for half of the atoms to undergo radioactive decay, and the probability of a radioactive element decaying during its half-life period is 50%. In this, the probabilistic nature of the equation is only ever an approximate expected value, such as in the case of flipping a coin a given number of times and expecting roughly half of the results to come up heads. In this example, various degrees of freedom – understood as dimensions of change or variability – are present. The radioactive decay of unstable atoms in caesuim-133 is stochastically predictable, but the actual moment of radioactive decay of an unstable nucleus is in fact random within those given constraints. Human freedom is, expectedly, far more complex than this, and perhaps the idea of "degrees of freedom" as employed by the physical sciences is best understood as a metaphoric concept, based in cultural understandings of freedom.

It is a tradition of philosophy going back to Aristotle to argue syllogistically, which often leads to conclusions of a false dichotomy, such as that between free will and determinism. Aristotle's classical reasoning employs categorical modal syllogisms (enthymemes) such as the principle of logical identity that *A=A or A is not non-A*, (*Prior Analytics*) by which modal inference we are left with an irremediable dichotomy between freedom and determinism. *Either* free will exists, *or* preconditions exist for everything and there can be no other possible outcome. However, as we will attempt to show in this and subsequent chapters, through a Hegelian method of dialectical thinking, a dissolution of the dichotomy between free will and determinism may be found whereby freedom is not conceived as the contrary to determinism, but is rather dependent on and emergent from constraint.

Discrete impossibilities, modal logic of subjunctive possibility

Human freedom has much more to do with what is possible than what is probable, and what is possible is so because it is not in any way impossible. There are two very distinct types of impossibility to consider here: logical impossibility, and contingent or conditional impossibility. There are also several types of subjunctive modal possibility we will need to examine and contrast: logical possibility, metaphysical possibility, natural or nomological possibility, as well as temporal or historical possibility, and of course, necessity.

Beginning with the impossible, we have the categories of logically impossible and contingently impossible. A logically impossible subjunctive modality or proposition is one that involves a logical contradiction. In most cases, this is a violation of definition or logical contradiction or paradox within a statement or subjunctive proposition, such as might be found in "married bachelor" or "round square," where the definition inherent in a term is undermined by oxymoron or paradox. Within these examples, a bachelor cannot be married, as the definition of bachelor is to be unmarried, and the definition of married entails no longer being a bachelor. A square cannot be round by definition, nor can any round object be a square. A logical impossibility is a formal contradiction, and is distinct from a contingent impossibility.

A contingent impossibility is one which we might normally consider to be impossible, but does not contain a logical contradiction, such as a proposition which involves a violation of universal physical laws. It is contingently impossible for an apple to fall from the ground up to the branch of a tree, but it is not logically impossible (if we broaden the definition of the term "fall" beyond an accepted directionality subject to gravity, as something might be imagined to fall in space without the gravity of planetary bodies to affect it). It may be possible for the physical laws of the universe to be different from what they actually are or are accepted to be – such laws are contingencies from the perspective of modal logic. It is not logically impossible for me to be able to physically jump between continents, as I can do so in my dreams, but it is certainly contingently impossible for me to do so outside of dreaming. Dreaming offers a uniquely accessible perspective on these different modes of possibility, for as one is within a dream-state, impossibilities often seem possible, and internal logic seldom questions this impossible-made-possible, but continues along with the oneiric narrative, accepting the alternative physical laws as they are found to apply rather than as they have always been found to be when not in a dream-state. In this there is also a curious confrontation between experience and mere thought, as what I experience in my dreams has the character of experience while remaining entirely thought. In waking life I can think about or cognise drinking a cup of coffee, which is quite different from the experience of drinking a cup of coffee. Within a dream, however, I can experience the experience of drinking a cup of coffee entirely as a product of my mind thinking (dreaming) of drinking a cup of coffee.

A logical possibility is a proposition which contains no logical contradiction which would preclude its being true. The logically possible can be factually incorrect without being logically impossible. "A pig can fly" is a logically possible proposition – it may be factually false, but does not contain a logical contradiction insofar as one is able to conceive of a situation or contingency in which it may in fact be possible for a pig to fly. A logical possibility is the most inclusive subjunctive possibility of modal logic and is not bound by the strict burdens of proof of other subjunctive possibilities.

Related to this is a metaphysical possibility. A metaphysical possibility is more restricted than a logical possibility, though can correspond to it. Every logical possibility is derivable a priori, whereas there (arguably) exist metaphysical possibilities that are not derived a priori (For more on this, see Saul Kripke (1980) *Naming and Necessity*, specifically his 'theory of naming,' pp 64-71). The distinction between logical necessity and metaphysical necessity will be further unravelled as our discussion progresses, but it is enough to note here that a metaphysically possible subjunctive proposition is one that is not only logically possible (and so fulfils the criterion of logical possibility), but also does not violate the laws of metaphysics, though it can, however, be non-factual or non-actual.

Even more restrictive is natural or nomological possibility, which describes that which is actually possible according to the actual laws of nature. This type of possibility can be problematic for a number of reasons. Taking, as example, the possibility of a pig flying, there is really no reason nomologically why this could not become possible. We have no difficulty in imagining a flying bird, which evolved to do so over millions of years, and evolved from reptiles – there is no reason to imagine that given enough generational time and the appropriate evolutionary conditions that suidae would be ill-equipped to eventually develop the capacity to fly (or even learn to paraglide). Similarly, Hume, Meillassoux, and others suggest that the laws of nature as we encounter them in our reality are merely contingent, and could in fact be quite different than they are. If the laws of nature are taken to be so necessarily, however, nomological or natural possibility *is* metaphysical possibility, and so does not deserve its own category in this sense.

Finally we have historical or temporal possibility, which refers to the actual history of the world and reality. There is a sense in which once something has occurred, it cannot *not* be so, as it has already happened. A way to understand this is in terms of the choices we make in our lives and reflection upon them nostalgically; as a child I had nigh infinite possibilities available to me – it was possible for me to become a philosopher or an economist or a bearded lady in a travelling circus. When I returned to study over a decade ago, it was possible for me to choose to study philosophy or economics, though now that I have studied philosophy, it is not possible for me to *have* studied economics, given that the past has unfolded as it has, and has already occurred. I could, of course, always choose to now study economics, but it is not possible historically for me to have studied economics, or even to have not studied philosophy. In this, historical / temporal possibility is obviously subject to nomological and contingent possibility, as it assumes sequential temporality in natural laws (whether contingently or necessarily).

Human Freedom

To understand human freedom in light of all of these various types of possibility and impossibility is actually simpler than it might first appear. Human freedom is cardinally bound by logical possibility, in that we have no freedom to do the logically impossible. We have, for instance, no freedom to both be and not be simultaneously, or any other act the description of which is self-contradictory. No man is free to become a married bachelor, nor free to create a circular square (though we have the freedom to imagine such impossible objects). Contingently, we have no freedom to do the contingently impossible. While subject to the contingency of waking life and natural physical laws, I am never free to circumvent those natural physical laws by, for example, jumping physically between continents as might be regular in my dreams. I am, of course, free to dream I am doing so, or fantasise I can do so, but not to physically do so in the physical world. We may logically have the freedom to do the contingently impossible, such as my freedom in my dreams to jump between continents, but I am not free to do so outside the contingency of dreaming.

The possibility of human action falls into three categories: What is required or demanded, what is prohibited, and what is permissible. All of these categories fall within the boundaries of what is possible, according to the aforementioned modes of subjunctive possibility. That which is required or demanded might be considered necessary, though there obviously exist required actions which are not deterministically necessary, such as those required actions which might fall in the sphere of morality and value theory. Additionally, within morality and value theory there exists a fourth category of the *supererogatory* – that which goes above and beyond any demanded action (but in the same direction). The possible but not necessary (deterministically or otherwise, in terms of morally required or demanded action) again falls into two categories, the permissible and impermissible, both of which might be considered varieties of freedom. Freedom, as we will now examine, might best be conceived through its dialectical character – that is, not simply as free or unfree, but as varieties of freedom which emerge culturally – these varieties of freedom are interdependent and irreducible to one another and simultaneously unfathomable without reference and comparison to the other categories in the trichotomy.

Varieties of freedom, the dialectical character of freedoms

The first distinction which we can make here is that of the difference between *freedoms-of*, *freedoms-to*, and *freedoms-from*. On the surface, the choice to make these distinctions may seem somewhat arbitrary – and the terms themselves are placeholders to advance the discussion. In this sense the terminology matters less than the categories represented by these distinctions. These proposed categories of freedom are interdependent, emerge together from cultural grounds, and cannot be reduced to one another.

The category of ***freedoms-of*** describes the culturally constituted and culturally enabled permissibilities and legitimations of free actions, behaviours, and choices. *Freedoms-of* can be understood as cultural constraints on, and constitutional conditions for *freedoms-to*, legitimating and making possible sub-ranges of *freedoms-to*, and in the process of doing so delegitimating their impairment. Examples of *freedoms-of* might be found in the culturally established freedoms of thought, speech, association, worship and the like.

Freedoms-to are culturally constituted capacities, abilities, capabilities and potentials. *Freedoms-to* are constrained and established by *freedoms-of*, and are what provide the *freedoms-of* their purpose. *Freedoms-to* are creative and productive – freedoms to contribute to culture and to establish and produce one's own life *as* culture.

Freedoms-from encapsulate the culturally provided grounds by which the possibilities of *freedoms-of* and *freedoms-to* may be realised. *Freedoms-from* incorporate the cultural constraints on circumstances which could inhibit the possibilities, and prevent or restrict the emergence of *freedoms-of* and *freedoms-to*. *Freedoms-from* are culturally instituted and culturally legitimated advantages. A great many *freedoms-from* are today thought of as rights (such as freedom from hunger, oppression, enslavement, slavery, and the like), though some *freedoms-from* are perhaps better conceived as cultural privileges, such as freedom from the need to earn a living or the freedom to drive a car.

This dialectical character of freedom may be conceived hierarchically, such that *freedoms-from* provide the culturally constituted grounds by which *freedoms-of* can generate the hierarchically emergent cultural constraints which in turn provide the grounds for the possible realizations of *freedoms-to*.

Freedom- of is self-limiting and closed ended, whereas *freedom-to* is additive and open ended. An understanding of this in one sphere might be the example of 'freedom of speech.' To speak freely is never entirely to do so, and is always context dependent. The limits of our free speech are always defined according to where that speech is taking place, and with whom. One example is that one may have freedom of speech, but not the freedom to yell "fire" in a crowded theatre. Another example can be found in the case of Chelsea Manning, who shared information with the world which she was not deemed free to share, and has lost her physical and other freedoms as a result. *Freedoms-of* are self-limiting in the sense of this context dependency, whereas the *freedom-to* speak is limited only by ability to do so. This might be understood in terms of learning a new language (or a first language in the case of a young child). Initially, that freedom to speak will be limited to the vocabulary and syntax known to and understood by the individual, and their ability to express increases exponentially as more is understood about the language being used. The case of a young child learning their primary tongue brings up an impasse that occurs when these two types of freedom collide; as the child gains greater mastery over their given language, there is bound to be an occasion in which that child learns (contextually) inappropriate words for a child to voice, and as is natural in children, they are likely to repeat those words without understanding the profane nature of the words they speak. A child who hears a curse word is likely to repeat it in the most inappropriate circumstance without even being aware of what they are saying. In most cases this will result in some sort of rebuke or punishment that will at first come as a surprise to the child, having no understanding of the word they are using. In this, the child's *freedoms-to* increase with their vocabulary and ability to employ all the words they come across are unimpeded, but their *freedoms-of* speech and usage are curtailed by those around them, who would seek to keep a young child from swearing. Language itself provides a *freedom-from* dissociation, as the process of learning a language entails interaction with and acquirement of culture with the structures of vocabulary and syntax etc.; language providing the culturally constituted or provided grounds of possibility of human communication.

Freedoms-of are current circumstances – socio-cultural contexts for *freedoms-to*, whereas *freedoms- to* are the category of processes of becoming and emergence. *Freedom-of* is a realised or realisable quantity, and while it might not always be known, it is at least knowable. A foothold to understanding this might be found with reference to technology and technological development. What is possible with current technologies is largely understood; the personal computer, for example. New software programs are always being developed, but are still constrained by the limits of technological capacities, and how those technologies are culturally employed. The extent to which personal computing technologies have been integrated with human life and culture today would have been largely unknown two decades ago. Likewise, how this technology will be culturally incorporated in another twenty years, and what form personal computing technology will even take, is a realm of extreme speculation. Without getting too far off topic, this analogy offers an accessible perspective on the concept of emergence, and how that relates to the resultant possibilities of freedom. The *limits* of *freedoms-to* are unknown and unknowable, never static, and are perpetually in process. *Freedoms-of*, on the other hand, are in one respect static, though that value is regularly "updated" as the associated value of *freedoms-to* develops with and past it. Understood biologically, there are eight primary taxonomic ranks of biological classification; species, genus, family, order, class, phylum, kingdom, domain, and life. Within an individual life, the possibility for (or *freedom-of*) emergence is quite specifically limited in developmental terms, but it is variations in individual lives which, over time and through selection, create new variants among entire species (*freedoms-to*).

Positive and Negative liberty

It is necessary to consider the concept of freedom briefly in terms of the Platonic (and Kantian) distinction of positive and negative liberty as they relate to the overall concept of freedom. *Freedoms-of*, in Platonic terms, is negative liberty, existing in the absence of constraints specifically related to some end or action, whereas *freedoms-to*, in Platonic terms, is synonymous with positive liberty, existing in the possibility of acting toward a purpose. However, this is still a hotly debated distinction. Isaiah Berlin (1958, 1969), in following a tradition that leads back through Kant to Plato, made the distinction between positive and negative liberty, where negative liberty is conceived as the absence of external restrictions or obstacles stopping someone from acting in a certain manner. Being free from physical containment, for example, is the negative liberty to move about freely. Positive liberty, on the other hand, is the freedom to be self-determined – the freedom to realise one's own motivations and ultimately to craft one's own destiny. In this distinction, the greatest line drawn between the two definitions of liberty is the origin of restrictions on a given agent, whether they be external restrictions (relating to negative liberty), or they be factors internal to the agent (relating to positive liberty).

This is both Kantian and Platonic insofar as both thinkers felt a great distinction between what we can call the higher and lower selves – the higher self being the self-reflexive and rational maker of decisions, the lower self being the impassioned, impulsive unreflecting and irrational self. Kant's entire philosophy hinged on the existence of this higher self as ultimately within all humankind, and what makes us special within the cosmos.[1]

[1] The slippery slope presents itself (in political philosophy terms) when it is proposed or accepted that some individuals are more capable of rationality than others, leading to authoritarianism within appeals to liberty. This is, in fact, the spirit behind most representative democracy, with the elected 'more rational' individuals granted the right to restrict the liberty of others toward the end of liberating them from their less rational passions and desires. The obvious danger in this is the pitfall of paternalism, authoritarianism, and ultimately slavery which can result. This also raises an issue which we will be

Freedoms-of are collective and concern environment and context, in the sense that they relate to that outside the individual (individual person, process, or even atom), and how that relation is mediated to larger external processes. *Freedoms-to*, on the other hand, are more autonomous, as they relate to processes of becoming (of individual agents, processes, and even atoms), and how those processes emerge and develop. Negative liberty, as defined above, concerns itself more with the external sphere from a collective perspective, with the promotion of negative liberty – in theory – simultaneously promoting the possibility of positive liberty within each individual, with the proviso or constraint that the positive liberty of one does not diminish or restrict that of another. This highlights a central concept of the dialectic of freedom – that the dialectic of freedom, as all dialectics, can more appropriately be conceived in triadic terms. In order to do this, we must return to a concept mentioned earlier – that of *freedoms-from*. This triadic understanding of liberty was put forward in the late 1960s (primarily by political philosophers Felix Oppenheim and Gerald MacCallum), as a means of unifying the two concepts of positive and negative liberty under a single (triadic) concept of liberty, or freedom, which saw the question of freedom as regarding an agent, what that agent is free from, and what that agent is free to do or to become. In each of these three aspects, both positive and negative questions of liberty can be posed for any given example. In this, a dialectical process is entered into whereby the dichotomy between positive and negative liberty might be overcome, a similar process to that which we are proposing as a means of moving past the dichotomy of freedom and determinism as has existed within philosophy going back to the syllogistic logic of Aristotle.

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turning our attention to shortly – namely sensitivity and valuing. This also related to the next distinction which needs expansion – that of freedom at the individual and collective levels.

A dialectical dissolution of a dichotomy

If, as has been proposed thus far, freedom and free will are hierarchically emergent from a dialectical process of causal and cultural constraints, then free will should not be understood as the negative or inverse of determinism as has traditionally been the boundary of the classical argument. Free will would not then be the contrary to determinism, as the applicable causal concept is not determinism, but rather constraint, and the emergence of freedom is constitutionally dependent upon hierarchically organised emergent levels and processes of constraint. Freedom understood within the framework of categories of freedom which are interdependent and cannot simply be reduced to one another offers a different perspective on the dichotomy proposed between free will and determinism. It is a tradition in philosophy, going back to Aristotle, to argue syllogistically, which can tend toward conclusions of false dichotomies, such as that between free will and determinism. *Either* free will exists, *or* preconditions exist for everything and there can be no other possible outcome. However, through the proposed dialectic, a dissolution of the dichotomy of free will and determinism may be found whereby freedom is not considered as the contrary to determinism, but rather of constraint; freedom itself being dependent on and emergent from constraint.

In his *Lectures on Aesthetics* (Part III), Hegel characterises the "yearning of the spirit" as developing itself toward freedom. This is an absolute freedom of thought and creativity, and not specifically the freedom to act, as an absolute freedom in action would result in making both the act and the freedom to act meaningless. Freedom holds a dialogical tension with itself insofar as every action has outside consequences, and has meaning only within a context of those consequences.

Sensitivity, Valuing and Habituation

For even the simplest, least complex forms of life and sentience, sensitivity to conditions is a primary necessity and prerequisite to any self-preserving work. Prokaryotic bacteria (bacteria with no nucleus and the simplest cellular structure of life on this planet) require the ability to be sensitive to conditions relevant to their maintenance and reproduction, such as temperature and salinity. Even at this most basic level of cellular organization, it is necessary that an organism have the capacity to be sensitive to the conditions which will either aid or impede its survival and development, and it is only with this sensitivity to conditions that the ability to value certain conditions over others becomes possible. As noted by Deacon (2011: 568), even simple bacteria have qualities which qualify them as "selves" insofar as their functions and adaptations are defined as "existing *for* the persistence of this individuation or else its reproduction," but as is inherent in that definition, such selfhood is contingent on functioning towards persistence and/or reproduction. This sensitivity to conditions and the resultant valuing of some conditions over others is therefore a requirement not only for the continuance of an organism, but for being an agent which is capable of being considered free or unfree. Without developed sensitivity to conditions, and the ability to value appropriate conditions through that sensitivity, any organism – from prokaryotic bacteria to human being – cannot be said to be autonomous or capable of freedom in any sense. This is particularly concerning for any instances in which that sensitivity can be diminished or removed through any form of conditioning or exposure.

In contemporary human life and culture, we are daily exposed to particular chemical compounds which are detrimental to our own continued longevity and health, and our natural sensitivity to this detriment is diminished through continued exposure and conditioning. The combustion of carbon-based chemicals found in coal, diesel, gasoline and the like produces noxious by-products such as carbon monoxide and hydrocarbons, as well as large amounts of less toxic but still undesirable (from the perspective of the continuance and maintenance of organic life) nitrogen and excessive carbon dioxide. The natural sensitivities we are equipped with as a species result in a physical revulsion to the scents made by combustion of those hydrocarbons, encouraging us to seek "fresh air" and not to continue to breathe such "bad air." We are, however, conditioned to the contrary by contemporary society through the organisation of transport and the particular technologies we use, to become accustomed to inhaling such fumes, and many people sit every day in traffic for hours becoming more and more conditioned, and resultantly less and less sensitive to such exposure and its possible consequences.

Similarly with sugars, through mass exposure in many products of daily life we have become conditioned to ignore the sensitivity we have developed as a species. Humans have evolved as seasonal hunter and gatherers, and have developed physiologies to aid us through long winters of little food, by efficiently storing energy from sugars as fat. Our modern lifestyles, however, contrast sharply with this history, and we require very little expenditure of energy to acquire food compared to that required to gather, hunt and kill for survival. Further, the structures of our society mean we are seldom left wanting for nourishment in the first world, unless actively seeking to do so through dieting and restricting caloric intake. As a result, we are facing an obesity and health crisis in many countries in the first world simply from over-consumption due to the huge levels of energy (in the form of fats and sugars) in much of the food we consume, and the diminished energy requirements for much of the work we do.

The paradox of sensitivity comes in a strange fashion; for, in many cases, specific sensitivities need to be overcome in order to become and to grow. One simple example of this is evident in the sensation of pain. In order to grow, it is necessary for muscle fibres to physically rip and rebuild themselves. Even in the process of learning to walk, a child goes through growing pains as their skeletal structure and musculature grows and adapts itself to the task of being able to support bipedal movement. To become physically stronger, it is necessary to stress the current capabilities of the muscles in order that they repair themselves and grow stronger. This process is accompanied by physical pain, the body's signifier that some damage has occurred and further stress of this specific type should be avoided until the body has had sufficient time to repair itself. Similarly with the immune system; in order to build up resistance and immunities to things which may compromise it, exposure to the latter is required. In any case where the capacities and tolerances of the organism are being improved upon, it requires the pushing of the boundaries of sensitivity. This is a strange paradox, and one particularly evident in the effects of modern life upon the human physiology and psyche.

This raises an interesting facet of sensitivity and the altering of valuation through the conditioning processes of habituation and addiction. Both mentally and physically, organisms are conditioned through exposure. This is as true of substances as it is of exercise. The process of habituation is the repeated exposure to some sort of eliciting stimulus which leads to a decrease in response to that stimulus, the opposite of sensitisation, in which repeated exposure to a given stimulus leads to an increased response. While all cognitive learning is a process of sensitisation, the two concepts are intimately linked in how they affect the mind and body. One example might be found in how the body responds to repeated actions of varying sorts – if one were to commit several hours a day to working and stressing a select group of muscles it would have varying levels of sensitisation and desensitisation according to how those exercises were conducted.[2]

There are therefore two elements to the reduction of sensitivity – a mental element that includes habituation and (classical and operant) conditioning, and a physical element that may involve or become dependency and addiction. In this, for humans, the physical elements of dependency and addiction are less effective at altering the valuing from sensitivity than the mental elements. An example of this might be found in a smoker or drug addict, who still values health and is aware of how their behaviours are ultimately detrimental, but continues such behaviours due to physiological compulsions. What is more detrimental than this example is the habituation and mental conditionings associated, which far more effectively target and alter the valuation process. As complex cognitive creatures, we are extraordinarily susceptible to this mental conditioning – far

[2] Playing an instrument, guitar for instance, is a mutual process of sensitization and desensitization – as one begins the process of learning the instrument, the muscles of the hands are not particularly responsive to the shapes and positioning required, the fingertips are not calloused and the strings of the instrument dig deeply into the skin, causing pain and frustration. As the process is repeated day after day, however, sensitivity to the pain diminishes as calluses develop in appropriate places. The muscles of the hand become more accustomed to the shapes and positions required, and eventually, muscle memory takes over for most tasks, the hands responding almost automatically to mental intentions without the need to look at the frets on the neck of the instrument to find the placement to create familiar chords. Similarly in the case of lifting weights to improve the physique, as the same muscle groups are stressed over time and repetition, it requires increasingly heavier weights or repetitions to continue to build the muscle tissue. The same is true in many cases of substance exposure. For substances that elicit a physiological response (whether immediate or not), such as alcohol or caffeine, a process of desensitization occurs, where increasingly more of the substance is required to achieve the same level of response. In all of these cases there is also a simultaneous process of habituation that occurs alongside the conditioning associated with sensitization and desensitization. If one were to practice guitar for an hour every day for an extended period, in addition to improving at the act of playing guitar, a mental conditioning would occur in the form of habituation. Quite similarly with caffeine, if one were to indulge in a cup of coffee every morning, the body would become increasingly less sensitive to the effects of the caffeine, and may begin to crave coffee and its effects in the morning.

more so than any simpler life-form, for which the physical conditioning would be more effective at altering the valuation of conditions.[3]

Habituation and associated mental conditionings are more effective in their targeting of valuation processes due to the reliance of those valuation processes on mechanisms and procedures of *evaluation*. Without developed sensitivity to conditions, and the ability to value appropriate conditions through that sensitivity, no organism can be recognised as autonomous or capable of freedom in any sense. While all simple organisms which qualify for "selfhood" develop sensitivities to conditions which establish capacities to value some conditions over others as conducive to their maintenance and reproduction (as such selfhood is contingent on functioning toward), as levels of complexity increase and mind becomes an emergent factor, these determinations become concurrently more complex, with mind itself advancing valuation processes into complex cognitive processes of *evaluation*. It is these very complex deliberative processes, capable of being mentally conditioned or influenced, which allow for the possibility of the valuation processes of minded beings to be influenced in far more effective ways than simpler physical conditionings. The possibility of these physical conditionings remain

[3] A way to understand this might be through larger socialised values as they have changed over the course of time; reception of and attitudes toward both smoking and alcohol in different cultures highlight this example. As recently as thirty years ago, smoking was far more acceptable and ubiquitous in our society – even in enclosed spaces such as elevators and airplanes. The long-term effects of smoking were largely kept from the public, and the tobacco industry has long worked to undermine and suppress scientific evidence of the harm caused by tobacco products, both to the user and those passively exposed to the products. The physical dependency and addictive nature of the products have not changed, but the mental habituation and conditioning associated has changed and we now have many restrictive laws specifically regarding tobacco products, where and how they can be advertised and consumed, and the communal socialised valuation of the products has changed accordingly. Similarly in the case of alcohol, as observed in the varying social perceptions and valuations of it by indigenous and non-indigenous communities and cultures. The root cause of social and other problems caused by use of alcohol and other drugs in indigenous cultures is not a difference in the physical effects or sensitivities on these populations, but the associated socialised valuation – how it is perceived and where value is attributed (Saggers, Grey 1998).

present in minded beings, in the manners we have outlined already, where exposure to stimuli have the capacity to increase or decrease sensitization, but a new emergent level of conditioning develops in addition to this whereby cognitive deliberation becomes an integrated element in the process of valuing.

Why did the chicken cross the road?

It is undeniably a capacity of mind to transcend physical compulsions or inclinations. The physical stimulus-response mechanism occurs *in the moment* and is not so much a deliberative act, such as the muscles responding in contraction to automatically remove a hand from a flame, and this is analogous to the response to sensitivities which influence the behaviors of prokaryotic bacteria within their environments. The deliberative evaluative processes of mind, by contrast, operate *in time*, with a chronological awareness of future states. Actions are decided upon deliberatively rather than responsively and to some degree take into account future states, intentions, or goals and how to achieve them: an absential quality to be realised (Deacon, 2011). If physical inclinations and sensitivity derived evaluative responses are *reacting to*, then their mental deliberative and evaluative counterparts are *inclining towards* something, which requires a knowledge or belief in some future state or set of conditions to be *inclined towards*.

Without engaging with any of the numerous punch lines, this inclination towards possible future states is inherent in the jocular idiom of *why did the chicken cross the road*. The potential for comedy is far less prevalent when the same question is proposed on a scale of far less complexity, and answered far more readily: Why did the prokaryotic bacteria move in a given direction? Because the conditions in that region were more conducive to its persistence or reproduction than in the region from whence it came. In the case of the minded chicken, however, there is a deliberative evaluative potential in its action of crossing the road, and the choice to do so contains innumerable variables – ultimately pertaining to the persistence or reproduction of the chicken, but with inclination toward possible future states rather than merely in the moment when the choice was made and the action occurred. Having a mind entails that the chicken can *learn* a complexity of sign-signifier relations which can suggest variants in possible future states as they relate to the minded chicken and its *Umwelt* (on *Umwelt*, see Sebeok: 1976, Kull: 1998, Uexküll: 1957, 1987, which we will be examining in great detail in the next chapter). The act of crossing a road, which by definition is not meant or designed for poultry, has the potential to prove quite detrimental to the persistence of the chicken, but its inclination toward a future state – beyond the time of being on and crossing the road – has the potential to direct its action to do so regardless of the possible dangers.

While variations on the answer or punch line to the anti-humor riddle are close to limitless, analytically there are really only two categories of answer as to why the chicken might have crossed the road; either it freely chose to do so, or it did not freely choose to do so. There is, of course, a great multitude of reasons which fall into one or the other category.

To begin with, it would appear relatively uncomplicated to identify those instances where free choice was not a contributing factor in the given action: whether through some sort of physical force or compulsion, or any external intervention or influence. Under these conditions there exist no grounds to suggest the action was freely undertaken or the choice to do so made freely, and there are innumerable examples we could come up with to fit such criteria. It is in the inverse, in identifying examples of purely free choice for actions, that our investigative example becomes troublesome. What, on the surface might appear to be a choice made freely by a minded being may in many instances be unraveled to include numerous types of influence which would prove problematic for categorization as free decision making. The capacity to learn a complexity of sign-signifier relations (the semiosis relevant to its own *Umwelt*) allows for those relational interpretations to be manipulated at several possible levels or stages – at the source of their production, through the medium of their communication, at the point of their reception, and at the level of their interpretation.

We could employ another common idiom (and metaphor) to explain this: that the "grass was greener" on the other side of the road. This is, of course, operating on the assumption that grass is a possible or even preferred food source for our given chicken, in which case crossing the road in order to get to the source of food would be more conductive to its persistence. The *green* of the grass is a semiotic signifier of healthy nourishment, and a relation that would be familiar to all ground dwelling herbivores. Other colours signify different things – red is often associated with danger, brown with drought. A manipulation of this at the source of the production of semiosis might, again, occur for any number of reasons. In the natural biosphere, a fungus or other plant might mimic this quality of *greenness* in effort to attract a herbivore as a means of disseminating its spores or seeds – as a means of furthering its own maintenance or reproduction. In the semiosphere as we find it (with the assumedly man-made road included), a human resident may have covered an area surrounding their own dwelling with Astroturf or similar, appearing for all purposes from a distance as very green grass, with the reception of that semiotically by herbivores being intentional (possibly for the purposes of attracting fauna to the area) or completely unintentional (such as in the case of waste plastics finding their way into the oceans and being mistaken by sea life to be food and eaten). In this we observe how complex human agency can come to interact with and influence the semiotic *Umwelt* of lower levels of complexity within nature by sharing semiotic relations or similarities with established sign-signifier relationships.

The above examples are variously manipulations on the relational interpretations of sign-signifier relationships at both the source of their production and through the medium of their communication, as both of these levels or stages of semiosis occur independently of the receiver and interpreter of those signs. The third level of *Umwelt* specific semiotic interaction occurs at the point of reception, and is also open to its own levels of manipulation. The semiotically receptive capacities of the chicken (in our example) are biologically as well as experientially conditioned – that is, they are resultant of both biological capacities and conditioned experience through learning. Biologically, the chicken must have the physiological capacity to see and interpret *green* in such a way as relates to its own persistence or reproduction, and through experience and learning can it come to interpret the semiosis of this *greenness* as relevant (again, to its maintenance and/or reproduction). This level of semiotic reception is capable of manipulation or subversion both biologically and through experiential conditioning. Biologically, the ability to see something as *green* might be taken away or altered through organic damage or chemical exposure; retinal cones can become damaged, as could sections of the brain used for identifying or interpreting colour. This level of semiotic manipulation could also occur both unintentionally, such as through exposure to chemicals which would alter the process, or with intention, such as might occur if the ocular system was surgically manipulated or the brain surgically altered to remove the capacity to see or interpret colour, or to see everything as green.

Finally, the semiotic process may be manipulated at the level of interpretation. An example of this might be found in Pavlov's experiments in classical conditioning with dogs, where an additional level of introduced sign-signifier relation, or conditioned stimulus – in this case the ringing of a bell, is introduced between the unconditioned stimulus (foodstuffs) and the *Umwelt* derived unconditioned response (in this case, salivation for food). Similarly, a chicken might imaginably be conditioned to believe that the grass will only be edible if the road is crossed first. And again, at the level of interpretation, the semiotic relational interpretation could be manipulated both intentionally and without specific intention: conditioning of interpretation could occur in the manner of Pavlov's experiments, and it can also occur as a result of unintentional conditions being repeated. In each case, however, the conditioning is a result of a minded being *learning* something through repeated conditions which it then comes to associate as relevant to its own *Umwelt*, and which it then comes to annex with other sign-signifier relations.

In identifying these separate levels or stages of the semiotic process which are susceptible to manipulation or semiotic dissonance, the effort has been made to illustrate how all of these manipulations have the potential to occur both intentionally and without intention: both purposefully and as a result of random chance elements, or peripherally to some other intention. This distinction has been accentuated to emphasise the role of ethics in the semiotic process, an idea we will be returning to later.

Influencing valuation processes

It might be argued that nature – particularly at the level of inter-species competition for survival and resources – rewards strategies of deception. Whether functioning as a more efficient predator or less easy prey, examples of species which have developed strategies of deception to help them are almost countless; from predators which operate through stealth and camouflage to innumerable flora and fauna which present themselves as larger or more dangerous than they actually are, competition in nature is rarely if ever a "fair fight." In this, biosemiosis itself is utilised in a subverted manner to transmit messages dissonant with commonly encountered semiotic resonances, such as the use of "danger colours" to discourage the interest of potential predation, or in the case of predators to appear harmless or otherwise disguised to potential prey. At complex levels of social organization however, such as human communities, the value of deceptive strategies lessens in one sense (though it is certainly still prevalent), as the need to cooperate supersedes the requirement for competition. This is particularly true within family units, though arguably less so at the larger societal level, and communities which exhibit greater stability over time tend to develop strategies for minimizing deception and rewarding cooperative strategies.

In his treatise on how society should be structured, Plato (*The Republic*, 1955) examined the role he felt representation (in the form of art and poetry) should take within an ideal society, concerned that "such representations definitely harm the minds of their audiences, unless they're inoculated against them by knowing their real nature" (p 336). To demonstrate his point, he employed an analogy of a bed, explaining that it is in fact always three beds, and that "the artist's representation stands at third remove from reality" (p 339). For Plato, poetry and representation are hazardous specifically because they appear to us as something we can relate to, and something that may be trusted, when in fact, they should have no place in a properly run state because they "strengthen the lower elements in the mind to the detriment of reason" (p 348), the mental aspect of habituation and conditioning coming to influence the valuation process.

Our society is structured atomistically, with an emphasis on specialization and experts. When we are sick, we visit a doctor, who may refer us on to a specialist in whatever specific ailment is troubling us. Our treatment might consist of specialist surgery or the prescription of medications targeted at the ailment or malady. A specialist surgeon, however, is unlikely to be able to diagnose any problems with his car, and will instead seek the specialist knowledge of a mechanic. This entire system relies upon a basis of trust and cooperation that counters the strategies of deception found in nature and society. At this level of complexity within society and human technical capacity, it would be not only impractical, but impossible for a single individual to achieve the capacities and understanding of an expert in every separate specialist field that exists – that we must rely on the knowledge and abilities of others is a consequence of the complex nature of our society itself. We must be able to trust that strategies of deception motivated by self-interest are somehow curtailed by checks and balances within societies, and to a significant extent these checks and balances do exist in a vast majority of specializations. A physician is answerable to the department of health that sanctions his or her practice of medicine, and a mechanic is accountable to a Bureau of Automotive Repair or other authority (the Better Business Bureau, or other sanctioned authorities). These checks and balances are primarily fiduciary in nature, and are enforced through fines or the revoking of the rights to trade or operate in that specialization. Additionally, in a society there is a further social element of reward for honesty and cooperative strategies over deceptive ones in the form of social prestige and reputation. Cooperative strategies can potentially produce far more prosperity than any individual efforts, and as argued by Nowak (2011), our success as a species is owed to such cooperative strategies. The counterpoint to this, which Nowak investigates through the *Prisoner's Dilemma*, is that cooperative strategies imperil individuals to the potential for exploitation, which is predominantly a rewarding short-term strategy, and occasionally a winning long-term strategy.

Strategies of deception are nonetheless employed on a vast scale through marketing psychology to target and alter the sensitivity derived valuation processes of individuals, bringing up very serious questions regarding just how free it is possible for individuals to actually be, given that this sensitivity to conditions and the resultant valuing of some conditions over others is a requirement for not only the continuance of an organism, but the definition of an agent which is capable of being considered free or unfree.

Just as with the case of the Prisoner's Dilemma, there is an operant reciprocity underpinning human society and culture. The fact that humanity – human existence – requires community and thereby creates culture, necessitates ethics, and it is only within this context that ethics has any meaning. It is nonsensical to ask ethical questions of nature anterior to humanity, as ethics is a consequence of humans as cultural beings. Ethics must be conceived within the context of understanding and serving human nature and community, and so must consider the appropriate environment for that community. The underpinnings of moral thought and values as contextually human emerged as a by-product of the development of (particularly Ancient Greek) community, the conditions of which made possible the habitus for such conceptions. The introduction of Judeo-Christian ideals replaced contextual lifeworld human reason with a lawgiver god as the source of wisdom and the good. Later with the renaissance, theories of ethics came to be dominated by notions framed in terms of rights and obligations rather than motives and virtues. In order to serve humans as humans, ethics must primarily conceive of humans as fundamentally cultural beings, and must have the aim of creating the habitus and proper environment for flourishing human culture, community and thought – the essence of the possibility of human freedom.

The ethic of freedom

Aristotle's definition of virtue, seeking the right condition and appropriate activity for humankind, is couched in human lifeworld terms, as being "all the mean positions... between an excess and a deficiency, and in accordance with the right reasons" (1963, BK VI, pt1, p 344). In this, the merit of an action is determined only by direct reference to the full range of possible human action, which necessarily derives from a human context, and that human context being one naturally emergent from within Nature. The Hobbesian mechanistic conception of humans allows no referent to, or possibility for, an ethical conception of human living. As Gare writes, "In this scheme of things, customs, conventions and traditions" – and we could well add ethics to this list – "are of little significance unless they can be used to promote tourism or sell things... Hobbes' philosophy has reigned supreme" (*Narrative and Culture: The primordial role of narratives in human self-creation*, pp 4-5).

Just as we cannot understand geology without reference to the earth, or music without reference to sound, neither can we understand ethics without reference to the cultural human lifeworld, and that ethic must concern itself primarily with making possible freedom through human agency. For this to be at all possible requires an appropriately cooperative semiotic resonance, one which acknowledges the reciprocity of human culture. It is only from this fundamentally social understanding of the socially created identification within each individual of themselves as a subject among other subjects, that conditions are created for the possibility of human freedom. Individuals must be empowered to affect the processes of their own becoming by a reciprocal relationship with the public sphere which mirrors that of the relationship of the individual to the natural world from which they emerge, and these becoming processes can only be considered free insofar as the extent of their potentialities are free from semiotic dissonance and the various forms and levels of conditioning which can lead to such dissonance.

*

In this chapter, we have considered the possibility of human freedom, and have unravelled the essence of that human freedom to exist in a dialogical ethic of freedom, with a variety of human freedoms revealing their dialectical character and interdependence. We have found in this dissolution of dichotomy between free will and determinism entirely new grounds on which to consider the possibility of human freedom, simultaneously emergent from natural (bodily) sensitivity and (cognitive) valuation processes and the human cultural lifeworld (through the hierarchical interrelationship of *freedoms-*, culminating in and making possible the category of processes of becoming and emergence of *freedoms-to*). In the next chapter we be turning our attentions to what that the human semiosphere might look like in our effort to unravel what it means to be human.

CHAPTER 5

The human Umwelt

"Who are you*?" said the Caterpillar.*

This was not an encouraging opening for a conversation. Alice replied, rather shyly, "I – I hardly know, Sir, just at present – at least I know who I was *when I got up this morning, but I think I must have been changed several times since then."*

- Lewis Carroll, Alice's Adventures in Wonderland, V: Advice from a caterpillar

In preceding chapters, we first investigated prevailing definitions of and explanations for human mind and agency which have sought to either separate mind from Nature, or to subsume the phenomena of mind and human agency as a reductively mechanistic aspect of a mechanical nature. Finding these explanations deficient, we then sought to advance an emergentist conception of human mind and agency in which Nature is apprehended as the source of all self-creation, and all aspects of life, mind and ideation can be seen as emergent from within, and processes of Nature. Having further identified that the very possibility for human freedom depends on and emerges from culturally emergent constraints, with processes of becoming considered free only insofar as their potentialities are free of semiotic dissonance, and that agents are equipped with sensitivities to conditions which may affect their potentials, and means of valuation and/or evaluation of those conditions, the question remains what the subjective world of mind makes of *being in the world* it emerges from within.

Self-centred world

One of the major difficulties in idealism is the fact that the term refers to a variety of differing positions. Kant's transcendental idealism holds that human experience involves a necessary structural element. Metaphysical idealism, on the other hand, holds that ultimate reality *is* human experience and (human) mind. While idealism in some of its forms may tend toward a type of solipsism, Heidegger's position (in *Being and Time*) offers a different perspective on the problem by rendering any theoretical detachment from the world *itself* as illogical by insisting we are always already in the world, and we experience and encounter phenomena "ready-to-hand" (Zuhandenheit) - that we experience reality in contexts created by our involvement with them, and that reality is communal.

The term *Umwelt*, as used by Sebeok and Von Uexküll, adds a further dimension to this, referring to the foundations of signification that compose the world of personal experience, a "self-centred" world *within* the world of common, public experience. In effort to overcome the Cartesian divide, *Umwelt* theory proposes that mind and world are integral to one another - a functional circle whereby mind creates through the process of interpreting its world. The *Umwelt* is personal and self-centred to each individual mind(Uexküll, 1987: 147), though when more than one *Umwelten* (the plural of *Umwelt*) interact, a semiosphere is created[4]. This functional circle is the result of an interplay between the perceptual meaning and the operational meaning of an object for the subject, for whom any object which holds meaning for the subject presents in sequence as receptor and effector signs. As Uexküll writes; "the traits of an object are

[4] Uexküll did not use the term 'semiosphere' himself, instead originating with Juri Lotman in 1982 (published in 1984, 2005, 'On the Semiosphere,' *Sign Systems Studies*, 33 (1), 215 – 239.), and independently, again, by Jesper Hoffmeyer in 1996.

structurally interconnected, the traits given operational meaning must affect those bearing perceptual meaning through the object, and so change the object itself" (1934: 10). Any object in this regard, which presents as such for the subject, must hold functional significance (*Wirkmal*) for the inner world of the subject, presenting a quality of relevance - blue as blueness, green as greenness - which present as signs uniting for the subject the subject's own perceptual and motor fields.

Umwelt is entirely perceptual, and therefore personal and subjective. Among species, *Umwelten* can be considered as similar - and indeed, Uexküll's own *Theoretical Biology* scrutinises the minutia which compose the *Umwelt* of fauna according to species - though each individual creature within any given species must be understood as living within an *Umwelt* that "represents its own world, filled with perceptions which it alone knows" (1934: 5), entirely subjective and individual to each creature. This is not merely environment, but relationship with environment, and method of experiencing its own reality, each individual organism as a subject actively engaged in the creation of its own reality, "subjects whose essential activity consists of perceiving and acting" (p6).

This personal world of the subject-organism is one entirely composed of biosemiosis - of carriers of significance - unique to the individual, and at the expense of any other sign-signification relationships that exist extrinsically of its own *Umwelt*. It is Uexküll's position, which this thesis holds to be true, that all creatures correspond to their unique *Umwelten* comprehensively; that less complex organisms live within less complex worlds composed of a limited number of subject-object carriers of significance which comprise the whole of their subjective realities, while animals of greater complexity live within richer *Umwelten* which express far greater numbers of relations between subject and object - carriers of significance. "The *Umwelt* of any animal we wish to investigate is only a section carved out of the environment we see spread around it" (p13), and every animal or organism is uniquely adapted in its perceptual capacities and biological characteristics, and the relationship these hold to the character of things of relevance within their environments.

The study of the lifecycle of a tick reveals the simplicity of its *Umwelt*, it being a blind and deaf animal of relatively minimal complexity, and how the very modesty of its *Umwelt* tends to assure the integrity and continuance of its existence and reproduction. A tick lacks a great deal of sensory capacity that we as humans might take for granted, and is limited by its biology to its sense of smell and touch, as well as a sensitivity to temperature and light through its skin. Uexküll notes that experiments using fluids other than blood have determined that the tick lacks any sense of taste, and will consume any fluid of the appropriate temperature of 37 degrees, corresponding to the temperature of mammalian blood. The female tick hatches from its egg not yet fully developed, only capable of feeding from cold-blooded animals, the sustenance from which progresses her through several developmental stages where she gains her reproductive capacities and eventually mates, only after which does she pursue her final abundant meal of mammalian blood before laying her own eggs in the earth and dying. Piloted by the modest photosensitivity of her skin to the top of a blade of grass or tip of other flora, she perches at such a height as to be able to brush against or drop down onto a suitable host mammal, and there she can lie in wait for quite a considerable length of time. From here, the simplicity of her *Umwelt* allows her the greatest chance of being able to attain her necessary meal before laying her own eggs. Her world is reduced to only three carriers of significance; the odour of butyric acid given off by the follicles of mammals, the temperature of 37 degrees corresponding to mammalian blood, and the differentiation of a hairless spot on the host creature where she can burrow in and feed.

In the course of her fully developed life, no other stimuli hold any significance in the world of the tick. She is not only wholly oblivious to other qualities in her environment, but also to any other signifiers of her prey itself, "Out of the vast world which surrounds the tick, three stimuli shine forth from the dark like beacons, and serve as guides to lead her unerringly to her goal" (p 12). It is this very "poverty" of her *Umwelt* which best serves her life and reproduction, unburdened as it were by carriers of significance which might distract or confuse her from her single goal of reproducing and carrying on her genetic legacy and the survival of her lineage. This uniquely individual experience of her own world and environment extends beyond any characteristics of the environment that other organisms which share her greater semiosphere may regard as important, such as the blueness of the sky or the greenness of the grass, to the degree that her very relationship to time and space is unique to her.

The length of a moment

Uexküll proposes that the nature of perceived time can be divided into "moments," quantising the shortest period of time in which, for any given organism, the world can show no change; "For the duration of a moment, the world stands still" (p 12). Citing early motion picture technology, Uexküll concludes that the human moment lasts for 1/18th of a second, as this is the point at which individual cells of a projected strip of film are indistinguishable and flow as a moving picture - anything longer than 1/18th of a second can be perceived as distinct flickering images by human optics. In some respects there may be cause to question the exactness of this distinguished length of time (as we will investigate further below), however, it is enough to note that the intent of this distinction is to illustrate that different animals experience the length of a moment quite uniquely. Our tick can potentially wait for up to eighteen years before her final meal of mammalian blood, maintaining the sperm cells inside her separately from her ovum until that blood reaches her stomach. Uexküll proposes the tick exists for this time in a "sleeplike state," in which time stands still for her with no perceptible change in the world for not mere fractions of a second, or even hours, but for years at a time, until she is roused to action by the stimulus of the odour of butyric acid. While this characterisation of moments as species- or organism-specific serves to justify Uexküll's arguments that time itself is relative to, and to a degree reliant upon the living subject, there are also some problematic relations surrounding the framing of this perceptual time, mostly suggesting that this subjective relativity goes further than in his proposed analysis, with the subject actively engaged in the perceptual act of being *in* time on not one, but multiple levels.

Husserl's phenomenology, which holds that the very nature of the activity of consciousness itself is fundamentally intentional, and that this intentionality is co-relational with the world the subject finds her or himself within, emphasises the temporal aspect of all experience - that is, that the intentionality of consciousness is inherently indicative of a consciousness of internal time (1991), a consciousness of a *now* which is both unity and succession. Newtonian time, by contrast, describes individual *nows* as discrete units, separable from one another, while Kant's transcendental time depicts the conscious experience of a temporal object as being dependent on mind itself, whereas the perceptual act of being *in* time, as characterised by Husserlian phenomenology - as well as Uexküll's *Umwelt* - seeks to explain how the continuity of a succession of moments presents itself to consciousness as such a unity and continuity. Husserl's phenomenological time-consciousness does not counter Newtonian conceptions of time, where each *now* is distinct from those around it, but instead builds upon this in his characterization of the temporal, with three separate levels of time (objective time, subjective time, and internal time) which make possible any knowledge of time as a unity. Our consciousness of internal time as a succession makes possible our awareness of subjective time, which in turn makes possible the apprehension of (Newtonian) objective time as a measurable quantity. For Husserl, *now* functions as a point of temporal indexation for objects and events in time, which for him is both fixed and flows (1991: 31), and one never experiences *now* in isolation from what precedes and follows, but as a relation between them, an interplay between past and future: the perceptual act of being *in* time.

Complications of Moment

Firstly, we must allow Uexküll some latitude with his conclusion of the length of a human moment being 1/18th of a second on the grounds of the visual projection technologies available when he was coming to that conclusion. Present-day video frame rates and screen refresh rates are considerably greater than his proposed 1/18th of a second, and the human eye can certainly detect a difference between, for example, a monitor or television reconstructing images every 1/60th of a second and one doing so 120 times every second. Frame rate (which is what he was basing his analysis on) is not quite so rapid, with television screens displaying either 30 frames per second (NTSC), 25 frames per second (PAL), or 24 frames per second (film), with the higher refresh rates meaning that each frame is rendered and reconstructed multiple times to coincide with the refresh rate of the screen itself. In the case of a 120Hz refresh rate monitor or television displaying 24 frame per second film, each frame is displayed five times within each 1/24th of a second. This discrepancy is accentuated further in the case of images rendered by discrete graphical processing units, such as those designed for computer gaming, which can produce much greater frame per second rates depending on the rendering task itself, and it is not uncommon for gamers to experience greater than 120 frames per second on 120Hz monitors, effectively rendering and refreshing in synch 120 times every second, producing an immersive gaming experience quite unlike one on a lower rendering and/or refresh rate. Canadian studies on the modulation of fluorescent lighting (1995)[5] suggest that while the "flicker" of a 60Hz refresh rate cannot be detected consciously by subjects, it does have effects upon the visual cortex nonetheless, particularly after long periods of time, and that electroretinography can elicit rhythmic potentials within the visual cortex at as high as 147Hz - suggesting, in effect, that a human moment (within the nested level of the visual cortex) may potentially be as short as 1/147th of a second, if we are to use Uexküll's definition of a moment as "the briefest time units, within which the world shows no change."

There is a further complication caused in the process of saccadic masking - or visual saccadic suppression - in which the brain discriminately blocks visual cortex processing during fast motion eye movement in such a way that neither the gap in visual processing nor the blurring of the image being processed from the motion of the eye itself is perceptible to the viewer, creating a moment itself in which the world can show no change for the individual. Only one very small part of the human retina, called the

[5] http://web.mit.edu/parmstr/Public/NRCan/nrcc38944.pdf

fovea, furnishes extremely high resolution images, and this plays a pivotal role in resolving objects in the visual surrounding. As a result, when visually scanning, the eyes move in quick, sporadic movements, both eyes simultaneously in the same direction, called saccades, focussing in turn on points of interest in view, building a three-dimensional picture of the larger scene, each saccade moving as fast as the eyes are capable of moving, the fastest movements produced within the human body (Fischer, Ramsperger, 1984). This movement causes an inescapable blurring of the image as processed by the retina while it sweeps the visual field. This movement and blurring of images creates a visual error which is of no use in creating a visual image of the world, and humans are in effect blind for the duration - the world showing no change for the individual. This phenomenon can be experienced by anyone looking into their own eyes in a mirror, looking from one eye to another - while an external observer will see the motion of the eyes, the individual will only ever see their eyes in the fixed state (Rommelse, 2008: 391-414). These "moments" of saccadic masking occur relatively constantly in human vision, and can last up to 1/20th of a second, close enough to Uexküll's proposal of 1/18th of a second for the purpose of theoretical analysis. During these moments of saccadic masking, information is still being transmitted to the brain from the optic nerve, with perceptual memory responsible for synthesising the information gathered (trans-saccadic integration), which can in turn create an illusion of perception known as chronostasis, in which temporal duration can be perceptually extended giving a false perception of time (where time effectively "stands still" for the perceiver for a brief "moment").

This analysis is further complicated by the fact that the division between the perceptual processes of the sensory apparatus and the processing functions of mind is as vague for us today as it was for Kant, and just as problematic. Uexküll references experiments conducted by Johannes Müller, which demonstrate that the optic nerves register every type of sensation upon them as sensations of light, including waves, physical pressures, and electric currents, "our visual sensory cells produce the same perception whatever the source of stimulation"(1934: 9). Further, as Kitcher writes, "visual images do not emerge simply from retinal data, but require a great deal of processing" (1996: xxxiv), leading to ambiguity as to whether that processing occurs in the sensory construction of the visual system itself, or whether it is a process of cognitive faculties. If this visual system on which Uexküll bases his length of a moment is in equal parts a construction of the visual system (and its process of perceiving all forms of stimulation as sensations of light) and the cognitive faculties responsible for synthesising those images brought to it through the optic nerve, then the quantisation of the duration of a human moment must necessarily be even more subjectively relative than can be deduced through analysis of mere physiological construction.

There is a curious complication in Uexküll's own treatment of the tick's moment (and consequently the human moment), where he describes the tick as waiting "in a sleeplike state, of the sort that interrupts time for hours in our [human] case" (1934: 13). In one respect, a "sleeplike state" is certainly a duration of time in which the world for us "shows no change," and one could add a number of other physiological states and conditions in which this can be found to be the case, such as being under the effects of sedation, or being rendered unconscious. In these states, the cognitive faculties can still be operative, creating sensations of visual stimulation (as occurs when dreaming), noetic content (mental phenomena) of the sort Husserl believed to be legitimate objects of study and phenomenological philosophical enquiry - in which, for consciousness, the world does show change. It must also be noted that during the sleep state of dreaming in humans the eyes undergo periods of saccade in rapid eye movements, a curious concurrence considering that the optic nerves interpret every sensation as a sensation of light. Further implications which may be drawn from these points will be examined further in this chapter in the section "*And it goes deeper...*".

That a dedicated sensory apparatus such as the optic nerve deciphers various stimulation according to its purpose is not curious in itself - light upon the skin is perceived in tactile and incalescent terms, in accordance with the afferent sensory capacities of our largest organ, the skin - but instead that the purely cognitive processing act which occurs in the dream state in turn creates phenomena within the image-forming and perceiving visual systems, suggesting an intimate psychophysiological articulation between the sensory and cognitive processing faculties themselves, neither capable of functioning purely independently. Further, as regarding "moments," the perceptual experience of time can function very differently for conscious experience in accordance with differing states of consciousness, though I believe Uexküll's response to such concerns would be to suggest, as he has elsewhere, that such arguments are for the psychoanalyst and psychologist rather than the theoretical biologist, for whom psychology is to be treated according to physiological principles (1926 : xiii, 42-3, 85, 131, 133, 135, 146, etc.). Although frequently in his theorizing Uexküll urges us to consider the physiological as distinct from the psychological, his own conclusions regarding the cognisance of animals not as "mere machines, but as subjects whose essential activity consists of perceiving and acting" (1934: 6), urging us to see "not only the mechanical structure, but also the operator" would suggest that this link between the two is inseparable, and must be acknowledged in the consideration of the *Umwelt*.

Mind, the "man" behind the curtain

Uexküll employs a remarkable poetic analogy for how every animal experiences and interacts with its own world;

> Figuratively speaking, every animal grasps its object with two arms of a forceps, receptor and effector. With the one it invests the object with a receptor cue or perceptual meaning, with the other, an effector cue or operational meaning. But since all of the traits of an object are structurally interconnected, the traits given operational meaning must affect those bearing perceptual meaning through the object, and so change the object itself. This is best expressed briefly as: *The effector cue or meaning extinguishes the receptor cue or meaning*. (1934: 10)

Conceived in human terms, we have a vast array of devices and tools with which to effect change and interact with our world, though broadly speaking, all of these tools can fall into one of two categories; perceptual tools and effector tools. Perceptual tools include all of those mechanisms which serve to heighten our own biological sense capacities - lenses which allow us to observe very small or very distant things; bells, cones, and diaphragms to amplify acoustic signals - and in addition to those mechanisms which enhance our sensory capabilities beyond normal range are those technologies which serve to augment impaired senses to normal human levels, such as corrective lenses and hearing aids. Effector tools include all those vast and wondrous mechanisms we have developed to "effect our purposes," mechanical augmentations of every sort commonly considered a tool - levers, pulleys, wheels - from simple machines to complex compound devices such as engines, all of which provide some sort of mechanical advantage over our physical world beyond our native physical capacities.

In Uexküll's analysis, these categories of perceptual tools and effector tools correspond to perceptual cues and effector cues which present and represent the world to the subject; the "world-as-sensed" to the "world of action" (1926: 80-81), which together form the subject-world for every organism, "perceptual and effector worlds together form a closed unit, the *Umwelt*" (1934: 6). He describes this relationship as a "functional cycle" or "reflex arc" whereby a perceptual receptor admits only certain stimuli as influence, which when presented with the corresponding stimulus is replaced by a muscle movement or physical response (effector cue), simultaneously extinguishing the responsible perceptual cue and replacing it with its associated effector cue. While he does employ the relational terminology of a physiological reflex arc, and its associations with mechanistic response, Uexküll is also at great pains to counter this with a biologist's response that nowhere is any of this functional cycle merely the transfer of motion, as is the case with mechanism - but instead the transfer of stimulus - stimulus that does not occur in the objects presenting them, but in the subject itself perceiving the stimulus (1934: 8). It is in the room made by this important distinction that we find not the mechanism, but the *operator* within every distinct functional cycle, the subject and object "dovetailed into one another, to constitute a systematic whole" (1934: 10).

It is worth noting here how Uexküll's "functional cycle" or "reflex arc" also follows Merleau-Ponty's efforts to overcome the tradition going back to Locke which views perception as a causal product of sensation, particularly the "intentional arc" which he proposed to underpin conscious perceptual life, "which projects round about us our past, our future, our human setting, our physical, ideological and moral situation" (Merleau-Ponty, 1962: 136). While Husserl's phenomenology proposed that "all consciousness is consciousness of something," Merleau-Ponty's phenomenology takes into account phenomena which are incommensurable to any distinction between noesis and noema, such as consciousness of time (which is neither an act of thought nor an intentional object of thought, but more appropriately - in Kantian terms - a condition of thought), and instead proposes that all consciousness is perceptual consciousness. For Merleau-Ponty, we are embodied subjects (for whom the body is at once both subject and object - noetic and noemic) involved in the processes of existing, and perceive all perception of the world through our bodies, and it is through that embodiment that we try to get a grip on the world through our perception and manipulation of it (1962: 235). In this, he sees the underlying motivation behind all action not in the Heideggerian postulation of identity formation through action, but in moving to attain equilibrium with one's situation in the world, to achieve gestalts, with perception experienced as ability or constraints on ability. Thus, what is perceived is not phenomena as displayed to an embodied observer, but the external world is presented as a series of possibilities - not as *I think*, but as *I can* (p 206), with the embodied observer becoming instead an agent actively engaged in the process of being;

> In so far as my body is, not a collection of adjacent organs, but a synergetic system, all the functions of which are exercised and linked together in the general action of being in the world... the congealed face of existence (p 272).

Returning to Uexküll, this correspondence between organism and environment also leads to a further Gordian knot, in that it may be suggested from this that the organism is "merely an imprint of its surrounding world... which adjusts itself more or less exactly to external influences" (Uexküll, 1926: 81). What this position fails to take account of is that this unity is contingent upon the organism itself - it is not a property of the world itself, but only forms its unity in concert with the organism - "the properties of the surrounding-world become linked up into a unity only when they are in agreement with the properties of the animal". This knot can be somewhat unravelled, as Uexküll seeks to, by comparing the anatomical assembly and distribution of sensory organs between various animals.

In human beings, our sensory capacities are handled by discrete anatomical systems corresponding to the method of transmission of the sensory data they are responsible for - the eyes are responsible for interpreting colour and light, and deciphering that informational stimulus, and are capable of doing so by means of their construction, and as we have already examined, are incapable of registering any other various forms of non-visual stimulation as anything other than light. Distinct from this, auditory perception is the responsibility of the ear, in the mouth lie receptors for taste, the nose for perception of smell, and the skin for accession of tactile stimuli. In this distinct sensory array can be found a correspondence between the specific receptor systems and the method of transmission of the corresponding stimuli - light, as both wave and particle is transmitted spatially, sound is transmitted as wave forms within the medium of air, taste is a product of soluble substances, aroma conveyed also within the medium of air, and tactility through pressure, movement, and heat - ultimately all forms of the same mechanical energy. In this we discover a uniformity between the method of transmission of properties and the adequate stimuli receptors responsible for them. The same correspondence cannot be attributed to aquatic anatomy however. In water, the transmission of properties for both smell and taste are resultant of substances dissolved in water - however, the smell and taste organs of fish are as distinct from one another as in all other vertebrates (1926: 82). If the anatomical construction of an organism was simply a reflection of its surrounding world, an imprint of environment, the olfactory and gustatory sensory systems of aquatic animals would be a single organ of perception with no distinction made between taste and smell due to the properties and character of their method of transmission and convection in the surrounding environment.

Uexküll sees this correspondence as "Nature herself at work" (1926: 82), with life itself, and its outworking through multifarious organisms "merely variations on a set theme, and a limit can be set to the possibilities they present" (p 84). Expanding from the Darwinian concept of ecological niches being filled by populations of organisms differently in differing biogeographical ecologies, Uexküll's assessment offers an insight whereby we may come to appreciate how this ecological niche may be more accurately considered to be forged dialogically between the subject and object. The term niche comes to us from the French *nicher*, meaning *to nest*, and a nest is a perfect analogy for the larger processual dialogue which defines Nature, *Umwelt*, and habitus. The nest is in turn the co-creation of the nesting organism and its larger environment, and relies equally on both for its existence. The nest is at once habitat- and behaviour-dependent, and speaks to both the world-as-sensed and the world-of-action of any given nesting creature. Its composition is constructed from the surrounding environment, and its construction dovetails with it - it is not merely a reflection or imprint of the surrounding world, but a dialogical resultant with it. In this we can find that all descriptions of qualities of nature and ecology must simultaneously be couched in *subjective* and *objective* terms, as they always refer to a subject-object relationship of co-creation, or dialogue.

And it goes deeper...

This structural interconnection where meaning is forged through a process of a functional cycle between subject and object manifests not only at the level of organism and its environment, but also at every (nested, compositional) level within the construction and biology of each organism. As Uexküll puts it so eloquently, "The manifold perceiving and acting of the whole animal may thus be reduced to the cooperation of all the tiny cells, each of which commands only one receptor sign and one effector sign" (1934: 9). As the eye is responsible for seeing, and the ear for hearing, every cell which forms the composition of these senses operates with its own receptor-effector functional cycle, constituting their own systematic wholes, relating to other cells (as subject to object) through several functional cycles. There is no single world, but untold myriads of spatial and temporal planes within every individual living organism, and in which the organism exists, "which interpenetrate and complement, but in part also contradict one another" (1934: 14).

This implicitly developmental hierarchy is examined in depth by Salthe in many books and papers on biological complexity. By Salthe's assessment, hierarchies emerge in two distinct yet interwoven forms; scalar hierarchy, which seeks to account for how the world has developed its stability, and specification hierarchy, which models how change is possible within such stable systems (Salthe, 2001). Scalar hierarchy may be thought of as similar to Matryoshka dolls - Russian wooden dolls in which figures are nested inside one another following after a theme - such that parts can be found nested within wholes, in which any particular level of complexity is only fully comprehensible as it relates to the levels above and below it, forming a stable system of overlapping hierarchical triads. Specification hierarchy, by contrast, focuses on the possibility of emergence created from current highest levels of complexity, where the development of new complex forms (relations) is made possible "by the accumulation of informational constraints, modelled as a process of refinement by way of adding subclasses" (2001: 2).

Within this hierarchical nesting of wholes which in turn are parts within wholes, temporal quantisation of moments differs with respect to each perceptual modality of a given level of complexity, with any form of perceptual change being more rapidly achieved at lower levels of complexity within biosemiotic systems than in those higher levels of complexity within which they are functionally imbedded. And as Salthe points out, "metabolic rates and development are much faster in smaller dissipative structures (including organisms), and their natural life spans shorter" (2001: 3). While an organism can be conceived on its own as a biosemiotic system with its own particular *Umwelt*, it is also composed of hierarchically nested biosemiotic systems functionally embedded within it (down beyond the cellular level, to the levels of organelles and the levels of DNA and RNA), where each biosemiotic system necessarily has its own *Umwelt*, each functioning according to its own hierarchically organised perceptual modalities, its own receptor-effector functional cycles.

For example, the conscious *Umwelt* of the human self (the moment characterised by Uexküll's 1/18th of a second) functions at a slower rate than the *Umwelten* of the nested biosemiotic systems which subserve that human consciousness, and those at slower rates than the *Umwelten* of the nested biosemiotic systems which serve and compose them, and so forth. As noted earlier, the saccades of the human eye are the fastest motions the body is capable of, and function at a much more rapid sampling rate than the visual cortex, which in turn operates at a much greater sampling rate than the consciousness which interprets the visual information presented to it, as the brain must stitch together multiple inputs into coherent visual information, with conscious visual perception emerging edited and more slowly changing than for the levels on which it depends for that informational stimulus. In this, the cumulative information brought to the higher levels of complex biosemiotic systems from the lower levels which they depend on and from which they form wholes, takes a very long time in lower scale of complexity moments, by orders of magnitude, and because of this, "informational exchanges between levels are intransitive, requiring interpretation at the boundaries between levels" (Salthe 2001: 2). It is specifically these boundaries between levels that deliver stability within complex, functionally embedded biosemiotic systems, and on which that stability depends.

Undivided lines dividing: crossing boundaries of complexity

There are circumstances, however, in which these boundaries between levels are bypassed, and informational signals are transferred from much higher levels of complexity to much lower levels, or vice versa, and these circumstances typically involve damage to all of the levels involved whose boundaries are bypassed. Such a signal transmitted directly from higher level to much lower level can occur through physiological damage such as caused by misadventure, such as losing an eye in a physical accident; such an event at the level of the conscious organism ignores these boundaries between levels and the interpretation they provide, with all of the subvenient nested levels damaged accordingly. In the other direction, a particular cell may affect the whole organism, such as through unregulated cell growth (cancer), whereby the continued unregulated growth can cause localised and/or systemic symptoms, such as blindness, of the entire organism. In this, the stability developed through the scalar hierarchies is eroded as the boundaries between levels are bypassed.

> Because of the order of magnitude differences between levels in the scale hierarchy, dynamics at different levels do not directly interact or exchange energy, but transact by way of mutual constraint (i.e., via informational connections). The levels are screened off from each other dynamically and (more or less) adiabatically. Because of this, informational exchanges between levels are intransitive, requiring interpretation at the boundaries between levels. (Salthe 2001: 2)

It is, however, important to consider that in any open-ended process, potentials may emerge which extend beyond categories, and any hierarchical structure is always susceptible to change. Potentials for change may lead to evolutions (unpredictable change) which may in fact prove benign or even fortuitous to the organism, and may even be selected as advantageous traits for future generations through epigenetic processes. For Salthe, this hierarchical conception must be understood as a conceptual tool of analysis, and one must not naively prioritise it above all other conceptual tools or explanations or assume that hierarchical relations are the sole principle governing the world and processes of emergence. To make this point, he uses the example of the tides on earth being influenced by the gravitation of the moon, insisting that within a hierarchical conception the oceans and tides must be considered as nested within the earth itself, which is in turn nested within a complex solar system, and that the effects of the tides are resultant of the complexity of the entire solar system, not just the moon, which we often speak of as the cause of the tides.

The rate of the differing perceptual modalities between nested biosemiotic systems and levels of complexity can be seen in the above examples also. In the case of a cancerous growth at a cellular level, initially no symptoms (effects) will be felt by the organism as a whole, until the mass grows and ulcerates through malignant progression to the extent that localised symptoms present or metastasis spreads the growth to other locations in the body. At the level of the organism as a whole, the rate at which change can be observed is subject to the temporal perceptual modality of the whole (the highest level of complexity within the nested hierarchy), whereas, conversely, damage caused at the level of the organism, such as any misadventure which would result in the loss of an eye, occurs across every nested biosemiotic system level at the sampling rate associated with the lowest level of nested system affected.

In these examples, we have two different ways in which the boundaries between levels of biosemiotic system stability may be circumvented through transmission of signals; from higher level to much lower level (top-down), and from much lower level to higher level (bottom-up), and while either event will typically cause damage to all of the levels in between, there is a very great difference between the two regarding any resultant effects on the organism as a whole. Localised top-down events, such as the loss of an eye through misadventure, result in localised effects within the unity of the associated sense-schema; that is, the loss of an eye will not directly result in the loss of hearing or any other sense-schema unity, nor in the loss of cognition. In the example of a cancerous cellular growth metastasising, however, bottom-up events can potentially (and directly) result in effects on the organism as a whole which extend beyond the unity of associated sense-schema. Further, events and dynamics at the whole-organism level can produce cascading effects which go both ways in turn, such as in an individual suffering exposure to carcinogenic pollutants, resulting in damage at a cellular level, causing cells to mutate and divide and grow unregulated, metastasising and causing neurological symptoms.

Considered in this way, just as sensory schema are discrete compact unities, discrete internal organs are also expressions of specific functions serving the whole of the organism, and Uexküll considers the physiological composition of every living organism as equally perfect, and the *Umwelt* of every particular aspect of that composition (organ, protoplasmic cell) equally perfect to it, and that this perfection is ubiquitous throughout all of living Nature; "the lowest, just like the highest living creatures, are, as regards their micromechanics and microchemistry, equally perfect" (1926: 114). Every aspect of function within a biological system, from human cognition to the discrete function of a particular internal organ, to the protoplasm of a single cell, forms a discrete unity, or consists of an independent sequence of impulses (its subject-object orientation to its *Umwelt*) in a way that dovetails with the larger biosemiotic systems in which they are but parts of a whole. In this, it becomes impossible to fully separate any aspect of life mechanistically such that "we can never make certain just where the one begins and the other ends" (p 113).

All the king's horses...

The mechanistic view of Nature is more than analogical, and is expressed through the attempts of mechanistic science to reductively explain everything biological in terms of discrete functions;

> For what is the heart, but a spring; and the nerves, but so many strings; and the joints, but so many wheels, giving motion to the whole body, such as was intended by the artificer? (Hobbes 1652: 1.1)

But the organism is not mechanism, and attempts to treat it as such (medically, pathologically) by identifying independent functions of the component parts of an organism fail to account for the complex interdependent unity of being itself. Just as the personal world of the subject-organism is one entirely composed of relations of carriers of significance (biosemiosis) unique to it - its *Umwelt* - which is but a section carved out of the larger semiosphere, so too is the "personal world" of each nested biosemiotic system which composes it, and at every nested level of complexity, and the same comprehensiveness can be found in the number and manner of subject-object relations to the complexity of the biosemiotic system in question, every biosemiotic *Umwelt* is uniquely suited to its own relationally dependent level of complexity.

A biologically mechanistic response to this position might be found in comparing such complex nesting of biosemiotic systems with the complexity of the system of gears found in finely crafted timepieces. In a finely crafted watch, differing sizes of gears are integrated with one another in such a manner as they keep account of the different quantities which we use to measure the passage of time, with larger gears to mark the hours than those for minutes, than those for seconds, and so on. This analogy holds insofar as the system of gears involved relies consecutively on the smaller gears preceding it, at varying levels of scale (though not complexity). The complexity of the entire timepiece must really be taken as a unity, as a complex compound machine: the rate of change of the minute hand and associated gears relies for its accuracy on the precision of the mechanism governing the second hand, and so on. The minute hand in turn determines the certainty of the marking of the length of the hour, and so on. Mechanistically, each component *only* forms a unity in conjunction with the whole, which can entirely be reduced to the sum of its parts. It is only ever the transfer of motion or mechanical energy which occurs, whereas the defining feature of nested biosemiotic systems is not the transfer of motion or energy, but the transfer of information which alters or informs states which nested systems can exist between. A gear is either moving or not moving - as determined by the gears with which it interacts. Biosemiotic systems, however, engage both actively and passively with their *Umwelten* in response to and accordance with the carriers of significance of its own subject-object relations, and those carriers of significance are determined by the very nesting of the biosemiotic systems themselves - the levels above and below them, which they compose and from which they form wholes.

Returning to the function and composition of the human visual system, we found two distinct lengths of time (moments) which reflect passive and active states of the nested biosemiotic systems involved; a moment of roughly 1/20th of a second when the individual is actively engaged in sensing its world, and the moment of 1/147th of a second of the rhythmic potential perceived (noticed) by the visual cortex when passively engaged with the world of sensory experience. This sevenfold difference exhibits the nested nature of the compositional subject-object relation to the levels of complexity above and below it, which it serves, and which in turn serve it. At the level of subject-organism, the level of complexity above the visual cortex, which the visual cortex serves, the length of a moment is brought into line with the boundary level which allows for interpretation by the higher level of complexity resulting in vision. At the boundary below the visual cortex, the moment is less than 1/7th as long, and this moment can only be discovered through electroretinography which bypasses the active engagement of sight at the subject-organism level. This temporal discrepancy reflects the perceptual modality of the differing levels of complexity (nested biosemiotic systems) involved, and how time is experienced differently at the different levels - informational constraints which are specific to the nested *Umwelten* - with perceptual change occurring more rapidly at lower levels of complexity within biosemiotic systems than in those of higher levels of complexity within which the lower levels are functionally imbedded.

But human beings, as we contend against Hume, are far more than the aggregate of what the senses bring before the understanding: as such minded beings our understanding has an enormous role in creating the world for us, and that is an inherently embodied understanding. In the next chapter we will continue with our examination of the human *Umwelt* by examining the role metaphor plays in our interpretation of reality and attribution of meaning.

CHAPTER 6

The potency of metaphor

The metaphor is probably the most fertile power possessed by man.

- Jose Ortega y Gasset

The aim of the previous chapter was to establish our investigation into the human *Umwelt*, beginning with Uexküll from the perspective of theoretical biology. Here we found a nested developmental hierarchy in which every nested level operates with its own receptor-effector functional cycle through which it perceives and defines its own personal world of subject-object orientation – the human *Umwelt* no single world, but untold myriads of spatial and temporal planes, processes of signification and interpretation – levels of biosemiosis – "which interpenetrate and complement, but in part also contradict one another" (Kull 2010: 87). But there is undeniably also the *I* in which these *Umwelten* form a whole, more properly considered as the human *Umwelt*. As self aware, self-reflexive intelligences and makers and interpreters of meaning, the human *Umwelt* must be understood as particularly embodied and rich beyond measure. This chapter on metaphor should be considered an extension on the previous chapter, extending the analysis from the biological to the contributions of mind and the role that metaphor plays in our interpretation of reality and attribution of meaning.

Musical metaphors

In his investigation of *Umwelten*, Uexküll employs a number of terms we would be better served to omit in order to avoid confusion, however, there is one term he employs that we would be doing an injustice not to borrow in effort to understand this stated relation to time and temporality, and that is "melody." Melody refers to a "succession of sounds," and through melody we can understand "the arrangement in time of different factors" (1926: 13). A melody can be played across differing time signatures musically, and can be altered in tempo (speed) without changing in composition. In using the term, Uexküll is at great pains to distinguish melody from symphony - melody refers to sounds following on from one another, whereas symphony refers to sounds occurring together - though it is only through the combination of melody and symphony that we create *harmony* (1926: 29). This analogy to music can hold well for us, and is more appropriate to the topic of discussion than any mechanistic metaphor.

Compositional music[6] is arranged and broken down into "cells," with a melody being a rhythmic group of notes or cells which move forward toward a resolution. Harmonic melody is the support for the main melody within a composition, composed of chords and notes vertically placed above the melody, which itself is more linear. The harmonic melody reflects a relationship with, and an attempt to resolve the melody. Beethoven's 5th Symphony, for example, is built upon a cell of only four notes played twice, "short-short-short-long," which then proceeds with variations on the same theme in sonata form, developing through many different keys and returning to the original melody. In

[6] I would like to thank Jason Chalmers from the Victorian College of the Arts for his extended discussions on the topic of musical composition and theory, without whom this section would not have been possible.

this, the cell or melody can be seen as the theme on which the sonata form expands and develops, always returning to the place of origin, resolving the piece of music as such. Just as every aspect of function within a biological system - from human cognition, to the discrete function of a particular internal organ, to the protoplasm of a single cell - forms a discrete unity, or consists of an independent sequence of impulses (as its subject-object orientation to its *Umwelt*) in a way that dovetails with the larger biosemiotic systems in which they are but parts of a whole, so too does every "cell" of a musical composition dovetail into the larger progression of that piece of music in such a way as to seek its resolution, and is a variation upon a single theme with the intention of resolving that melody. The Husserlian conception of being in time, where one never experiences *now* in isolation from what precedes and follows, might best be understood not through Uexküll's visually quantised moments, but through the framework of musical moments, temporally dependent on context. Music is inaccessible to conscious experience in Newtonian time, where individual *nows* are separate discrete units, whereas the relation between moments - the interplay between past and future - the perceptual act of being in time, are what make music possible for us. And just as our consciousness of internal time as a succession makes possible our awareness of subjective time, which in turn makes possible the apprehension of (Newtonian) objective time as a measurable quantity, so too does our conscious experience of music temporally make possible for us the representation of that auditory being *in* time in the form of musical notation - the Newtonian form of music, outside of experience.

Complex complications

To properly define the human *Umwelt* in the same manner that Uexküll has done for the tick would be all but impossible for this limited discussion. As mentioned, every biosemiotic *Umwelt* is uniquely suited to its own relative level of complexity, and on such a scale human consciousness must be considered at the other end of the spectrum of complexity from the tick herself. The human *Umwelt* is not even one, but a myriad of nested *Umwelten*, and at the level of complexity of the human being as organism is such a rich complexity of *Umwelten* that it feeds back upon itself, with human created meanings potentially (and often) becoming prioritised above all other carriers of significance.

Even in strictly biological terms, we are unable to fully explain how the human being relates to and senses the world, as our senses extend far beyond the commonly accepted five senses into many other areas which we have touched on throughout this discussion, such as proprioception, senses of time and space, orientation, oscillation, pressure, temperature, pain, hunger, thirst, anxiety, bodily sensations, balance, kinaesthesia, even a sense of our own awareness. The information brought to us by our senses all relies in some way on mechanical processes (the lenses of the eye, the drum of the ear), but at every stage requires not merely mechanism but also an operator, with the mechanical being translated from energy into information (chemical and electrical signals) as/before they are sent to the brain (for those indeed that are) at the boundaries between the nested levels of biosemiotic complexity. We observe at each nested level, whether we focus on the organs of sense which serve our perceptions or the motor organs which implement our actions, the same structural interconnection of perceptual or receptor signs and impulses or effector signs; "subjects whose essential activity consists of perceiving and acting" (Uexküll 1934: 6), the *Umwelten* of those subjects, those operators.

Although we may be unable to define the minutiae of the human *Umwelt*, there is still much we can say regarding how we might best go about considering it, primarily through investigation of the function of metaphor. The metaphors we employ in describing something serve to determine how we think about that thing. Language is important to culture because of just how all language is embedded within and permeated by meaning - language *is* (our, human) meaning, as it is our attempt to represent not just the world we find ourselves in, but our entire human history within that world. Our language locates and positions us (bodily) within our human history and culture and is constituted through constellations of metaphor which simultaneously reflect our peculiar embodiment, as well as shape how we interpret reality.

Metaphorically speaking...

In *Metaphors We Live By*, Lakoff and Johnson (1980) explore in great detail the complex role metaphor plays in human cognition, meaning-making and self-understanding, and the systematic rationale (embodied and relational) which provide the coherence of metaphor via the domain of human experience. Metaphors, while linguistic in qualia, derive their systematic rationale not through language itself (through the literal definitions of the terms employed by the metaphors used), but through embodied experience and the cognition of that embodied experience, with almost all language we employ accoutred by metaphors of human embodiment and activity. Lakoff and Johnson argue that metaphor is not a matter of words, but of concepts directly drawn from lived experience. They argue that it is a commonly held misconception in Western thought, going back to Ancient Greece, that metaphors are linguistic expressions - that metaphor is about the way we talk - arguing instead that metaphor is about how we reason and conceptualise the world through conceptual comparison with our lived embodied experience, and that metaphorical conception is essential to abstract human thought.

Metaphors are ways of partially structuring one experience in terms of another, often in effort to structure abstract experiences in terms of more concrete ones, and are pervasive throughout not only human language, but the human conceptual system; constituting our worldviews, resonating both our perspectival subjectivity and our shared conceptions of human experience as humans. In this, metaphors are entirely conceptual, and conceptually inferential. Conceptual metaphors allow us to use what we know about our experience with the world subjectively as a (metaphoric) tool for drawing inferences in other domains that are less concrete and not grounded in direct experience (love, justice, life, etc.).

> A great deal of everyday, conventional language is metaphorical, and the metaphorical meanings are given by conceptual metaphorical mappings that ultimately arise from correlations in our embodied experience. (1980: 173)

A great example of experience from a concrete domain being correlated with systematically derived meaning within an abstract domain can be found in the metaphor of life being a journey. The *life is a journey* metaphor speaks to us as embodied modern mammals, and also to our technological capacities. When we are born, we are at first incapable of autonomous travel or locomotion, dependent upon our parents or carers as we first learn to crawl and eventually walk. It is no great surprise that the *life is a journey* metaphor is less conceptually correlative to infantile life, as the possibility of conceptual thinking develops after the ability to walk. Further that such a metaphor speaks to our current technological capacities, as we are as yet incapable of teleportation, and if we wish to move from one place to another, we must do so as a journey, a progression. Whether we choose to employ the *life is a journey* metaphor for ourselves or not, the existence of the metaphor itself stimulates new possibilities for conceiving our lives through correlations that can be drawn from our embodied experience of moving through the world. As a means of self-conception, I can be prompted to question myself through such metaphors; if I am progressing on my journey, if I know where I am going, if I have a destination or goal, if I am equipped for such a journey, if I am leading or following (or, indeed, if anyone is on this journey with me, or if I travel alone, and if so, if others have gone before me), if I have "broken down," or have "become lost," or have been "railroaded" in a certain direction, or have "circled back on myself," and have "covered this ground before." If I accept such a metaphor for my own life, I am led, through correlations with my lived experience, to questions regarding my own identity as one who is on a journey - if my journey has a purpose, or if the purpose is the journey itself, and who is it that makes a journey?

Our English term 'journeyman' refers to a person who has completed an apprenticeship in a given craft, but is yet to become a master of the arts of that craft, and comes from the French *journée*, which refers to potential work or travel which is possible within a single day (and the French from Latin roots *diurnum*, meaning simply "day"), with the measure of a day being the time it takes for our sun to journey across the sky and back to where it started, or our planet to journey through a single revolution on its axis, depending on perspective. Such a perspective brings up metaphorical correlations suggesting a cyclical nature to such a journey, and a cyclical nature of life itself through conceptual mapping. This would suggest that even as an explorer on my own journey, I am covering ground which has been covered before me, and that my journey is potentially a cyclical one, if only in the sense that *every* life is the *same journey*, by correlation with the movements of celestial bodies as we observe them. And if it is indeed the same journey, that it must be *the same but different*, as even from a fixed-earth standpoint, the journey of the sun across the sky differs from day to day according to the seasons (or perhaps a *similar* journey at a different time). Further, if I am a *journeyman*, in the definition mentioned above, is the journey complete when I become a master (at the craft of life, perhaps), or am I then compelled to aid another in their journey as a master might teach an apprentice? Should I then refrain from attempting to influence the journey of others until I have finished my journey and become a master myself?

The above metaphorical inferences from the *life is a journey* metaphor are, of course, entirely culturally conditioned and culturally specific. As Lakoff and Johnson note, "the human aspects of reality are most of what matters to us, and these vary from culture to culture, since different cultures have different conceptual systems" (1980: 106). A modification on the *life is a journey* metaphor, *life is a highway*, highlights such cultural and environmental constitution in the legitimacy and function of metaphors we can come up with or choose to employ. *Life is a highway* speaks not only to how influential the automobile has been within our own culture, but also to how the physical spaces of habitation, production and human interaction have developed alongside of industry within our cultural history. Highways connect these spaces together, and always go somewhere. Whether connecting the core to the peripheries of a given city, or connecting different cities together, highways are a type of "path" that has been "cemented," as such providing assurance that it indeed "goes somewhere." In travelling along a highway, one is never "forging a path" or "blazing a trail," but is instead always following a path so worn that it has become ontologically elevated into a highway, has a known destination or parameters, and even a name. The *life is a highway* metaphor also speaks further to our cultural artefacts and rituals, with driving (as opposed to being driven as a passenger) having a great deal of associations with coming-of-age customs within our culture. Adolescence marks the period of transition whereby an individual goes from puberty into adulthood, becoming an autonomous legal entity within our society, with associated responsibilities and privileges, one of which being the acquisition of a license to drive. In the *life is a journey* metaphoric conception, the journey of an individual begins when they can walk autonomously, whereas in the *life is a highway* interpretation, a child may be considered as passengers on their parents' journey until what time as they become the driver. Further is the cultural conditioning which accompanies such a conception as *life is a highway*, such as the legal responsibilities and proscriptions bundled with highway travel; e.g. limits to the speed at which we are allowed to travel, or conventions of road travel such as driving on the left or right, and even the threat of discipline for failing to abide by such proscriptions and responsibilities. We can be "pulled over by the cops" or "waylaid by highwaymen." Also concerning praxis, ability and capability, we can "run out of gas" or break down," we can "miss our turnoff" and without a map or illumination, can be left "driving blind."

Such a metaphor as *life is a highway* only works within our culture and physical environment. As Lakoff and Johnson note, "the conceptual systems of various cultures partly depend on the physical environments they have developed in" (1980: 107), and the metaphor of a highway would be incoherent in many radically different environments in which humans live and human cultures develop. A desert or jungle tribesman might have no correlation in experience for such a thing as a highway, but may still draw conceptual metaphorical inferences from *life is a journey*, likely adapted to the embodied experience of the modes of transport common to such environments. In this environment, life's journey may be seen as the following of a path, or the observance or awareness of features in the environment, a "landmark," or a sign "in the stars." Further, that coming-of-age customs might be marked by "milestones," or even that the spatial orientation of such a journey may be inappropriate within a given culture who instead conceives of the passage of time not in spatial terms, but in seasonal terms not removed from temporality, such as "blossoming into adulthood." "Coming-of-age" is itself a conceptual metaphor both derivative and indicative of our experiential orientation of the temporal and spatial as a correlate, if not a unity. We refer to things both occurring *in* time, as well as *at* certain times, both of which are spatial rather than temporal orientations (1980: 99). Which metaphoric entailments are chosen or achieve prominence are decided culturally, and vary as such from culture to culture, and the cultural understanding of a prototypical member of that culture largely determines the orientation of applicable metaphorical concepts (1980: 97).

The Me-First Orientation

Lakoff and Johnson cite Cooper and Ross (1975) in observing that;

> Our culture's view of what a prototypical member of our culture is like determines an orientation of concepts within our conceptual system. The canonical person forms a conceptual reference point, and an enormous number of concepts in our

> conceptual system are oriented with respect to whether or not they are similar to the properties of the prototypical person. (1980: 97)

While one perspective of this might suggest that there are aspects of metaphorical entailment which transcend culture, as they are derivative of something shared across all human cultures - our peculiar human shape - Lakoff and Johnson argue that it is always through cultural interpretation that such meanings are created and attributed. Following Cooper and Ross, they term this orientation of concepts to the cultural archetypal person the "Me-First Orientation," as it is a model form of the cultural "person" which can be accessed by all members of that culture through their own embodied experience. This orientation of embodiment in turn leads to a cultural conceptual orientation which influences the use of language, transforming the norms of the language itself. As Lakoff and Johnson note, humans within our own culture are typically oriented in an upright position, moving forward, actively do things, and conceive of themselves as basically good, which correlates with the order of words in English which are considered more normal than their inverse; it is more normal to say "up and down" than it is to say "down and up." This is due to what Lakoff and Johnson identify as a general principle of language in which words closest to the orientation of the prototypical person come before those whose orientations contrast with the canonical individual. Thus the linear order of our speech reflects the manner in which our embodied orientation acts upon our conceptual system, illuminating one way in which the correlations between language's meaning and use is not arbitrary, but follow a logic of embodied experience. We can observe the prevalence of this "Me-First Orientation" in further exploration of the *life is a journey* metaphor.

Human physiology is oriented *forward* - our eyes are in the *front* of our heads, our hands oriented to manipulate objects in front of us, our knees bend in such a way as to make running backwards quite difficult, and we are mostly incapable of turning our heads around far enough to see everything behind us as well as we can see what is in front of us. In the metaphoric conception of *life is a journey*, "going backwards" is commensurate with regression; we can "backslide" from previous achievements or realizations, can take "one step forward and two steps back," and "backwards" is synonymous with a reverse in (naturally oriented) order. "Backwards" is contrary, opposite, confused, inverted, chaotic, and simply "back to front." In order to "progress" on life's journey, one must be "moving forward." Our physiology is also oriented toward (another metaphor) upright movement and action. On my life's journey, I can "stumble," be "brought to my knees," can just "lay down and die," or I can "get back up and get on with it." In these examples we can also observe the active orientation; to "lay down and die" (potentially ending my life's journey) is passive, whereas to "get back up and get on with it" I am actively engaging in my life's journey. If I am concerned that my life ('s journey) is "going nowhere" I can "do something about it," I can "fix my problems" and "act on new information." In this we can observe the systematic rationale of embodied experience providing the coherence and structure for metaphoric entailment in self-conception and meaning-making.

The covert power of metaphor

Metaphors influence the creation of our realities, and can therefore serve as guides for action. Lakoff and Johnson use the example of one of their students, who coming from a different culture had developed a novel interpretation of a common metaphorical conception. The metaphorical expression was *the solution to my problems*, which he inferred as a metaphor deriving from the source domain of chemistry, in which "problems" were contained within a vat or beaker, "either dissolved or in the form of precipitates, with catalysts constantly dissolving some problems (for the time being) and precipitating out others" (1980: 105). This, of course, contrasts with the commonly held metaphorical conception of *solution* referring to the solving of a problem as one might solve a puzzle. The contrast between the *chemical* metaphor and the *puzzle* metaphor highlights just how differently metaphorical conceptions and entailments can influence our thinking on a given subject. Within the *puzzle* metaphor, a problem exists to be *solved*, and once a solution is arrived at, the problem no longer exists. Within the *chemical* metaphor, problems compose the *chemical solution*, and are never in fact solved, but catalyse and precipitate to varying degrees, with the recurrence of problems a dynamic certainty rather than a failure to find a final solution, as with a puzzle.

To employ such a *chemical* metaphor with regard to problems creates a different relational entailment to the very idea of problems. Problems, in this conception, comprise the *chemical solution* itself, and are to be expected as naturally occurring, rather than instances of disorder to be rectified, or puzzles to be solved and "shelved" upon "completion." Problems are also to be expected to dynamically return, and temporarily dissolving a problem only to have it precipitate back later in time is not considered a failure (as would be a failure to solve a puzzle), but an accomplishment. This would, in turn, serve as a guide for action;

> Rather than direct your energies toward solving your problems once and for all, you would direct your energies toward finding out what catalysts will dissolve

> your most pressing problems for the longest time without precipitating out worse ones." (*ibid.*)

Problems within the *chemical* metaphor have a different ontological nature than in the *puzzle* metaphor. If we (metaphorically) overlay the *puzzle* metaphor with the *life is a journey* metaphor, problems are things which are encountered on life's journey, and once a solution is found for a particular problem, we can "put it behind us" (Me-First Orientation), and even "look back" upon our past accomplishments of the problems we have faced and solved. Within the *chemical* metaphor, the chemical solution of our problems always exists "with us," referring also to another metaphorical entailment in which instrumentality is synonymous with accompaniment or companionship (1980: 99), it is the solution *of* all of our problems, and it is *our solution*. In the *puzzle* metaphor, if I carry my solutions with me (on my life's journey), it may be in the form of a map, or a rule- or guide-book, or perhaps a book of cheat-codes (to use a gaming metaphor), which I can refer to for guidance as to how to (metaphorically) tackle or solve problems I encounter along my journey, and I can encounter problems for which I have no solution. In the *chemical* metaphor, however, my problems *are* my solution *of* my problems, and they are ever *with* me. In this, it is the problems which are solid objects (which can dissolve into the solution, or precipitate out from it), rather than the solution which is solid, as in *ideas are objects*.

In this, metaphors can influence the creation of our realities, "especially social realities" (1980: 115). As our metaphorical understandings, highlighting and drawing coherent organization from aspects of embodied experience (source domain), influence how we can conceive and interpret other aspects of existence (target domain) through recognised isolated similarities between aspects of the two domains, they can thus provide guidance for future action. Such action will obviously then be guided by the relevant metaphoric entailments, successively reinforcing the coherency of the metaphor in such a manner that our choice in metaphor can become a self fulfilling prophecy (*ibid*.). Metaphor is a natural phenomena (p 173), pervasive throughout both conscious and unconscious mental life (p 171), and highlights the role of the body in shaping the mind (p 170). Further, the power of metaphor is so pervasive and encompassing for our conception that our metaphorical worldviews tend to "organize other metaphors into moral and political conceptual systems" (p 175). It is therefore incredibly important which metaphors we choose to employ (personally, socially and culturally), and what guiding principles we follow in the creation and adoption of those metaphors. This discussion will be working toward identifying these guiding principles throughout the course of the argument, with the ultimate proposal made obvious in the final section of this thesis.

Auditioning metaphors

There is a particular quality of metaphor which transcends space-time and our (Kantian) regulation of experience within or through time. Metaphor has the power to speak to the gaps in our sense perception, and to allow us to observe something from outside of those limited perceptions - to transcend our perceptions and even our own *Umwelten*. As Plato urges us to understand by the *Simile of the Cave*, our sense perception (even scientifically) is often insufficient, and discovery of truth best proceeds by way of metaphor.

There are two primary aspects of this quality of metaphor which deserve consideration. Firstly is within a purely philosophical sense, truth proceeds by way of metaphor. In this regard, employment of metaphor is best considered art, as opposed to science, in that a metaphor is not true or untrue in any classical or positivistic sense, as the rightness or wrongness of any chosen metaphor is an appeal not to positivist logic of literal entailment, but to the sensuality of embodied consciousness, an appeal to feeling which has the potential to ghost past the logical mind to the realm where we can dream impossible things. Secondly is the manner in which science proceeds by way of metaphor, putting forward suitably appropriate explanations for the observed behaviours or results for processes and forces of which we actually have no clear idea how they function (such as electricity, gravity, and time, for example).

Metaphor is a facet of language whereby we talk about one thing by describing something else. Simile is a specific type of metaphor which admits it is making a direct comparison ("this is like that"), and is less useful in both the philosophical and scientific uses than pure metaphor, in that the comparisons which may be drawn open up less possibilities and potentials through such direct comparisons. And if truth proceeds by way of metaphor, metaphor itself proceeds by way of dialogical evolutions in which emergent frameworks are successively more appropriate for explaining things than their predecessors, resulting in more coherent positions from which to understand what is happening and what has come before. This process is one of dialogical evolution, with emergent metaphoric conceptions overcoming some aspect of contradiction or incoherence (or conflict with evidential results in the case of scientific metaphors), while building on previous metaphoric understandings. It is through unveiled inadequacies, incoherencies, and contradictions within prevalent metaphorical conceptions that new metaphors find their legitimacy, with promise of possibilities of conception beyond what may have been restricted by previous metaphorical conceptions. Metaphors are "tried on," or "auditioned" for suitability, and like scientific theory are cast aside if they prove inadequate to their purpose.

Collapsing cards

What we can say about the human *Umwelt*, beyond metaphoric, is that at every nested level of biosemiotic complexity we can observe the shared quality of the divine spark of creativity - Nature's creativity. As Uexküll writes;

> The recognition of this gives us an insight into the remarkable organisation of the subject, which is built up not of parts but of whole subjects... Each living cell of the body remains an independent subject, possessing an autonomous rule of function. Each living cell retains both its vegetative and its animal functions, but these are now devoted to the service of the whole. (1926: 224)

Like the cells which comprise a musical composition, every cell of the organism is dovetailed with and serves the resolution of the whole organism. Music is in no way random; the seven notes in a scale were not invented by anyone, but discovered to be the natural harmonies of vibration which exist, and describe their relations. Further, compositional music is not random, or even created as such, but follows explicit rules governing the interaction and resolution of melody - compositional music is inspired, and is more about discovery than invention. In this way, music can potentially be mistaken for mechanism, as there exist formulae which may be followed which express these natural relationships between tones, formulae which potentially can be employed through equations (and even these formulae are culturally constituted) . Similarly, the complexity of organism can be (and has been) mistaken for mechanism, particularly for how well mechanical metaphors can serve us in describing biological functions ("For what is the heart, but a spring..."). Though while this mechanistic reductionism may serve us partially in describing parts and their functions, it is utterly incapable of expressing the wholes which they form - it is mere Newtonian notes forever quarantined off from the possibility of living expression.

We began this discussion with the proposal that contemporary human ecology is beset by a quandary of semiotic dissonance, whereby we have elevated in priority our own constructed meanings above those of living Nature's own biosemiosis, with the proposal that we must find a method whereby human agency can successfully engage with the living biosemiosphere from which we emerge and on which we depend for our very existence as a species. Through the adoption and employment of a metaphor of music we can see how the mechanistic alternative has failed us as a species – the semiosis produced within the human *Umwelt* has no direct means of interpretation by successively lower levels of complex organization, and the endurance of those levels of complexity is still entirely dependent on the strategies of the levels of complexity above. The mechanical conception is discordant, and is based in a semiotic dissonance.

Through the metaphor of music it can be seen that we must listen and learn the resonances through which living Nature operates, and only through this process can we expect to make our own semiotic dissonance consonant with Nature's patterns. The comforting assurance of the effort being that we are perfectly equipped for doing so – indeed, on many levels. The structural interconnection where meaning is forged through a process of a functional cycle between subject and object manifests not only at the level of organism and its environment, but also at every (nested, compositional) level within the construction and biology of each organism. Within this hierarchical nesting of wholes which in turn are parts within wholes, each biosemiotic system necessarily has its own *Umwelt*, each functioning according to its own hierarchically organised perceptual modalities, its own receptor-effector functional cycles. At the level of humans as minded selves, our embodied understanding plays an enormous role in the construction and interpretation of our realities – to the degree that we are free to elevate our own human level created semiotic systems – and they can become just as *real* to us as anything we might call *Nature*.

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In this and the preceding chapter, we have turned out investigations of what it means to be human through the theoretical scaffolding provided by Uexküll and others of the *Umwelt*. In so doing we have found an untold myriad of complexity, the self a hierarchy of selves within selves, wholes forming wholes, all the way down. All the way up, however, we still find an elusive *I* which exists, and exists in its own incomprehensibly rich *Umwelt*, which we found to be most heavily shaped by metaphor, and found a great importance relating to what metaphors we adopt and what guiding principles we may follow in the creation and adoption of these metaphors we live by. In the next chapter we will be concluding this current section on the investigation into what it means to be human by investigating our most dominant and pervasive metaphor: money.

CHAPTER 7

Homo Economicus

Money, n. A blessing that is of no advantage to us excepting when we part with it.

- Ambrose Bierce 'The Devil's Dictionary'

As mentioned in earlier chapters, it is a primary contention of this thesis that our contemporary semiotic dissonance occurs principally as a result of our prioritisation of our own (human level) created semiotic systems over others, particularly as we have adapted as a species to respond more readily to short-term "fires" than long-term "trends." For example, we have in many ways prioritised the semiosis of our human constructed economy over that of the biosphere itself, and the global responses to issues concerning both highlight this prioritisation. Such is the case to the extent that environmental concerns only receive serious attention to the degree that environmental changes produce economically determinable affects. This is a primary contributing factor in the creation of the semiotic dissonance between our own human created semiosis and the biosemiosis we are emergent from and within and are dependent upon for our own biological survival, as the scalar hierarchy of nested levels of complexity relies entirely on the lower levels of complexity for possibilities of emergence at higher levels though the epigenetic process. However, successively lower levels of complex organization have no direct means of interpreting semiosis developed in the higher levels; simply put, Nature has no access to the dialectic of our economic systems, nor are our economic systems sensitive to the dynamics of Nature.

... And all the King's men

Simplifying the equation, our economic systems signify our social organization, which in turn signifies us as social organisms. Organism in turn signifies and involves biology, which in turn entails chemistry. Within this hierarchical arrangement, as Salthe notes, "only a very narrow set of possibilities could imply organism sociality" (2001: 4). The possible emergence of new systems is greatest within this hierarchical construction at the level of chemistry, and the range of possibilities lessens dramatically at each level above; biology could create far fewer possible emergent systems than chemistry, and sociality far fewer than biology. Our economy, at the top of this particular hierarchical arrangement, is restricted in its possibility for emergence of new forms again far more than at the level of sociality, diminishing the ability to adapt or respond to changes and possibilities resultant from lower levels in the complexity hierarchy. As Salthe puts it:

> Involved here, as in all developments, is the process of senescence, a condition of information overload (recall that information in this hierarchy is transitive across levels), leading to overconnectivity, leading in turn to functional underconnectivity, leading in its turn to inflexibility and habit driven responses (loss of requisite variety), leading ultimately to loss of adaptability (inability to produce interpretants of novel situations)." (Salthe 2001: 4)

Put even more directly, economic responses to ecological concerns are sophistic solutions which in no way account for the complex hierarchical arrangement which makes possible our biological emergence, while placing at risk our continued existence by restricting access to all lower-level emergent processes to interpretation exclusively through the metadialogue of the economy. Nature qua Nature is not directly accessible to interpretation within an economic framework, and is instead only invested with value as interpretable through economic modelling: as resources to be used, creating incoherence between our cultural (economically interpreted) conceptions and natural biosemiotic relationships external (and prior) to those cultural conceptions which make possible not only production, but our very emergence and continuance within the biosphere.

The relationship of effect between coherency and incoherency is vastly different in nature than in human culture. Within human culture, incoherencies catalyse possibilities for development (and from this, continuation) because human culture is never fully formed, and is reliant on adequate perceptions and interpretations. By contrast, Nature encounters incoherencies as stumps in progression, narrowing the set of further possibilities for emergent novelty, as the scalar hierarchy of nested levels of complexity relies entirely on the stability and coherence of lower levels for possibilities of emergence at higher levels. In this, coherence is correlated with stability and integrity, both in the hierarchically arranged nested levels of complexity and in the realm of human culture. This is due to the coherence - not just within a given level of complexity, but its consistency and integrity with levels above and below it - which is a hallmark of functional complex hierarchical systems as we have outlined. Cultural or not, as beings of and within this system of Nature, as "emergent phenomena within nature," (Gare 2001) who we are, our conception of ourselves, does not merely influence our relationship with nature and the external - it *is* our relationship with the external.

Just as the superior economic efficiency of early capitalists eventually exposed the irrationality of moral constraints on economic productivity (Gare 1996), so too, as the globalisation of market forces spreads to all corners, does the very nature of the market supporting them display a core tenet of entrenched irrationality and incoherency in the very nature and function of markets (when instituted against the backdrop of Nature which makes their emergence possible at all). Our economic systems seek limitless growth, something just not possible in a finite world (which may or may not be best conceived as a complex superorganism). Regardless of actual constraints imposed by Nature, time and the seasons (and the dimensions of our planet itself, the capacity of its resources), our economic systems strive for ever increasing returns and exponential growth. It is said that numbers do not lie, but in the case of market speculation within the capitalist paradigm, they also bear no relation to the world of praxis which they claim to model, and economic responses to ecological crises "could never put Nature together again."

Piling it on; self-organized criticality (SOC)

In the preceding chapters we have discussed how the mechanistic metaphor has failed us as a species, and has contributed to the dissonance between human level semiosis and the biosemiosis from which that human level emerges and becomes possible. One of the prominent metaphorical elaborations of this mechanistic metaphor is a characterization of nature as a "blind watchmaker," able to make continuous fine adjustments without the requirement of a pre-given plan or agent – the dynamics of nature wound up and unfolding, including the emergence of mind and humanity (Dawkins 1986, 1976; cf. Paley 1802). Bak (1996), proposes an alternative explanation of "how nature works" in his book of the same title, positing "self-organized criticality" as "nature's way of making enormous transformations over short time scales" (p 61), where "criticality, and therefore complexity, can and will emerge 'for free' without any watchmaker tuning the world" (p 48), going as far as to assert that "self-organized criticality is so far the only known general mechanism to generate complexity" (p2).

Bak proposes the state of self-organized criticality (SOC) as a model for evolutionary biology in which systems can evolve or converge from a non-self-organized state into SOC through internal dynamics responding to changes within the system, where periods of punctuated equilibrium (Eldridge and Gould 1972)(or stasis) are separated by intermittent bursts of activity. Bak contends that "the concept of punctuated equilibrium turns out to be at the heart of the dynamics of complex systems" (p 29), and investigates a number of examples from the natural sciences which display power laws associated with such complex behaviours, using the model of a pile of sand to relate to such examples as earthquakes, biological extinctions, naturally occurring fractal patterns, solar flares, traffic jams, the human brain, and of course, economics. Before settling on the example (and metaphor) of sand piles, Bak began with experiments involving coupled pendulums, in which changes to the state of individual pendulums would eventually build up potentials of energy affecting the movement of other coupled pendulums which would then intermittently result in "avalanches" in which a small change in the state of a single pendulum could result in massive cascading changes throughout the system. Part of Bak's intention is to demonstrate that catastrophic change events (such as the extinction of dinosaurs) do not require catastrophic level events for their impetus (such as a meteor impact in the case of the dinosaurs), but can result from gradual changes in system-internal dynamics, where "large catastrophic events occur as a consequence of the same dynamics that produce small ordinary events" (p 32), and that these dynamic events follow familiar power laws; particularly Zipf's law, Gutenberg-Richter power law, $1/f$ signal (noise), and fractal dynamics.

Zipf's law, or Zipfian distribution, is a mathematical power law of probability distributions which can be found in an enormous range of data sets in the physical and social sciences, from language use to population densities, in which frequencies of action or occurrence are inversely proportional to distributional ranking. At its core, Zipf's law concerns two variables in a given data set; frequency and ranking, in which the frequency of a given rank is roughly twice the frequency of the rank below it, and so on, the graphical logging of which conforms to an inverse linear plot. The same inverse linear plot can also be found in the Gutenberg-Richter power law (GR law), which models the relationship between magnitude and frequency of earthquakes in a given tectonic region. When comparing the statistical similarity between Zipfian distribution and GR law, one important distinction must be made concerning the comparison of frequency and power of earthquakes, and that is found in the Richter magnitude scale itself, in which the scale of measurement is a base-10 logarithmic measurement, in which the amplitude of a given measurement is ten times greater than the numerical measure below it (a magnitude 6.0 quake is ten times greater in amplitude than a magnitude 5.0 quake). GR law predicts that for a given frequency of 6.0 magnitude events, there will be ten times as many 5.0 magnitude events, one hundred times as many 4.0 magnitude events, and one thousand times as many 3.0 magnitude events. To compare this to Zipfian distribution, one must observe the data in the same factors of base-10, in which the 10th rank in a data set would be observed with 1/512th frequency of the first ranked (with ten frequency doublings between the first and tenth rank). What is important however, is not the numbers themselves, but their scale relationship to other values in the data set, and the inverse proportionality which is a feature common to all four power law dynamics. Similarly, the $1/f$ signal or noise (also known as pink noise) can be found widely in natural and social science data sets modeling single-dimensional signals, and has been found in the modeling of physical and biological systems, economics and even musical variations and human speech (see Voss and Clarke 1975). Also referred to as flicker noise in electronic measurement (Hansen 2009) or fractional (or fractal) noise (Mandelbrot and Van Ness 1968), the $1/f$ signal range describes a relationship of inverse proportionality in signals in which each octave of a frequency maintains a proportionally equivalent ratio of noise power as each octave halves or doubles in frequency, resulting in an overall constant power through every point in the spectrum. As the energy increases in orders of magnitude, the frequency changes inversely. This is also the same power law relationship found in fractal structures made famous by Benoit Mandelbrot (1983), in which complex quadratic polynomials tend toward infinity with self-similarity at increasing magnification (Briggs 1992: 80). The most common expression of fractal dynamics can be found in the measurement of geological coastlines, in which the length of the coastline will become exponentially larger the smaller the unit of measurement used to measure it, with true fractals always approaching infinity with the same law of inverse proportionality we find in the other power laws sought and employed by Bak.

Castles made of sand

Bak's chosen model for illustrating SOC is the tessellation structure of a sandpile, in which the slope of the pile builds gradually as grains of sand are added randomly to the pile until the slope reaches a critical threshold (the self-organized critical state) where any further additions to the pile can cause site-specific collapses, cascading to adjacent sites, increasing the value of their slopes, with further cascading collapses or avalanches across interrelated points within the system. Initially, the pile is not in any organised or critical state, but as sand is randomly added, the system moves toward self-organized criticality through periods of punctuated equilibrium – periods of avalanches and stasis – until the critical state is reached, whereby microlevel events such as the adding of a single grain of sand somewhere in the pile, generate macrolevel events in which a critical threshold is surpassed and the entire sandpile distribution undergoes dynamic change. Once the system reaches the self-organized state, it does not organise any further, but continues in a state of punctuated equilibrium where periods of avalanche and stasis maintain the critical state of the pile. It is in this state of self-organized criticality that the inverse proportionality in the above power laws becomes manifest; the great majority of avalanches will be very small in size in proportion to the entire pile. More rarely, larger avalanches will be caused by the addition of a single grain, with cascading critical thresholds being distributed throughout the system. Very rarely, a single grain of sand will cause cascading avalanches of catastrophic proportions, resulting in massive change in the sandpile as critical thresholds everywhere through it are exceeded and the entire system dynamics are altered. If the frequency of avalanches is then plotted against the size of such avalanches, sandpile dynamics result in an inverse power law, where magnitudes of change are distributionally fractal, with nonlinear interdependency throughout the whole pile (the self-organized critical state).

Self-organized criticality is an emergent property of certain non-equilibrium dissipative dynamic systems in which the system itself attunes toward its critical point without the requirement for precise conditions for this to occur. A dissipative system is an open system in which energy is introduced from without and dissipated through the system through its own endogenous processes. Traditional (non-self-organized) criticality (or critical point phenomena; with characteristic features of complexity – power laws, 1/f noise, and fractal scale invariance) typically requires precise variance of control parameters (such as temperature), whereas SOC systems are far less fragile concerning such variable parameters, with the emergence of criticality possible spontaneously as the system attracts toward its critical point through a myriad of simple (non-complex) local interactions.

While SOC has become established as an explanation for a huge range of phenomena in both the natural and social sciences (in such examples as mentioned; earthquakes, biological extinctions, solar flares, traffic jams, the human brain, and economics), as Dooley and Van de Ven (1999) point out, it is simply the expression of a certain type of noise pattern, a characterization of a certain facet or class of natural process, rather than a complete characterization of "how nature works" as Bak contends. The $1/f$ signal, for which Bak spends a great deal of his book comparing different exponent values discovered in various experiments investigating sandpile SOC (through Abelian and other theoretic models, as well as through experiments on various granular matter, such as rice grains in Oslo), is also known as pink noise, for the fact that pink coloured light displays a similar power spectrum. Pink noise shares many of the characteristics of white noise, with the added caveat of a "constrained randomness" which constrains the system away from becoming pure white noise (p 365), with high dimensional variables operating in a non-linear dynamical fashion.

Dooley and Van de Ven, in their investigation into complex organizational dynamics, identify two categories of characteristics of dynamical systems which, in concert, can be used to determine the type of complex dynamic organization a given system will produce, which their analysis concludes will fall into one of four types of dynamical systems; Periodic, Chaotic, White Noise, and Pink Noise. The two determining categories are 1) the dimensionality of the causal system, and 2) the nature of the interaction between the causal factors in the system (p 364). The dimensionality of the system "refers to the number of dimensions of a geometric space that are required to plot all the points in a return map (or phase space) of a time series" (p 360), with the determining characteristic being whether the system has low dimensionality or high dimensionality. Low dimensional systems will exhibit periodic or chaotic dynamics, whereas high dimensional systems will exemplify white or pink noise patterns. The nature of interaction between causal factors in a system falls also into two categories; no interaction or linear interaction on one hand, and complex non-linear interaction on the other. Systems displaying no interaction between causal factors or simple linear interactions between causal factors can be expected to exhibit periodic dynamics or white noise, while systems with complex non-linear interactions between causal factors will tend toward chaotic or pink noise system dynamics. As Dooley and Van de Ven contend however, these dynamics are not necessarily mutually exclusive, and for a given data set, "one might find that multiple dynamical signals are present... therefore, multiple process theories may be appropriate for explaining observed behaviour" (p 364). This is a particularly important point, and a troublesome one for Bak's conclusions, as "without the generation of a causal theory that explains the variation in the observed data, dynamical analysis becomes simply an academic exercise" (*ibid*.).

The real problem for Bak comes in the fact that sandpile dynamics *is* pink noise, by design of the very dissipative system model creating the conditions of constrained randomness that constrain the system away from becoming purely white noise. Dooley and Van de Ven approach the data from a different perspective, and with differing expectations; they seek to generate causal theories for a range of observed dynamics, whereas Bak has effectively designed a model for creating pink noise dynamics, which could have potentially been achieved from the other direction – that is to say, by following the conclusions of Dooley and Van de Ven, designing a model composed of many interdependent factors acting in a constrained fashion, with such constraints being local rather than global in nature (p 367), and perhaps the ideal way to express this or model it would be through the dynamics of a pile of sand made into a dissipative system by forever adding more grains of sand.

Colour by numbers

The power spectrum of a noise signal can be described by the "colour" of its visible texture in spectral profile, often with intended reference to the spectral profiles of colours of light with a similar spectral profile(though not always accurately). Noise in this sense is not strictly of the auditory variety (though it also encompasses this definition), but is the numerical qualia of temporal patterns in a time series with amplitude variation over time (or waveform). And while light and sound are entirely different types of wave, there exist some remarkable correlations between the two. Sound is a result of compressions of waves through a medium, whereas light is the radiant energy of the electromagnetic spectrum. The range of light we see as humans is a very small range of frequencies along the electromagnetic spectrum, with infrared being below the frequency we can detect and ultraviolet being above our native capacities (though some individuals do have the ability to detect a wider frequency of electromagnetic radiation, as do many animals, and these frequencies can also be detected by a range of optical films and devices). In the late 17th century, Newton famously illustrated this visible spectrum in his experiments focusing sunlight through a prism when he demonstrated that white light was composed of seven different colours, which, as we now know, have discernable corresponding wavelengths and frequencies. For humans, there are seven frequencies of colour we can discern, but also seven frequencies of sound in a musical scale, with the first, third, and fifth colours we can see being the primary colours, and the third and fifth notes of a scale forming the major chord on the root (first) note in a musical scale.

The "colour" of a noise or signal is determined by the exponent value for the relative $1/f$ value, where the spectral density of a frequency (graphed as a logarithmic frequency) will display the formula of $1/f\beta$, with the exponent value of β resolving the specific type of noise. Pink noise has an exponent value of β=1 (with the inverse proportionality we have mentioned), whereas white noise (with a flat power spectrum) has an exponent value of β=0, and blue noise has the inverse value of pink noise, with an exponent value of β=-1, with the logarithmic frequency mirroring pink noise (in the opposite direction).

As Dooley and Van de Ven point out, pink noise has a similar generative model form to white noise, resultant from high dimensionality of the causal system (p 365), implying a large number of affecting variable factors, but with a constrained randomness between interactions not found in white noise due to the complex non-linear interaction between the contributing factors. These constraints, which function via feedback loops, are likely to be local rather than global in nature for pink noise systems, as any global or macro constraints "would tend to greatly reduce the dimensionality of the system, and thus not generate pink noise" (*ibid*.). Dooley and Van de Ven cite a study by Stanley et al. (1996) of a high dimensional generative model in which causal constraints operate locally due to a structured hierarchy in which policy propagation through a triangular network is subject to "some probability of modification" as the policy is disseminated through multiple levels of the organizational hierarchy, with random chance modifications emerging due to "local idiosyncrasies," resulting in a stochastic coupling between variables not controlled at a global (macro) level, making for a non-linear dynamical system. In human systems, adaptive responses tend toward linear interactions, where responses are proportional with the change desired by the adaptation (Dooley and Van de Ven p 366; March 1994), unless the adaptive response is strategically competitive in nature, such as in the case of our economic systems. In such a competition driven system, control and cooperation are unlikely to stem from systemic rationality, and responses tend toward disproportionality as members opt for adaptive responses which may provide them an edge over other members (competitors): asymmetric warfare.

It is what it is...?

Despite titling his book "How Nature Works," even Bak himself admits that his theory of self-organized criticality is but one small part of the true picture;

> The sandpile theory explains only one level in a hierarchy. The sand must come from somewhere else – maybe another critical system – and it must go somewhere else – perhaps driving yet another critical system. The sandpile describes only one single step in the hierarchical process of forming complex phenomena. (1996: 99-100)

As Dooley and Van de Ven illustrate, the self-organized critical state is simply the expression of a type of noise rather than a characterization of how nature operates. It is through the work of Dooley and Van de Ven that we can identify the precise dynamical system conditions from which pink noise can be expected: high dimensionality of contributing causal factors with nonlinear interactions between them, "in the case of a human system, that a large number of individuals are contributing to the observed collective actions" (1999: 365) through strategic competition rather than deliberative rationality (366). Pink noise – like periodic, chaotic, and white noise – is generative of dissipative systems, and if Bak's research suggests anything, it is that Nature operates – at least in part – by way of hierarchically organised dissipative systems. As we have contended throughout this discussion, complexity (and semiosis) emerges from co-dependent nested levels of complexity, like Russian dolls, and the narrative cannot be ignored, as seems to be Bak's intention with his insistence that SOC is an argument against contingency.

Bak's proposal that SOC is an argument against contingency emerges as a peripheral argument which he returns to throughout *How Nature Works*, though it is not the focus of his larger argument that "self-organized criticality is nature's way of making enormous transformations over short time scales" (p 61), but is tangential to it. He approaches the topic primarily through discussion of the extinction of the dinosaurs, but also expands the argument in his discussion of human economic systems as operating fundamentally through SOC dynamics, concluding that "the most robust state for an economy could be the decentralized self-organized critical state of capitalistic economics.... with all its fluctuations [it] is not the best possible state, but it is the best that is dynamically achievable" (p 198).

He begins his argument against contingency by questioning the validity of the theory that a meteor impact is responsible for the demise of the dinosaurs, which he contends is based on two major deficiencies. His first contention is that fossil records show that "the dinosaurs appear to have died out at least a couple of million years before the meteorite hit. At the very least, the dominance of the dinosaurs was already greatly reduced at that time" (p 152). Troublingly, Bak fails to cite any references for this claim, and from what little I understand of this area, this is a particularly contentious topic. His second contention follows the first in claiming that "no causal relationship between the meteor and the resulting extinction has been established" and that "all we have are loose, unsubstantiated, speculations about climate change caused by the meteor" (*ibid*.).

His argument, at its core, is similarly speculative, contending that only in an equilibrium linear world would a massive external event be required to explain a mass extinction, whereas in an SOC system such massive "avalanches" as mass extinctions are at the very least stochastically predictable. His argument stops short of actually claiming a meteor strike event never happened (in fact, his first contention would suggest that he is in possession of near-exact dates for when it *did* occur), even admitting that "this cannot rule out that extinction events were directly caused by some external object hitting the earth" (*ibid*.), going on to attempt to reconcile the two positions with a third which holds that a meteor impact could be considered "a triggering event, which initially would affect only a single species or a few species" which then led to a domino effect in which a "mass extinction could only take place because the stage had been set by the previous evolutionary history, preparing the global ecology in the critical state" (p 153).

It is curious why Bak would choose the extinction of the dinosaurs as a premise for his argument against the necessity of contingency, particularly as in his discussion on economics he seems to concede that "the outcome is contingent upon specific minor events in the past" (p 32), while insisting SOC operates according to the same principles in both fields (biology and economics). His take on contingency in economics is somewhat different from his assessment of contingency in history and biology, however, and seems to stem from his appraisal of economics as "imitating a science whose nature they did not understand" (p 185). It is Bak's judgment that economics is theoretically built upon false premises, attempting to imitate hard sciences such as physics, without fully understanding those sciences which they aspire to imitate:

> economists long ago believed that their field had to be as "scientific" as physics, meaning that everything had to be predictable. What irony! In physics detailed predictability has long been devalued and abandoned as a largely irrelevant concept. (p 185)

He instead proposes his own general theory of economics, which, as he says, looks "very much like the punctuated equilibrium model for biological evolution described" (pp 186-7), and in his generalised summary all but removes the influences of contingency, or characterises contingency as itself a stochastic predictability. It is curious why Bak would choose to compose his arguments against contingency in the discussion of a single event in prerecorded (prehuman) history, when so many more examples are readily available (and well recorded) in the history of modern economics. Bak instead makes a distinction between his general theory of economics and what he calls traditional equilibrium economics, concluding that it is only within traditional equilibrium economics that historical contingency plays such a large role, due to the assumption within it that the best product will come to dominate the market (p 157). For Bak, and within the general theory of economics that he proposes, examples of historical contingencies where "spurious historical events rather than the technical superiority of the winning project" (*ibid*.), as in the competitions between VHS and Betamax, or internal combustion and steam engines, are not contingencies at all, but examples of agents seeking to improve their fitness (or utility function) "just as biological species improve their fitness by mutating" (p 187), which then affects the fitness of other competing agents, who must then adjust their own strategies of interaction.

In Bak's description of economics, therefore, adaptive responses are strategically competitive in nature, and nonlinear asymmetric interactions are achieved through the (metaphorically) Darwinian design of the economic system itself which is governing the interactions. Whether Bak's consideration of the economic system through particularly Darwinian metaphorical conception is considered accurate or not, it is this particular aspect of his general theory of economics which determines, according to Dooley and Van de Ven, the dynamic from linear to non-linear complex interactions, providing the very constrained randomness which can be expected to create pink noise within complex dissipative systems with high dimensionality (in the case of human systems; many independent actors). For Bak, it is the entrenched design of competition within human economic systems, guided by a metaphorical conception of Darwinian competition between independent actors, which provides the very constrained randomness which constrains the system from becoming white noise, or in Bak's terms, moves the system towards and maintains a state of self-organized criticality. His conclusions, indeed his interpretation of results, emerge however, from certain ontological assumptions and conceptual metaphorical mappings which lead him to assert that our very economic systems replicate "how nature works."

... But not all that it is

Despite the title of his book, I do not believe Bak was so much arguing that nature *only* operates through SOC dynamics, but that natural dissipative systems *can* spontaneously move toward self-organized complexity, and that there are many instances in the physical and social sciences where we are able to observe such critical point phenomena. The wondrous elegance of SOC systems lies in the possibility of the system to *spontaneously* attract toward its critical point without the need for precise control parameters normally common to critical state dynamical systems – the strange attractor that Bak is suggesting is nature at work, however, can be found in the underlying generative mechanism of the dissipative systems in which this behaviour can be observed. Whether in actual physical dissipative systems or in theoretical or practical models of the same, when the conditions of the identified underlying generative mechanism are fulfilled, the self-organized critical state – or a pink noise dynamical pattern – can be expected as the resultant organizational dynamics. In this case, as Dooley and Van de Ven point out, the underlying generative mechanism concerns the dimensionality and nature of interaction between causal factors, while also describing the other possible dissipative system dynamical patterns that can emerge with different values for these parameters.

If we are to therefore state along with Bak that 'self-organized criticality is how nature works,' we are in fact saying that nature works through high dimensional causal systems where causal factors act interdependently in a nonlinear fashion. But in saying this we must not deny that nature also 'works' with other dynamics, and that the other dynamical patterns Dooley and Van de Ven catalogue – periodic, chaotic, and white noise dynamics – are equally present in nature, and thus also the generative mechanisms which create them, and that nature in fact 'works' in both high dimensionality and low dimensionality, as well as within dissipative systems where causal factors act independently or interdependently, and with linear or complex nonlinear interactions.

Bak argues that it is only within the self-organized critical state that complexity is generated, though he is careful to qualify this as "*so far* the only *known* general mechanism to generate complexity" (p 2, my emphasis added).However, there are other mechanisms through which complexity emerges in nonlinear dissipative systems, such as that which generates Rayleigh-Bénard convection (Bénard cells), in which thermal conductivity spontaneously orders random molecular movement of a heated fluid on a macroscopic level to form symmetry breaking cells of repeated geometrical prisms as the dissipative system moves toward a state of most efficient entropy between the competing forces of thermal conductivity, surface tension, buoyancy and gravity, with the geometry of the prisms influenced by the shape of the system boundaries. Bénard convection cells emerge with the scale invariance of fractal dynamics, but the system does so not through SOC dynamics, but through contracted metastability, where large external influences are required to alter the rotations of the cells once they are formed, though microscopic changes in the initial conditions can produce such macroscopic effects (such sensitivity to initial conditions being a characteristic of complex and chaotic systems).

Bénard convection cells are an example of a general mechanism in nature which creates complexity through dynamics which differ from Bak's self-organized critical state, tending toward chaos as greater energy is introduced into the dissipative system through increased temperature gradient, rather than attracting toward a self-regulated critical state. Bénard convection cells, or more accurately, the Bénard convection process, offers a possible comparison for us if we are to accept such a process as an example of complexity generation in nature. In the Bénard convection process, we discover the emergence of new, higher level forms of order, whereas in SOC sandpile dynamics we find a reduction of order rather than new forms of order emerging. In this, Bak has illustrated a phenomenon by which nature is self-constraining, rather than generative as he claims. This may be due to the simplicity of the sandpile model itself.

Bénard convection cells result from the interplay of thermal conductivity, surface tension, buoyancy, gravity, and system boundaries, whereas sandpiles result from sand, and only sand (under constraint of gravity, of course). It is a drastic oversimplification of all natural systems to consider the interactions of only one type of component. The sandpile model has the potential to become generative, but only if we add a number of other ingredients. If we had access to infinite time and an infinite number of model sandpiles to run experiments on, we might soon become bored with just the one ingredient and begin experimenting with adding other elements into our sandpiles. Perhaps an infinite number of models are set aside to include limestone and water with the sand in infinitely varying ratios. While some would become mostly pools of water, others would look indistinguishable from sandpiles, and others still would generate new forms of order. If we conducted these experiments over geological time periods, with new elements added randomly every several years or centuries, we would eventually witness the emergence of a vast array of complex forms, from pillars, to stalagmites and stalactites, to wave formations, to every geological form witnessed or imagined possible. If we were to alter the way in which gravity constrained the experiment, perhaps by conducting a number of experiments in deep space under the gravitational influence of multiple stars and galaxies and their movements, even more complex forms would emerge over time, potentially mimicking complex shapes of galaxies themselves. Even if we maintained the monoculture of the sandpile and simply adjusted some of the experimental conditions, new forms of complexity may emerge; for instance by adjusting the temperature. If the temperature were to be raised significantly, the sand would first melt and begin to fuse into a liquid glass state, which as we know can be shaped any way imaginable, but as the temperature was further increased the sand would become a gas, with entirely different spatial dynamics and properties.

But Bak's monoculture sandpile only generates a sandpile. A sandpile of sandpiles, for Bak it is sandpiles all the way down, and he was in some way aware of this myopia, as we notice from this passage quoted earlier;

> The sandpile theory explains only one level in a hierarchy. The sand must come from somewhere else – maybe another critical system – and it must go somewhere else – perhaps driving yet another critical system. The sandpile describes only one single step in the hierarchical process of forming complex phenomena (*ibid.*).

It is true that for Bak each grain of sand represented an organism or species in what he felt was a model of evolutionary fitness, but by attempting to model natural generative systems by considering the interactions of a single monoculture component we could never be successful. Any attempt to do so would be such an oversimplification of natural systems as to remove any relation to Nature whatsoever (apart from desert topography, and even then would be such oversimplified isolation as to be of very little use). In Bak's ontology and metaphorical conception, nature is a sandpile of sandpiles. And while his conception removes any requirement for a sandpile maker, it can make nothing more than sandpiles. Sandpiles all the way down.

When is a sandpile more than just a pile of sand?

The very description of a sandpile as a *dissipative system* indicates one crucial requirement of any real or theoretical sandpile model, that the base area is fixed before the first grain of sand is ever introduced. The alternative would be a sandpile model where the base area is allowed to increase as critical thresholds are surpassed and avalanches occur, ultimately precluding consideration as a dissipative system. Dissipative systems, in increasing their internal order, increase their own production of entropy. This is only possible through the ability of the dissipative system to continuously "export" this entropy to their environments. A sandpile where the base is allowed to expand with every collapse dissipates its internal stresses *internally*, through redistribution of the stresses and thereby altering the constraints upon constituent sand grains (ignoring the increase of pressure upon any supporting surface), and also internally through the process of collapsing. A collapse, or avalanche, decreases the sandpile in order, but there is no process by which the sandpile exports entropy to its environment (except, insofar as in its collapsed state it has a larger footprint on the supporting surface). In this, the collapsed sandpile *retains* its accumulated entropy.

The corresponding phenomenon in a system of Bénard convection cells would be the collapse of the cell structure, perhaps because the system is receiving less heat from its environment. This would also be a cessation of the *dissipative* character of the system, but for a different reason than with sandpiles: the system ceases to be dissipative because there is no longer increased entropy being generated needing to be exported to the environment. The system no longer has a need to export so much entropy because it is no longer receiving so much heat from its environment. The addition of grains of sand to a collapsed pile with no restriction on base area is like the introduction of heat to a fluid system which has not yet become a dissipative system . However, when the fluid system reaches criticality, it increases its entropy production *and* the exportation of that entropy to its environment, whereas the sandpile retains its increased entropy within it as it approaches and achieves criticality.

If the base area of the sandpile is fixed, however, then sand grains which tumble off from the pile leave the base area of the sandpile and are no longer deemed part of the system, and are thus deemed to have dissipated to the environment. It is only with this fixed base area that a sandpile may be considered as a dissipative system, for with an unconstrained base area the system cannot be so considered dissipative, but is instead growing with the addition of each new grain of sand. There is also a third type of sandpile system which Bak and his associates employ in their experiments (such as using rice grains in Oslo) where the system is entirely isolated and not whatsoever dissipative in character. It may be noted that the purpose of these particular experiments was to investigate the character and ratios of collapses within the pile and other variables were attemptedly removed by perpetually maintaining the critical slope of the pile by having the sandpile within a rotating sealed tube where the movement of the tube replaced the addition of further grains of sand. This isolated system could never, of course, be considered dissipative, as it is not an open system and neither receives energy from its environment, nor exports anything to its environment.

We must therefore be careful regarding the type of sandpile we (or Bak) refer to, as we can be talking about completely different types of systems, particularly when we are investigating systems with the potential for generation of complexity. If we are to examine the quote we have already referred to, however, it is clear that Bak was well aware of these distinctions, and that non-dissipative system models of sandpiles are employed for their ability to isolate for study particular characteristics of sandpile dynamics, such as ratios of frequency to scale of avalanches, and that only the fixed base area dissipative system model sandpile models the behaviour of a natural dissipative critical system with the potential to generate complexity. As Bak notes, "The sand must come from somewhere else – maybe another critical system – and it must go somewhere else – perhaps driving yet another critical system." While non-dissipative system models of sandpiles are employed by Bak and his associates, this is done to model isolated characteristics of the larger sandpile model itself.

Sensitivity to signals

There is one further problem with sandpiles that is worth considering, particularly from a biosemiotic perspective: the sensitivity of systems to signals produced by dissipative systems. As Bak notes in the quote we keep returning to, "the sandpile describes only one single step in the hierarchical process of forming complex phenomena," which he imagines a number of times as sandpiles of sandpiles, each system drawing from and feeding into others as critical thresholds are surpassed. But there is one large problem with this Escherian hierarchy of sandpiles arranged like champagne flutes stacked at a wedding centerpiece that presents for a biosemiotician, which may evade the notice of a physicist more comfortable with models using spherical cows.

That Bak raises the metaphor of the spherical cow illustrates his awareness of the over-simplicity of his model, and the potential blind spots which may hinder any perspective derived through such an oversimplified model. Bak's cognizance of his own tendency as a theoretical physicist to condense description of the real world as efficiently as possible through simplistic modeling unfortunately does not elevate him above such a position, and while he seems to be aware of the potential for problems which may (theoretically) arise as the result of such a perspective, an actual such problem seems to have gone unnoticed for Bak concerning a fundamental aspect of the emergence of complexity within dissipative systems: the emergence of systems sensitive to the signal states produced by dissipative systems.

In addition to the Bénard convection process discussed above, another example of complexity generation can be found in a class of reactions in non-equilibrium thermodynamics which result in a nonlinear oscillator, such as chemical clocks and pendulums, and the Belousov-Zhabotinsky (B-Z) reaction. These reactions provide interesting examples to contrast with SOC sandpile dynamics for several reasons. As a chemical model of nonequilibrium biological phenomena, such oscillating reactions remain far from equilibrium for significant lengths of time, and can be found in all living systems, providing a model of complexity generation more realistic than spherical cows (and quite possibly sandpiles). Such oscillating reactions were first thought to violate the second law of thermodynamics, in that the reactions did not appear to move smoothly toward equilibrium, instead seeming to move through equilibrium like a pendulum, as kinetically competing intermediaries cause oscillations which maintain the reaction far from equilibrium until the reactant is exhausted. The oscillations which result of a competition between processes only occur far from equilibrium, travelling toward it, with the reaction only reaching equilibrium when all reactant is exhausted by all the bromine (in the case of B-Z reactions) being consumed through the competition of processes. Rather than violating the second rule of thermodynamics as initially thought, it was discovered that the law is obeyed, but with a modification that the movement toward equilibrium does not always occur smoothly.

In both the Bénard convection process and the many variants of the B-Z reaction, we discover the emergence of more than just a state of criticality, we find the emergence of sensitivity within these dissipative systems; sensitivity to signals of state change both endogenously within the system, and signals from other dissipative systems and the system environment. Much like the receptor queue and effector queue of the tick, signals propagate within these systems *as* the transfer of information, and are responded to with state change in the systems themselves, and function, if not through *Umwelten*, through biosemiosis. And this is conspicuously absent in sandpile dynamics. Bak asks us to imagine the emergence of complexity within nature as a hierarchy of critical systems – of sandpiles – each discrete dissipative system driving the next in turn. But his ideas on this extend, expectedly, into fractal dimensions where each grain of sand of a given sandpile may itself be considered a sandpile, itself exhibiting SOC dynamics. The problem with this conception arises when we consider a single sandpile of sandpiles within this construction. Each constituent grain of sand (which, is itself a sandpile undergoing SOC) can never be anything more than a grain of sand to the sandpile it composes. Regardless of the system state of that component grain's sandpile, there is never a change in state for the pile qua sand grain. Regardless of whether the pile is in a state of criticality or avalanche, punctuated equilibrium or stasis, the larger pile is never sensitive to any of these states, and can only present to the pile as a grain of sand, with the properties of a grain of sand. The criticality of the component elements within the hierarchy does not drive another critical system because the entire meta system has no sensitivity to that state of criticality. Sandpile SOC simply lacks any form of biosemiosis or transfer of information.

Homo economicus shrugged

In his closing discussion on economics, Bak clarifies his position in that he believes SOC dynamics is simply one way in which nature works when he characterises and equates free market capitalism with SOC dynamics, in his summation that "the self-organized critical state... is not the best possible state, but it is the best that is dynamically achievable" (*ibid*. 198). Bak's general theory of economics, whether it accurately depicts the present system or not, does not serve people as beneficiaries of the market at all, but only serves to foster competition. Any notion of the market resulting in the best products for consumer need or use is cast aside as quaint in the face of Darwinian competition. The obvious problem with this position is that the economic system, as an emergent aspect of human culture, only functions for the purposes of competition for dominance of the same system, with participants serving the system rather than the system serving the participants. Bak's conclusions and experimental interpretations, particularly concerning economic systems, emerge from certain ontological assumptions and conceptual metaphorical mappings that see our economic systems as a replication of what he interprets as natural processes. Instead, economics emerges at the human level of semiosis and complexity and has no direct equivalent in nature.

Economics involves metaphor originally abstracted from experience, reapplied in abstract description of the world, becoming oblivious to its metaphorical origins. It requires narrative to understand this process. It is not naturally emergent, but emerges from its own metaphor – its own self-contained logic and internal dynamics, with metaphoric entailments strengthened by removing reference to its place within an emergent hierarchy.

*

Though Per Bak is a theoretical physicist rather than a philosopher, he was no doubt acutely aware of the philosophical ramifications of his work, and had a particularly philosophical conception of the role of science;

> Perhaps our ultimate understanding of scientific topics is measured in terms of our ability to generate metaphoric pictures of what is going on. Maybe understanding *is* coming up with metaphoric pictures. (p 50)

His statement, of course, concerned his departure from pendulums to sand piles for illustrating his model of SOC dynamics, though it contains a greater relevance for our particular investigations of the larger topic. In the preceding chapter we discussed at length the power of metaphor to influence the creation and conception of our realities, and serve to guide our actions and perceptions, whether we are fully aware of the process or not. Bak's take on contingency is particularly enlightening concerning the metaphoric entailments and inferences which influenced his conceptions and conclusions. In his discussion on economics, and his sketch of a general theory of economics which he felt was necessary, Bak sought to diminish the role of contingency and historical emergence to a stochastic probability, with the advent of contingency itself seen as merely the effort of a constituent to increase their utility function. Bak's assessment identifies two types of contingency; contingent external influences (such as a meteor impact for the dinosaurs), and agent-driven contingencies caused by individual agents seeking to improve their relative position within the ecosphere or marketplace "just as biological species improve their fitness by mutating" (p 187).

These two types of contingency he seeks to diminish in distinct ways. The first type of contingency he feels is diminished (if not refuted) by SOC dynamics in two ways; firstly, by the self-organization of the dissipative system itself, which spontaneously approaches its critical state even after catastrophic change. Whether a massive avalanche in the sandpile (actual or metaphorical) is caused by internal SOC dynamics or external influence on a scale which dwarfs the sandpile itself, if the dissipative system is maintained (if more grains of sand continue to be added to the pile), it will eventually reach the same state again, and will continue to attract toward its critical state. If anything, Bak elevates the resilience of the SOC dissipative system above the capacity of external influences to do much more than speed or slow the dynamics of the system itself, and there is little consideration given to the precise generative conditions that even a sandpile requires. The second way in which Bak refutes the first type of contingency is to suggest it is simply not necessary for any explanations concerning or surrounding SOC dissipative systems. Rather than *requiring* the advent of a meteor impact which drastically changed the climate and led to the mass extinction of entire species, SOC systems can be stochastically expected to undergo such mass extinctions , ever so rarely, through its own dynamics. Further, his suggestion is that such externally driven catastrophes are subsidiary to SOC dynamics, with external influences mere "triggering events" where "mass extinction could only take place because the stage had been set by the previous evolutionary history" (p153).

The problem with Bak's attempts to diminish or refute the first type of contingency is that he seeks to restrict consideration of the topic to the material and formal causes only, and removes all historicity. Firstly, the history of how the dissipative system came about cannot be ignored, as even though SOC systems are resilient in some senses, in other ways they still require goldilocks conditions to be possible at all. Bak, does, of course, admit this in other places;

> We arrive at the conclusion that complex life can only emerge at a cold place in the universe, with little chemical activity – not a hot sizzling primordial soup with a lot of activity (p 144)

And by his admission the critical system must be considered only one level in a system, perhaps nested within an hierarchy of critical systems. Even within the methodology of experimentation, there is a narrativity at work which goes seemingly unnoticed by Bak. When observed through the lens provided by Dooley and Van de Ven, this becomes even more clear, in both the underlying generative conditions of the state itself, and the other possible dynamical conditions which can result from variations in those underlying generative conditions. Perhaps due to their own metaphorical perspective, perhaps due to their orientation towards organizational dynamics, Dooley and Van de Ven by contrast emphasise narrative emplotment throughout their discussion. While SOC systems are resilient enough to self-organize without some certain precise conditions, other precise conditions *are* required, such as those which might affect the underlying generative conditions of such a system, changing it into another possible dynamic entirely. It is not enough to remove contingency at one level, only for it to emerge as all four causes at the level just below it. It requires narrative to understand these processes.

The second type of contingency Bak seeks to undermine is that which comes from within human systems and is behavioral. Instances, such as in the marketplace, where a product gains dominance of the market for reasons other than being the superior product, for Bak, are simply further expressions of actors seeking to improve their relative position, and should be treated as any other event within a time series. Rather than the market being conceived as a human-emergent system functioning to fulfill the complex needs of interactions between humans, governed by laws which also seek to serve the same, the normative inference is that the market mirrors a conception of nature as "red in tooth and claw," where strategies of deception are rewarded, as camouflage might be for predator or prey. This metaphorical elaboration entirely ignores the collaborative community on which the complex interactions between humans itself emerges, that human culture is fundamentally reciprocal. As we discussed in Chapter 3, human ethics emerges from the cultural human lifeworld where each individual is a subject among other subjects, necessarily collaborative. As discussed earlier, human adaptive responses will tend toward linear interactions, with responses proportional to the change elicited by the adaptation, except in situations where the adaptive response is strategically competitive, in which case such responses will tend toward disproportionality. Just as Bak's sandpile model could have been derived in reverse from the work of Dooley and Van de Ven, human behaviours where individuals seek to "improve their fitness" through strategies of deception are generative from the very system design itself, regardless of the origin of that system.

In the key of discordance

Bak's metaphoric conception of economics, it would have to be said, is quite a popular one. That economics itself has been elevated by Bak and countless others into the realm of such natural sciences geology and biology is itself telling of the reverence we have toward systems that we often forget, we have created. As natural emergent phenomena within nature, it is assumed that whatever emerges from human culture and mind will mirror that same Nature from which we emerge, but this is to ignore the role of mind itself in such creation. Mind is developed such that it is able – perhaps for the first occasion in the hierarchy of complexity from which it emerges – to ignore the semiosis from which it emerges, and on which its emergence depends. Just as we can design systems to serve us, we can design those systems in ways that also undermine us and other systems we depend upon.

Our economic systems have no equivalent within natural systems. Granted, certain animals amass what might be considered forms of token wealth for the purposes of courtship and mating, but as a representative of value, money has no equivalent within nature. As a representative quantity or value, nothing in nature is capable of standing in for literally anything else representationally or semiotically. Every representamen has a specific purpose with regard to its inherent or perceived value, with such values a direct result of an organism's *Umwelt*, and relate to primary directives of the continuation of the organism (maintenance of conditions and reproduction), while money is pure simulacra. As a medium between signs, money must be considered a thrice removed signifier, and it is sandpiles all the way down.

*

In this final chapter of section two, we have concluded our investigation into what it means to be human with a sketch of the contemporary human semiotic condition. As homo economicus, we have elevated in priority our own human level semiosis to the degree that it is altogether discordant and dissonant with Nature's semiosis. In the final section to follow we are now in a position to present the Peircian architectonic as a possible framework of resolution for the problems surrounding our semiotic dissonance, and as a means of overcoming our current ecological crisis.

Section 3

Meaningful Existence

In this final section, we will be presenting the Peircian architectonic and Peircian cosmology as a means of overcoming the semiotic dissonance we have presented as the central problem of this thesis. We begin in Chapter 8 with a presentation of the Peircian semeiotic, distilling the essence of his universal categories down to their most accessible formulations, while attempting to show the development of these ideas over the course of C. S. Peirce's own life. In Chapter 9 we develop these ideas further with the presentation of Peirce's objective idealism and the associated doctrines of fallibilism, synechism and tychism, presenting an alternative cosmology infused with a naturally emergent and essential developmental teleology, the *Cosmic Conatus*. In Chapter 10 we respond to objections to the Peircian architectonic, particularly to objective idealism and its grand claim that all matter is simply mind, hidebound with habits. Finally, in Chapter 11 we question what normative insights for human life and ecology may follow from the preceding developmental teleology, and finally present our case for our contention that existence is infused with meaning and purpose, and as self-reflexive, self-aware, minded beings, it is our glorious privilege to play a deciding role in the very *drama of creation* here and now.

CHAPTER 8

From Umwelt to Reality: A Cosmos of Signification

"All the world's a stage..."

- Shakespeare 'As You Like It' Act II Scene VII

With the ground covered behind us, we are finally in a position to present the Peircian architectonic we have proposed as a means of overcoming our own human level semiotic dissonance, and addressing our current ecological crisis. In presenting the Peircian semeiotic, we have made effort to distill the essence of Peirce's life's work down to its most accessible formulations, in attempt to offer the reader several paths to understanding the universality of the Peircian categories.

What is a Sign?

What *is* a sign?

It seems a strange question to ask for a number of reasons, let alone at this stage of a discussion that contends, along with Peirce, that the entirety of existence is "perfused with signs, if it is not composed exclusively of signs." Further, where do we even begin with such a question, particularly in light of some of the perspectives we have already covered in our discussion? As Peirce contends in his own discussion on the topic (*§2 Grand Logic*, 1894), this is a question "calling for deep reflection," particularly as "all reasoning is an interpretation of signs of some kind" (p 4). Let us therefore proceed at a cautious gait.

So, what is a sign?

Well, everything can be a sign, really, but then that doesn't appear to say anything useful does it? Such a totalizing statement leaves us in no better a position to know anything at first glance, so we may have to shelve this idea for now and return to it when we have sufficiently made the case for what, as a cursory proposition, seems to offer very little ontologically or epistemologically. As I will argue further in this chapter however, this statement in fact provides a wealth of both ontological and epistemological guidance for a process metaphysics of emergent embodied becoming through the autonomous generation of novelty – the "intentionality" of life itself. This is the idea we will be working toward in this chapter, beginning with the groundwork provided by C. S. Peirce.

Thinking in threes

Being the son of Harvard mathematician Benjamin Peirce (whose nickname was "Function" Φ Peirce), it is no surprise that Charles Peirce had a penchant for mathematics, his early philosophy and metaphysics reflecting his privileged Massachusetts upbringing and the prejudices of his father, a particularly Moderate Enlightenment-derived position of social and logical stratification. It is unclear at what precise point C. S. Peirce's thinking became entangled in triads (though we know from his own words; "I am forced to confess a leaning to the number three" (1887-8: 247)), but I like to think the bulk of his practical life's work contributed to his enthusiasm for threes. The largest part of his working life was spent with the United States Coast Survey (USCS, US Geological Survey/ US Geodesic Survey; USGS) , where he swung pendulums investigating local variations in Earth's gravity. At twenty, Charles was given the appointment of "Aid"(later "Calculator" and "Computer") on the Coast Survey (1859/1861, From "My Life Written for the Class Book," *Writings of Charles S. Peirce: A Chronological Edition*, Volume 1: 1-3), largely due to the great influence of his father, where he began swinging pendulums.

It was during this particular eight years of Charles' twenties (1859-1867) that he developed his own philosophy, orienting away from the primacy of mathematics of his father and his formative education, advancing the rudiments of his pragmatism (pragmaticism) in his "pedestrian" fashion. During this time, Charles worked with the US Coast Survey, with his first official appointment in 1861 as an Assistant Computer, a position which afforded him exemption from the Civil War draft, though it must be said he spent at least as much time on his various studies, and he failed to submit the majority of reports of his research and calculations, a habit which would follow him throughout his entire employment with the USCS/USGS, and which would cost him future employment shortly following the death of his father.

There may have been something in the methodology of swinging pendulums that perhaps influenced Charles' thinking in threes. The procedure involved determining a value for acceleration due to local variations in Earth's gravity, which could yield an equation for $\boldsymbol{G}$ itself, and help explain possible variations from the value of 9.8 ms^{-2}.

There is a certain poetry in the apparatus itself which would have been Peirce's most used tool beyond pen and paper, in that the pendulum is suspended from a balancing tripod of more than twice the length of the pendulum itself (which was a meter or longer in length), three grounded points of reference required for the free activity of the pendulum itself (and through that, gravity itself) to become manifest. For Charles, who had deeply studied Schiller's Aesthetic Letters from 1855, the artistic beauty of this idea – itself a dialectical interplay between form and possibility or potential; the swinging of pendulums an expression of *Speiltrieb* (the "play drive"), the liberating force of aesthetic function – would not have been lost.

We may also conjecture an act of sorcery performed upon the formative mind of young Charles, in that as he measures and observes the swinging of the pendulum, at different stages of the process, the tripod from which it is suspended is presented and removed in succession from consciousness. Before an accurate length of the pendulum can even be measured, the three legs on which it stands must be erected meticulously and precisely, but once the pendulum is measured and the timing of its swings commenced, the architecture of the system and its construction dissolve into just the movements of the pendulum itself, through which gravity can be observed. The triadic structure whereby the pendulum becomes possible is a framework which presents and continuously re-presents to Charles throughout his investigations of gravity, as it acts upon his pendulum.

The study of gravity itself, as Charles would have felt, is many times removed from its object, and this eight year period of Charles' life encompasses the period where he would also develop his pragmaticism based on the idea "that scientific laws do much more than summarize existing knowledge, they lead to new knowledge" (Brent 1998: 68). This removal of epistemology from its direct object, and the awareness of such a remove, rather than frightening or discouraging Charles, provided what he saw as his greatest challenge. Further is the peculiar local variations of gravity which were the proper object of Charles' study, the strange local character of gravity itself, the value for which varies between 9.782 m s^{-2} at the equator and 9.832 m s^{-2} at the poles, whereby local variations can be *very* local, and the value of ***G*** reduces with altitude, and must be deduced through its localised *signal*.

In swinging his pendulums and doing his computations, Charles would have been all too aware that his primitive apparatus only ever allowed him to interpret the *signs* of gravity. That such a sign preceded its discovery is obviously fundamental to the cosmology Peirce would come to develop, to both his pragmaticism and his semeiotic, but what I suggest may have played just as fundamental a role in his understanding was the relationship of the apparatus to his access to just such a sign: that his experiments were ever suspended from the ultimate framework of a triad, the consciousness of which for Charles must have pulsed as it forever shifted between the foreground and background in his meticulous work. What we can say for certain is that it was not until May 14 of 1867, "after three years of almost insanely concentrated thought, hardly interrupted even by sleep" (Peirce 1905, *Collected Papers* 8.213) that Charles produced what he considered his "one contribution to philosophy" (*ibid*.) in his *New List of Categories*.

Semeiotic

Peirce proposed a reformulation of the understanding of sign systems in the form of The Categories. While The Categories themselves went through many permutations over the course of Peirce's own life (expanding into sub-categories within sub-categories, though not ad infinitum), the concepts of Firstness, Secondness, and Thirdness are at the core of Peircian Semeiotic.

Peirce, like Kant, begins with the position that the function of cognition is to unify the information brought to us empirically, through the senses. He further proposed that Kant's method, to be properly conducted, would require "the invention of a perfectly exact, systematic and analytic language in which all reasoning could be expressed" (*Notes on the Categories*, 1885: 237, *Item 34 §1*). Using this synthetic fictional language as a means of experimentation, Peirce deduced that such a language would contain only monadic, dyadic and triadic predicates, that is, expressions of valencies of one, two or three, but never more than three. In these sorts of expressions, in a language thus restricted, we can equate these relations of expressional valency with Firstness, Secondness and Thirdness, respectively: these are Peirce's universal categories. Not to deny that there is in fact any relationship, or conjecture which can exist which appears to have more than triadic interrelation with other elements and signs, but that such complex facades may be unravelled with logical analysis down to a complex multitude of monadic, dyadic and triadic relationships, and that this system of representation and interpretation is our only means of knowing anything.

Firstness is the Thing In Itself, while Secondness is our perception of it. Thirdness is our own mediation between Firstness and Secondness, and is all we can really discuss, as

> Apart from inquiry, 'reality' is a meaningless concept. 'Existence' is a matter of Secondness only, reality is an affair of Thirdness as Thirdness, that is, in its mediation between Secondness and Firstness. (CP 5.121)

Accordingly, notions of such things as cognition, intention, and teleology are irreducibly triadic, existing in the realm of mediation between Firsts and Seconds. Our access to any sort of Firstness is always mediated and thus a synthesis. This creates the problem for any metaphysical inquiry, stated in its simplest, that existence itself is not strictly intelligible. Peirce writes (*ibid*. *Cf* CP 6.340, 6.374, 8. 266);

> Existence per se is not intelligible. It is experienced, rather than cognized, as the brute, irrational insistency or Secondness of individual things.

It is most important to understand that for Peirce, all thinking, one could say every relationship in existence, occurs within signs and the interpretation of signs. In this, primeval reality, *Firstness*, experienced only through its *Secondness*, and the *play of musement* it foists upon the processes of mind in demanding interpretation of its signs and instances, inspiring the process of competitive abduction. The heart of both Peirce's fallibilism and his pragmaticism, competitive abduction, much like the process operative in the mind at the outset of (or at any point within the course of) a game of chess, occurs when the mind is accosted by a reality insistent upon interpretation. Many possibilities are offered up from within many parts of mind and being, all subject to the *drive* (*play drive* - *Speiltrieb*) itself (and the mind's division of itself through various stages of self-intuition), as signs are absorbed and processed, interpreted and engaged.

By 1894, after more than a quarter of a century of lectures and papers on his semeiotic, Peirce returned to a particularly Kantian method of explanation and enquiry, explaining The Categories through states of consciousness.

Three different states of mind

Peirce, particularly in his earlier work, has a unique impenetrability, almost a feeling that he is always trying to prove that he is smarter than everyone. This is evident in a number of surviving examples of his submitted work at Harvard, where, despite graduating only 79th out of 90, he regularly insulted the very questions he was tasked to answer, and always wrote as if he had something to prove. By 1894, Charles, resigned from the Survey (1891), his father (1880) and mother (1887) passed on, having attained no permanent position in any institution (and it must be said, after his intense reading of Schelling in 1887), Charles' writing went through a noticeable change of clarity, an almost reaching out to his audience.

In *What Is a Sign?* (1894), Peirce asks us to imagine a person in three different states of mind. At this point stepping past the intricate complexity of his earlier formations, Peirce in his fifties offers us a Kantian (and Aristotelian) path of understanding into his universal categories. *Icon*, *Index*, and *Symbol* are reconceived in purely phenomenological terms as *Feeling*, *Reaction*, and *Thinking*. In this, we begin with *Feeling*, which Peirce asks us to imagine as a person in a dreamy state, thinking of nothing beyond perhaps a sensation of colour. Not considering it directly, "but just contemplating it as ... fancy brings it up" (p 4). In this, the focus of the *Feeling* is changed not according to any rhyme or reason but simply by the "play of fancy" of oneiric phenomenological consciousness. *Feeling* is then the operation of one *thing* upon the consciousness; a presence to the mind without reference; a presence in the *present*. To understand *Reaction*, Peirce asks us to imagine a mind then interrupted from such an oneiric state by some sort of stimulus such as "a loud and prolonged steam whistle," which alarms the consciousness into a response; "he instinctively tries to get away; his hands go to his ears;" the sense of acting and being acted upon our assurance of the reality of things "both of outward things and of ourselves" (*ibid*.). Where *Feeling* is the operation of one thing upon the consciousness, *Reaction* does not reside in any one

Feeling, but "comes upon the breaking of one feeling by another feeling. It essentially involves two things acting upon one another" (p 5). The third state of mind is *Thinking*; an awareness of learning. *Thinking* is entirely different from the other two states of mind in that three things are now involved, where one thing stands in as a *means* or "middle between two others." *Thinking* is irreducibly triadic, and "involves three states of Feeling."

In this phenomenological conception of The Categories, we are provided an entirely different vantage point from which to begin an investigation of the relationship of subject to object than we are left with by Kant, in that before we can even consider a *thing*, we do so from a position of acknowledged mediation; *thinking* of a *thing* involves three states of *feeling*. Peirce then proceeds from this position to contend that in this state of triadic mediation, there are further "three kinds of interest we may take in a thing." That is, once a *thing* is brought to the triadic mediation of thought, it presents in one of three ways, which Peirce considers as the interest we may have in a thing; we may have interest in it *for itself*, we may be interested in its secondary properties, "on account of its reactions with other things," or we may have an interest in it as a *representation*, "in so far as it conveys to a mind an idea about a thing." When we begin *thinking* about a *thing* then, we are doing so (to begin) at a *Thirdness* of a *Thirdness*: we are thinking in signs. And there are further three kinds of signs. Thirdness pours upon us through every avenue of sense. (*The Nature of Meaning*, 'Selected Writings Vol 2, p 211)

Icon, Index, Symbol

Here it will be necessary for the sake of clarity to prune some of the variety of the terms used by Peirce for his distinction between *Icon*, *Index* and *Symbol*. '*Icon*,' for example, is at times substituted with '*Likeness*,' as is the case in the 1894 work *What Is a Sign?*. Elsewhere, Peirce also uses *image*, *diagram*, *metaphor*, and *analogy* in place of *Icon*. The choice to use Icon, Index, and Symbol is not out of any particular belief that these terms are more appropriately descriptive, but because they are the most enduring, and most commonly used by Peirce scholars and commentators when discussing this central trichotomy.

There are three types (or kinds; classes) of signs; Icons, Indexes, and Symbols, with various uses afforded each type of sign. Icons are representations through imitation, Indexes *indicate* something through a physical connection, while Symbols become associated with their meanings by usage, progressively emerging through the course of real history. A parallel with these types of signs may be found in the real history of the evolution and development of human writing systems; from the pictographic ideogram which coveys meaning through visual resemblance of logographical writing systems (Icons), through Sumerian cuneiform and proto-literacy (Index), and into a purely phonetic alphabetic system (Symbol).

A sign (its type, class, or kind) is determined by the nature of the relation of the sign to its object. In the case of an Icon, the sign relates to its object through similarity or resemblance. It is worth noting, however, that this resemblance, similarity, or likeness, must be representational, and not a direct physical correspondence, as is the case with photographs, which must, by their physical connection, belong to the second class of signs, being direct indicators of an object or its qualities. An Icon then, is just as much a vague impression as its phenomenological equivalent of a *feeling*; in terms of speech, Iconic communication is that as between "two men who know no common speech, thrown together" (p 6), which aside from direct reference through pointing would consist in imitative sounds, gestures and pictures (perhaps drawn in the sand), looking for some shared realm of common experience. This is not to confuse such *vagueness* with simplicity (or a lack, or absence, of complexity) or reductionism, however. One of the key aspects of semiosis, which we will be exploring shortly, is non-linearity of transfer (be that of energy or "information," as detailed below), and even a vague Icon can be an artefact of vast complexity. An Icon may take the form of an image, diagram or metaphor. As Brent (1998: 353) writes,

> A physical map is a complex icon of the diagrammatic kind in that it *represents* a terrain by conventions involving lines representing boundaries, cities, bridges, rivers, elevations, etc. Other maps might use other conventions to show population, resources, ethnicity, etc..

An Icon is determined by its relationship to its object being one of similarity or resemblance, though we may say, along with Peirce, that "pure likeness can never convey the slightest information" (1894: 7). Peirce elaborates on this position with the seemingly paradoxical statement that;

> No combination of words (excluding proper nouns, and in the absence of gestures or other indicative concomitants of speech) can ever convey the slightest information (*ibid*.).

To explain, Peirce asks us to imagine a conversation between two people (A and B), wherein A acquires information from B which is of no content without rendering through (indexation to) embodied experience of the world:

> B. The owner of that house is the richest man in these parts.
>
> A. What house?
>
> B. Why do you not see a house to your right about seven kilometres distant, on a hill?
>
> A. Yes, I think I can descry it.
>
> B. Very well; that is the house.

There is nothing here, however; no informational content, which A can convey to any other interlocutor without further reference to the embodied experience of both. For A to then convey what he has learned from B at some point in the future to C, requires a whole new set of references to experience shared by both A and C with regard (at the very least) to their spatial and temporal orientations. Unless A is to exist forever in the very place he encountered B, reference must be made to the location (both in space and time), not only with reference to the relative position of C, but the embodied experience of C. If A were to have travelled a great distance before encountering C, such spatiotemporal referents would take a very different form than if A had met C in much the same place as B, or perhaps even on the other side of a mountain which would obscure view of the house in question. At a close distance, A may have much the same conversation with C as between A and B earlier, with reference being made to their *shared* embodied experience and specific reference to the house, if it were still visible. On the other side of a mountain which would obscure the view of the house which to specifically reference through gesture and direct indexation ("Why do you not see a house...?"), reference to the mountain itself would be required, and only then could A impart to C information regarding the wealthy man or his house, or the hill on which it can be found, which to C would be indexed to the mountain itself, and what is hidden by the side he is familiar with. To travel further away would require either reference to a map known to both A and C, or failing that, reference to merely shared ideas of general categories of such things as parts or localities, hills, houses, wealth and men: A to C. There is a place with a house on a hill where a man lives who is wealthy compared to those in his vicinity. Without iconic or indexical reference to a shared embodied experience, no information can ever be conveyed.

An Index is a sign which relates to its object through connection or approximation and indicates or points to its object. Index, or *Indication*, "stands for its object by virtue of a real connection with it, or because it *forces* the mind to attend to that object" (*Of Reasoning in General*, 1895: 14, *Article 7*; *my emphasis added*). A sign may at once be both an Icon and an Index (1894: 8), as may be the case with a map: Let us imagine that A brought a sufficiently accurate map of the area in question along with him on his travels, and encountered C on an entirely different continent. Let us further suppose that C had never left his particular home continent, and had no familiarity with the geography of the location so mapped, though he does have a familiarity with the mapping conventions used and the knowledge of how the representations stand in for the object of representation (the area mapped). For C the map would be an Icon only, while for A, the experience of the world "renders the map something more than a mere *icon*, and confers upon it the added character of an *index*" (*ibid*.).

It is in the character of Indices that we find "the brute, irrational insistency" that is the heraldry of Secondness: it is that which *forces* the mind to attend the object of its representation. "Anything which startles us is an indication, in so far as it marks the junction between two portions of experience" (*ibid*.). The map *becomes* an Index to A as he beholds it and recognition is foisted upon him – from without through the representation presented to him, and from within as his recollections confer experience of that being represented. If A had made a mark on the map to show the location of the home of the wealthy man, the mark on the map would *force* the recollection of the home on the hill (and quite possibly the conversation with B) upon A every time he beheld the map so marked.

The relation of an Index to its object can, again, fall into one of three categories of orientation: referential, causal, and as a label (or proper noun pronoun). A referential Index is that which calls upon the observer to establish a connection between the sign and its object through his own embodied experience: a pointed finger which draws an imagined line between the pointer and the object pointed at, or use of demonstrative pronouns, such as "this" or "that," or even relative pronouns such as "who" and "which" when in reference to subject matter which has already been discussed in a dialogue. Such Indices may refer to relations or groups of relations; "above," or "to the right of" and are capable of complex abstraction and relations of relations. Causal Indices are signs which function like a windsock: not only is a windsock an *indication* of the direction and force of the wind, but the form the sign itself takes is both in the form of, and resultant of, the wind which causes the sign. The sign the windsock takes is the *actual* direction of the wind, the force of which is conveyed by the rigidity of the fabric of the windsock in real time as a sign of the wind itself, and an observer of the windsock is "forced by the law of mind to think that direction is connected with the wind" (1895: 14, *ibid*.). Finally is a label Index, wherein to speak a name or proper noun (in the mind) *points to* the individual (object), so long as such an association existed in the mind separate and preceding the advent of the sign itself. The Indexical sign, however, functions as the same representamen regardless of the effect of the sign upon the purely mental association of its receiver; that is, even when the sign's interpretation is mistaken (a name is unknown) or even impossible (a name is unknowable, or a translation impossible), the sign itself functions as the same representamen. Further, such a label Index is lexically and logically always open to substitution, as in the case of the story we have been following, where A, B, and C offer convenient substitutes, both logically and lexically, where an object is *factually* connected with its sign, but through no conveyance of information; a form of sign Peirce terms a *Degenerate Index* or *Monstrative Index* (*The Categories Defended*, 1903: 172), as opposed to an *Informational Index*.

Finally we have a Symbol. If we find in Secondness the prevailing character of " brute, irrational insistency," We find in Symbol the prevailing character of Thirdness – the "intentionality" of life itself. Symbols *grow*:

> Symbols grow. They come into being by development out of other signs, particularly from likenesses or from mixed signs partaking of the nature of likeness and symbols. We think only in signs. These mental signs are of mixed nature; the symbol-parts of them are called concepts. If a man makes a new symbol, it is by thoughts involving concepts. So it is only out of symbols that a new symbol can grow. *Omne symbolum de symbolo*. A symbol, once in being, spreads among the peoples. In use and in experience, its meaning grows. (1894:10)

Just as *Thinking* is very unlike the categories of *Feeling* and *Reaction*, so too is Symbol very unlike Icon and Index for the particular generative character of Thirdness whereby laws or ideas become attached to or associated with their object (are generated; emerge); it is Thirdness "which operates to cause the Symbol to be interpreted as referring to that Object" (*Nomenclature and Divisions of Triadic Relations, as Far as They Are Determined*, 1903: 292). Symbols lack the character of *truth* found in Icons and Indices in that the Symbols are pure abstractions. "They neither exhibit the very characters signified as icons do, nor assure us of the reality of their objects, as indices do" (*New Elements*, 1904: 307). In Thirdness, we lose the connection we had to what we may call *truth* that a representation or sign holds in its Firstness or Secondness (as Icon or Index), as the Symbol does not *originate* in its Object, but in its interpretation (in the relation of Subject to Object). In its expression as Thirdness, a Symbol loses something of the claim to *truth* (or objectivity) which may be associated with an Icon or Index, however, in the process it gains "a great power of which the degenerate signs are quite destitute. They alone express laws" (*ibid*. 308).

All words are Symbols. All thoughts are Symbols. For a flower, the Sun is a Symbol. For a bee, the flower is a Symbol. The Sun does not resemble or indicate nutriment or photosynthesis to the flower, nor does the flower resemble or indicate honey to the bee. Further, Symbol cannot be divorced from purpose or *telos*, as it is inherently teleological. A Symbol, unlike an Icon or Index, has a purposed interpretant; the meaning of a Symbol is *intended*, and intended precisely for the very interpretant of the Symbol: "Its very meaning is intended" (*ibid*.). This is not teleological *necessity*, however, but historically emergent teleology – the very *intentionality* of life. A Symbol "*becomes such* by virtue of the fact that it is interpreted as such" (*ibid*: 317, *my emphasis* *added*), and does and can arise from "accidental circumstance or series of circumstances, which the history of any word illustrates" (*ibid*.). But a Symbol also only *becomes* such by virtue of fulfilling its function, by having just such a purpose, which is not merely the purpose of the Object of which it is a sign, but also the purposes of the Subject *with* whom it is so forged and *becomes* (sign carrier, signified object, and interpretant).

Meaning versus Mechanism

So it is clear that in a Peircian framework, a sign is more than *just* a sign, but where does mechanism fit into such a semeiotic? Are sign and mechanism mutually exclusive, or can one partake of the other? As discussed earlier (in Section 1), the mechanistic paradigm which grew out of the work of Hobbes and Newton, Hooke and Boyle, together with the spirit of Cartesianism found also enshrined within the scientific method, introduced a still dominant conception of nature as mechanistic. As discussed, with mind either as a complex mechanism itself, reductively explicable, or as something entirely distinct and separate from nature – intricate, perhaps, but reductively explicable nonetheless. Through the mechanistic paradigm and its influence, persistent metaphors emerged and *became*. Classical mechanics established the foundations for materialist reductionism, shaping the very questions we would come to ask about the cosmos, and defining the methodology of our investigations. It has been the prevailing instrumentalist and mechanistic philosophies of Moderate Enlightenment conceptions of humanity and nature which have come to shape our lives and institutions, and the metaphors we use to describe our relations to the world. The Darwinian model of natural selection further entrenched this position (metaphor), leading to Neo-Darwinian interpretations of molecular and genetic reductionism and to association with the mathematical theory of information, particularly biological information. As Hoffmeyer (1997) notes, however, alongside such dominant molecular and genetic materialist reductionism has been "an undercurrent to this trend... much less noticed" (p 355) which has been asking different questions; questions to which mechanistic reductionism can offer no response.

Mechanism, we may say for the sake of simplicity, is the transfer of energy. Correlatively, we may suppose that a sign is the transfer of information, rather than energy. In doing so, however, we will run into a number of obstacles due to the very division of perspectives which has characterised contemporary life sciences. To begin from a purely semeiotic perspective, a sign, according to the Peircian semeiotic, is not merely the transfer of information (whatever that is, as we will discuss shortly), but *exists* as a sign only in the *process* of irreducible triadic relation between all three components – sign carrier, object signified, and interpretant. The "transfer of information" is really only one portion of a sign, and if such a definition is to be used, it must be a great deal more specific, with contained reference to the subject, object, and form of relation (not to mention *type* of information transferred), and relevant translation (and purpose) of such information to both subject and object of transmission. A sign then, is not the transfer of information, but a *phenomenology of signification*.

The further problem, of course, is to understand what precisely is information? For a physicist, and within the mathematical theory of information, information is conceived as a property of its object; an objectively existing, measurable quantity. The mathematical theory of information, first developed by Claude Shannon (*Claude Elwood Shannon Collected Papers*, 1993, ed. N. J. A. Sloane, Aaron D. Wyner), expressing information as a quantifiable property, has been broadened from its initial conceptions for signal processing into an entire informational view of the cosmos, and has greatly influenced the direction of numerous fields, including biology. Due to the reductionist inclination inherited from the instrumentalist and mechanistic philosophies of Moderate Enlightenment conceptions of humanity and nature, and the metaphors developed through that inheritance, mainstream biology has largely adopted this idea of biological information *as* mathematical information, "an objectively existing property of so-called informational molecules such as DNA, RNA or protein" (Hoffmeyer 1997: 358). This position has been thoroughly criticised from a semiotic perspective (Yates and Kugler 1984; Rosen 1985; Kampis 1991; Hoffmeyer and Emmeche 1991; Sharov 1992; Hoffmeyer 1996, 1997), primarily on two grounds – the first being that even within such a mathematised conception of biological information, biochemistry is indivisible from communicational terms and ideas (Yates 1985), and the second being that biological information is equally inseparable from purpose (Hoffmeyer 1995) and from its context within a system.

Biosemiosis

Semiosis goes on at all times, at all scales of complexity, throughout the biosphere. Sign processes, or the *phenomenology of signification*, govern and regulate all living systems; "life was from the very beginning suspended in a universe of signification" (Hoffmeyer 1997: 375). The confronting aspect of this idea for many is that such a biosemiotic understanding of the cosmos implies a *subjectness* as emergent at some point of pre-minded, physical processes. Such a *phenomenology of signification* exists in the relationship of just such subjects with their environments, and in the activity which occurs at the interface between them. It is, of course, not a problem to talk about semiotic relationships at higher levels of biological complexity; we will face little resistance to the idea of such *subjecthood* being accepted at the level of what we might call "lesser" animals, and should have further little refusal for extending such *subjecthood* to insects and even organisms of lesser complexity. We may face some resistance, of course, with the idea of a vegetative level of semiosis and *subjecthood*, but evidence in the natural world profoundly supports this idea. In life, down to its most basic forms such as prokaryotic bacteria: we find in every organism the subjecthood embodied in the relationship of organism with environment, in the sensitivity to conditions and the valuation of some conditions over others. In the prokaryotic bacteria, we can see in its (possibly) simplest form, how the boundary (or membrane) which defines the organism, is a (bio)semiotically active object itself (and an object *to* the subject of which it is boundary).

This has been restated by biosemioticians as "signs, not molecules, are the basic units in the study of life" (Emmeche et. al. 2002:14; Hoffmeyer 1995:23, 1997: 940; Kull 1999), explicitly: "in order to have a set of physical processes be characterised as living, these have to be realized, partly or fully, through the mediation of signs" (Emmeche et. al. 2002:14). Such a statement, much like the one we began this chapter with, in stating that *everything* can be a sign, concerns not only methodology of epistemology, but ontology – the intentionality of life, the future-directedness of life's striving toward growth and multiplication – *is* the *same* process whereby a Symbol *becomes*. The emergence of life itself is a *history* of not merely molecular shapes and their interaction, but semiotic aspects of non-living material processes gradually increasing their autonomy, creating an ever more refined and sophisticated semiosphere which makes possible the recognition processes engaged in by such molecular shapes. Biosemiosis emerges from a pre-biological "universe of signification," whereby the sign precedes the chicken and the egg.

This position has drawn harsh criticism from mainstream biology as being inherently vitalist, or what Barbieri (2007) identifies as "a compromise position between vitalism and mechanism" (p7), particularly identifying Uexküll with neovitalism (*ibid*.). As Barbieri counters to such criticisms however, this is a misapprehension of what biosemiosis *is*; "the application of a semiotic paradigm to the study of nature has *nothing to do with vitalism or finalism*" (*ibid*. p 59, *my emphasis added*), but is instead the conviction that biology and science must be able to account for something more than efficient causality when it comes to accounting for life and mind, and their emergence from within Nature; where "causality, then, should be studied in the light of semiosis, not *vice versa*" (*ibid*.).

Alongside vitalism is the criticism of teleological anthropomorphism, particularly concerning the primitive intentionality of pre-minded Nature (or even "lesser" animals, from some perspectives). As Hoffmeyer (2010: 98-99) concedes, such anthropomorphism "clearly poses a challenge that must be confronted," but confronted in tandem with "the danger of anthropocentrism: *the reading of humanness out of nature*." The definition of *intentionality* we invoke here is that proposed by Franz Brentano (1874: 88-9), wherein intentionality is "the one positive attribute that holds for all mental phenomena" (*ibid*.), or the property of *aboutness*. This *intentionality* is also the basis for Husserl's Phenomenology, which differs greatly from the Peircian position we are putting forward, in that it views mind (at least the locus of such phenomenology) as naturalistically inexplicable. Beyond that point of contention, both the biosemiotic perspective and the phenomenology of Husserl agree that mind is indeed *real*, as well as *irreducibly intentional*. It is precisely this point of dispute, however, in which the insights of Peirce are the most illuminating, as it is the dichotomy of mental phenomenology evading naturalist explanation that Peirce so effectively dissolves, not by grounding *intentionality* in mind, but by recognising mind as naturally emergent from the *intentionality* of Nature's semiosis. Before life and mind, Nature has always been a semiosphere, and *subjectness* is not a binary value, but is "a more or less phenomenon" (Hoffmeyer 1997: 940; 1992: 103; Kull 2002: 18).

Subjectivity as embodiment

Evolution is irreducibly semiotic: even the concept of 'selection' implies triadic semiosis. Evolution is not merely the maximisation of 'complexity' or 'information content,' but *is* the evolution of semiotic *freedoms*- through ever more increasingly sophisticated semiotic interactions. Further, 'selection' is but one half of the evolutionary process; it is *natural play* which makes such *natural selection* possible (providing such objects of selection). *Natural play* is the biosemiosis which goes on at all times, at all scales of complexity, throughout the biosphere: it is the exploration of relationships *between* – between systems at every level of complexity – between every boundary or closed membrane through which an interface becomes a site of activity, of semiosis. All boundaries, through which the "double twist of inside and outside are made possible" (Kull 2002: 17), are *semiotically active*, becoming objects to the subjectivity created at just such an interface. This interface "lies at the root of the strange future-directedness or 'intentionality' of life, its 'striving' towards growth and multiplication" (Hoffmeyer 1998: 40), and is the site of Nature's play-like generation of autonomy through the exploration of relationships. *Natural selection*, here, is the entropic regulation of the autonomous generation of an ever more sophisticated semiosphere: it is *selection* which acts to fix behaviours (relationships, morphologies, genetics), both bringing an end to natural plays, while opening up further possibilities for the autonomous generation of novelty (*new plays*) at ever increasing degrees of complexity and sophistication (Bateson 1979: 139). Bateson contrasts this natural *play* with the natural *selection* which acts to settle such plays through the establishment of *ritual*: where the play establishes and explores relationships, ritual affirms such established relations (p 151). If *selection* decides which branches are to be pruned according to some ambiguous conception of fitness within a system, it is *play* which generates such new branches.

And a branch may be a good metaphoric vehicle through which to approach the concept of subjectivity and embodiment. The family tree, or tree of heredity, is already a metaphor with entailments and associations (a developed symbolic relationship with) the Darwinian and Neo-Darwinian conceptions of selection: we talk about branchings in historical heredity whereby more complex genetic forms evolve from less complex ancestors, but we also talk about the genetic legacies of such developments and heredity in the more complex organisms, particularly ourselves (e.g. our tail bone, and until quite recently, accepted reference to the Triune or reptilian brain or other paleomammalian traits). If we are to pick out humans and follow back the evolutionary heredity through species and genus – through mammals and reptiles according to the modern synthesis – we follow a history written backwards where any individual stage when isolated can be seen to contain the potentials from which further developments of complexity depend, but also the *history* of development to that isolated point – all of the 'current' dependencies at any stage are built upon previous developments, and contain within themselves a *version* of the levels below or preceding. Just as we explored in Chapter 5 in our discussion of *Umwelten*, the emergence of a relationship between subject and object (and hence one mediated through *Thirdness*) manifests not only at the level of boundary between organism and environment, but also at every nested compositional level within the biological construction of every such organism, at every boundary.

Let us consider then, the subjectness of a tree – or, more accurately following the metaphor we have employed – the subjectness of a branch of just such a tree. Notwithstanding the timely intervention of an arborist (or the peculiar abilities of some types of trees and other plants), if separated from the tree, the branch would surely die, while such a definitive claim could not be made for the tree from whence it came, which would likely live to grow new branches. The branch could of course also be grafted onto another tree. We would say, according to some of the conditions we have set out up until now, that as long as it is living (be that on the original tree, grafted to a new one, or even in some in between state), the branch must be afforded some sense of subjecthood. Further, not only does this branch contain further branches, but also buds. The condition of subjecthood must be further extended to each such branch, and each such bud – indeed even further. As we discussed in Chapter 5, there are untold numbers of individual *Umwelten* within every individual living organism, each corresponding to a degree of *selfhood*, and in this, there are grounds for considering the living body (metaphorically and analogically) as a "swarm of swarms."

Swarms of selves

Hoffmeyer (1997b) proposes a "fertile analogy" (Kull 2002: 19) between the principles governing swarm dynamics and the developmental hierarchies of nested *Umwelten* within complex living organisms (indeed, everything from the simplest multicellular organisms), urging us to consider these as a hierarchy of swarms (p 940). In swarms we find methods of distributed problem solving integrated through environmentally mediated communications, whereby individual agents communicate *through* the environment, by acting upon it, both as individual and as swarm. The *Umwelt* of an individual agent within a swarm is both inseparable from and irreducible to the swarm, and it is a case of scalar hierarchical nesting of wholes which in turn are parts within wholes. While an organism can be conceived on its own as a biosemiotic system with its own particular *Umwelt*, it is also composed of hierarchically nested biosemiotic systems functionally embedded within it (down beyond the cellular level, to the levels of organelles and the levels of DNA and RNA), where each biosemiotic system necessarily has its own *Umwelt*, which is inseparable from the *Umwelt* at the level of the individual organism. It's *selves* all the way down.

Hoffmeyer (1995) further extends this idea to a consideration of mind (and proprioception), contending that the embodiment of mind functions much the same as a swarm, and that "thoughts and feelings are not localised entities. They swarm out of our body collective" (1997b: 940). To understand this fully we can return to the idea of the membrane or surface, and the semiotically active character of all such 'surfaces': Life is a surface activity on a Möbius strip of sorts (Hoffmeyer 1998), whereby an asymmetry between outside and inside is continuously both reinforced and challenged; whereby *selfhoods* are created and constantly redefined according to such surfaces. In this, we find the same challenge posed by the implications of Biosemiosis of a form of *subjecthood* to the pre-minded environment itself – the biosphere, or semiosphere – whereby degrees of such *subjecthood* must be attributed all the way down *and* all the way out, and perhaps both challenges are best described by the same "fundamental asymmetry" (p4) produced at every surface where life happens.

Boundaries are problematic to discuss without reference to a subjectivity and are fractally perspectival — like standing between two mirrors.

> For a start let us observe that what is outside actually always tend to be inside something else, and what is outside at one instant of time may be turned inside at a later time. (*ibid*.)

If I were to begin from my own perspective, I could consider the surface of my skin to be the boundary between what is inside and outside. If I were to disrupt this boundary, perhaps to look inside with the aid of a scalpel, I would be struck by the multitude of boundaries and surfaces I would come across with even a small incision. The distinction between inside and outside can no longer be made at the surface of my skin, which clearly itself has two outside surfaces distinguishing what is inside and outside the skin (which, again, is composed of distinct layers), and what is inside my body is technically outside of my skin. The distinction between inside and outside is challenged by the very attempt to *look inside*; as we shrink our perceptions down to the size of blood cells, membranes, boundaries and surfaces separate living systems into distinct nested organizations of hierarchies of swarms, of *selfhoods*:

> The membranes of living systems – at whatever level, i.e. whether they encircle sub-cellular organelles, cells, tissues, organs, or organisms – are in fact best described as interfaces facilitating a highly regulated exchange of signs between interiors and exteriors. (*ibid*.)

It is in this twist – or rather, this shifting of our focus from *selfhood* as a derivative of self-aware mind to one of a nested concept of selfhood by degrees (in accordance with the degree of poverty or complexity of *Umwelt*), contextually perspectival – that mind is once again returned, quite explicably, to Nature, as an emergent quality of that semiosphere, which, after untold years of evolution has developed semiotic systems so refined that they only remotely depend on the semiosphere they emerge from, such as the language I think in (and indeed the mind I call mine to think in). The organism – human included – is likewise dovetailed into its environment, through both the *inside exterior*, the *Umwelt* of the organism, and also the *outside interior*, or 'semiotic niche' (Hoffmeyer 1996) that every organism must occupy within the biosphere.

Learning the ins-and-outs of ins and outs: Semiotic niches

Hoffmeyer (1996a) further proposes the *semiotic niche* as "the biosemiotic elaboration of the ecological niche" (p 140) as a different perspective on the concept of an organism's *Umwelt*, as it is "the character of the animal's *Umwelt* [that] defines the spectrum of positions that an animal can occupy in the biological sphere, its semiotic niche" (*ibid*.). In this, the semiotic niche is the necessary precursor to the ecological niche and requires the same potentials for evaluation and valuation discussed in Chapter 4 as necessary conditions for the possibility of freedom. Every organism is required to master a set of signs in order to survive (Hoffmeyer 1998: 9), signs which compose its *Umwelt*.

This is the world that every organism (indeed, every nested level within every organism) is birthed into – a world "perfused with signs," wherein certain signs "shine forth from the dark like beacons," creating the conditions for such *selfhood*.

> The answer is that self-ness presupposes temporality, a self must have an internal temporal link for otherwise it would be meaningless to say that the world matters to it. If something should matter to a system then the system must have an existence in time. (Hoffmeyer 1998: 10)

These signs which *shine forth*, which correspond to the organism's *Umwelt*, serve to simultaneously create and locate that selfhood, orienting and integrating the subsets of *Umwelt*-space and *Umwelt*-time; "the temporal surface is linked to the spatial surface, the two asymmetries are integrated: time is *situated* and loaded with *agency*" (*ibid*.). In some of the more simple organisms we have discussed, such as prokaryotic bacteria, the relationship of the sign to its object is a correspondingly simple response to stimulus, whereas even in "lesser" animals, we find necessary extended periods of tutelage required for mastering the signs required in order to survive, with the level of complexity of sign relations necessary to master corresponding (generally; there are exceptions) to the period of apprenticeship. At the complex end of this spectrum where we find ourselves, this involves an incredibly involved process of learning that never abates; at the other end of the spectrum we find the emergence of *habit-taking*. It is this primordial *habit-taking* that we will be considering in the next chapter, with the Schellingian conception of life itself motivated by an *a priori* drive or striving, conducted in thoroughgoing restriction; the cosmology of Peirce.

CHAPTER 9

An Alternative Cosmology: Peirce's Objective Idealism

"But what is first for us is not first in Nature."

- Charles Peirce, The Seven Systems of Metaphysics 1903: 194

Having introduced the scaffolding of the Peircian semeiotic, we are now in a position to properly introduce the cosmology of C. S. Peirce in all of its glory. We will be working through several ideas that Peirce himself progressed through in presenting his doctrine of objective idealism, in which all matter is but mind, hidebound with habits, and the developmental teleology which underlies everything in the cosmos: the *Cosmic Conatus*.

Peirce's guess at the riddle

Of C. S. Peirce's obsessions, Emerson's *The Sphinx* is perhaps the most prominent and recurring, and one particular line, "Of thine eye I am eyebeam," finds its way into his writing time and again. According to Thomas Whitaker (1995: 179), *The Sphinx* was also Emerson's favorite poem, and disputes concerning interpretation are rife to say the least, though from Emerson's own first mention of the Sphinx in his personal journal (*The Journals of Ralph Waldo Emerson*, ed. E. W. Emerson and W. E. Forbes, Boston 1909-1914, II, 121), it is clear that the poem's intended meaning encompasses questions of both the origin of man and agency and the possible relation of the noumenal to the phenomenal;

> The aenigma of ourselves swallows up, like the Sphinx, thousands of systems which pretend to the glory of having guessed its meaning.

The Sphinx in the poem, concludes with the promise that "Who telleth one of my meanings is master of all that I am," the poet within the poem – the "unanswered question" – obviously having failed in his guess at the riddle, as "each answer is a lie." The answer offered by the poet "Dull Sphinx, Jove keep thy five wits; thy sight is growing blear" causes the Sphinx to bite "her thick lip," responding:

> "Who taught thee me to name? I am the spirit, yoke-fellow; Of thine eye I am eyebeam."

The eyebeam, of course, encompasses a range of metaphorical entailments, with normative associations. The eyebeam, from a physics going back to Aristotle, also understood as the *gaze* of the eye[7]; the eye was conjectured to generate of beam that made sight possible. In this, sight extended out in a beam from the eyes, the same power attributed to the dread gaze of the Basilisk, where the glance or gaze is a force or a power of the eyes. There is a Möbius strip of implication to this idea however; it is at once the gaze as an attributed power of the eyes, and also a separation of that power from the eyes and shifted to the gaze itself. By this conception, the eyes take on the character of a tool, inactive or passive vessels requiring the power of the gaze to operate (be operated). From our contemporary perspective, we would agree that 'sight' does not occur in the eyes, as Kitcher writes, "visual images do not emerge simply from retinal data, but require a great deal of processing" (1996: xxxiv), we accept that sight is

[7] Also is the eyebeam (or I-beam) in an architectural capacity is that around which a structure such as a roof is constructed on which it and depends, analogically equivalent to the cornerstone in similar metaphors found throughout *The Bible*. In this sense, it is the eyebeam upon which the structure depends; as with the cornerstone, any imperfections in the eyebeam for its purpose (formal and efficient causes) will be amplified throughout the construction.

not so much a power of the eyes as a power of mind embodied. From this perspective, the eyes are indeed a faculty (if not tool) of the mind, without which no sight would be possible. In both conceptions, the power of sight is at first attributed to the eyes, before being removed from the eyes and conferred upon a union of which the eyes are but an aspect, or part of a whole.

The eyebeam is that upon which the eye depends for its construction and function, and a primary inference here is one of design, or hierarchies of inheritance. The eyebeam is that upon which the eye itself depends for its capacities. And though this may be interpreted as the Sphinx stating "it is through me that you are able to see," the position is further complicated by what follows in the Sphinx's dialogue; "Couldst see thy proper eye," which is awash with metaphorical entailments, from Descartes' notorious speculations concerning the pineal gland to more mystical associations, though we may also take this as the unity of the senses, as referring to embodied mind. It is, after all, only through the understanding that images upon the cave wall can come to be seen as mere projections; the mind itself has the clarity to see what the eyes can only take in. The Sphinx, however, does not make a distinction when she says "Of thine eye I am eyebeam," nor does she say so in the plural, so it may be taken that she is describing the Form of which the eye partakes, with the very thing the eye fails to be able to see being itself.

Further, the Sphinx addresses the poet as "yoke-fellow," implying a bound unity between the Sphinx and mankind. An oft used metaphor common throughout the *New Testament*, a yoke fits around the necks of two beasts (typically oxen) to share the burden of drawing a plow or pulling a cart. By design this forces the oxen to work in concert – if one pulls ahead or falls behind, discomfort is caused to both, and the design is such that the least burden is applied to both animals when the burden is shared equally between them. Perhaps it is this metaphoric yoke and the strain put upon the Sphinx by "the fate of the man-child" that causes her to bite her thick lip, as she knows the burden of her secret is hers alone until someone can tell even one of her meanings. And it is in this that she is bound to man, guided sentinel to sit and wait out the ages until such meaning is discerned, and perhaps with such understanding the yoke is dissolved.

In *What Is a Sign?* (1894: 10), Peirce clarifies for us what he takes the meaning to be in his description of a symbol, and how the meaning and understanding of a symbol grows in actual history with a self-generative quality: "The symbol may, with Emerson's Sphinx, say to man, Of thine eye I am eyebeam." To understand the full extent of Peirce's attempted architectonic is daunting. Personally, it was only through his phenomenological conceptions that I came to understand *Firstness*, but it is very clear that Peirce held an isomorphic understanding of his Universal Categories as being authentically universal from early in his writings. *A Guess at the Riddle* was written in many stages between 1887 and 1888, and while never properly finished, many of the ideas therein would inform a great deal of his later writings, particularly the *Monist* Metaphysical Series. It is clear from the very first words the challenge Peirce was setting out for himself with his *Guess* (p 10): "To erect a philosophical edifice that shall outlast the vicissitudes of time..." An earlier attempt at a phenomenological conception of the Categories can be found in Chapter IV: *The Triad in Psychology*, though somewhat more convoluted than the 1894 interpretation, most largely because Peirce is still using the Categories of mind as defined by Kant of *Feeling*, *Willing* (which Peirce redefines as *polar sense*, as in the dichotomy existing between pleasure and pain, 1887-8: 258-9), and *Knowing* to express the same ideas.

> Immediate feeling is the consciousness of the first; the polar sense is the consciousness of the second; and synthetical consciousness is the consciousness of a Third or medium. (1887-8: 260)

As with most of the ideas in *A Guess*, these concepts would be worked out in more thorough detail over the remainder of Peirce's life, and as students today we are afforded the luxury of his body of work, both in its unfolding as a process and as an entire body of reference. *A Guess* seeks to set out a complete architectonic according to his triad of universal categories in which he works through metaphysics, psychology, physiology, biological development, and eventually to physics, effectively reframing and reorganizing the branches of human knowledge according to his triadic conception. It is within the final section on physics that Peirce outlines his cosmology of becoming.

Taking Habits

> Three elements are active in the world, first, chance; second, law; and third, habit-taking. Such is our guess of the secret of the sphynx. (1887-8: 277).

For all of his grandiosity in some respects, C. S. Peirce was nothing if not a (defining) pragmatist. A consequence of this orientation is a number of other ideas deserving of consideration before we proceed further into Peirce's cosmology; namely, fallibilism, synechism and tychism. Peirce's pragmatism (or pragmaticism) is a process of reasoning and an attempt at an ethics of reasoning by relating meaning to consequences, in which ultimate truth is considered a genuine end, but with the *a priori* acceptance that universal truth is practically unattainable and that knowledge of anything proceeds by way of the same stumbling pedestrianism Peirce always considered himself to think in. As discussed in the previous chapter, the removal of epistemology from its direct object, and the awareness of such a remove, rather than a stumbling block for Peirce, provided him with his own cornerstone on which to construct an historically emergent epistemology that abjures universalizing claims and proceeds by way of trial and error:

> How long it will be before we light on the hypothesis which shall resist all tests we cannot tell; but we hope we shall do so at last (CP 7.115)

Fallibilism is an essential facet of Peirce's pragmaticism, while simultaneously a consequence of it, as an ethical convention for the use of signs. Quite simple in essence, it is the axiom that no matter what we believe, our knowledge ever remains possibly wrong and open to revision. It is ever possible that new information or a new interpretation on old information can radically change everything we believe, and it is only on this basis that we can have any assurance of our conclusions. Certainty, according to fallibilism, simply cannot exist for us, and embracing this precept is at the same time a necessary condition for the possibility of any knowledge whatsoever:

> As all knowledge comes from synthetic inference, we must equally infer that all human certainty consists merely in our knowing that the process by which our knowledge has been derived are such that have led to true conclusions. (CP 2.693)

It is only through such a process and with such an approach to the nature of epistemology that knowledge can become legitimate. The grounds upon which we can make a claim to knowledge cannot be littered with hypotheses we hold beyond proof of their illegitimacy, and we must be prepared, if we are in search of knowledge, to cast aside what we believe to be true as being in fact wrong with less hesitation than if we were to be learning a new fact or word or term for something already known. What is known, what can be called knowledge, is always an actual history, and proceeds by way of improvements upon its own deficits:

> The whole history of thought shows that our instinctive beliefs, in their original condition are so mixed up with error, that they can never be trusted till they have been corrected by experiment. (1887-8: 274)

The history of human knowledge is not simply permeated by examples such as Aristotle's claim of flies having four legs persisting as a scientific belief for hundreds of years – knowledge is essentially built upon such false claims and mistaken ideas. While it is spoken of as a thesis, doctrine, method, and even theory, fallibilism is the underlying basis of all scientific endeavor and the foundation of all scientific claim to knowledge. Science (and, indeed, knowledge) proceeds by way of mistakes and adjustments, hypotheses replacing other hypotheses based on the grounds of that which should better account for discovered deficiencies in the preceding paradigm will hold a position of authority until their own deficiencies are discovered and responded to with new hypotheses. The epistemological authority of science is grounded not in knowledge as a permanent commodity, but as a process; at any given time, what we *know* is entirely historically contingent, and the value of that knowledge lies not in its eternal truth, but in continual reflection, and to elevate our knowledge to the realm of eternal or ultimate truths is to cease scientific endeavor and return to ontical superstition and fideism.

And to understand knowledge in its processual diachronic character is to grasp an element of Peirce's theory of synechism – the presumption of continuity – particularly in its prodigious methodological consequence for science and philosophy. Synechism, Peirce defines for us, comes from the Greek for *continuous*, and connotes "the tendency to regard everything as continuous" (1893: 1), and is simultaneously a rejection of materialism, idealism and dualism, and even an attempt to "play a part in the one-ment of religion and science" (1893: 3). He begins his description of synechism with a rejection of the statement by Parmenides that "being is, and not-being is nothing," declaring instead that "being is a matter of more or less, so as to merge insensibly into nothing." Synechism is an evolutionary conception of everything in the cosmos partaking in that character of continuity, to the degree that it must reject any dualist philosophy "which performs its analyses with an axe," instead,

> The synechist will not admit that physical and psychical phenomena are entirely distinct, - whether as belonging to different categories of substance, or as entirely separate sides of one shield, - but will insist that all phenomena are of one character, though some are more mental and spontaneous, others more material and regular. Still, all alike present that mixture of freedom and constraint, which allows them to be, nay, makes them to be teleological or purposive. (1893: 2)

Synechism is at once a philosophy of continuity and change, a continuity of process, directionally adherent. For the synechist, all objects and phenomena – from ideas to substances – have "an imperfect and qualified existence" (*ibid.*) and the phenomena of their existence are determined by further phenomena and substrates of phenomena, as "that which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon" (*ibid.*). Any charges of infinite regress in this regard represent a serious misunderstanding of the emergence proposed by synechism – it is emergence of emergence *by degrees*. The continuity of synechism may be considered to extend, as a thread, uniting not simply *a thing* with itself in time, but as a web of connections between *every thing*; the individuality of things again by matters of degrees, with even the Cartesian selfhood that my ego maintains being simply "the vulgarest delusion of vanity" (*ibid*.).

This web of continuity is not merely categorical, as a like-ness of phenomenological being, but constitutional:

> ... the carnal consciousness is but a small part of the man. There is, in the second place, the social consciousness, by which a man's spirit is embodied in others, and which continues to live and breathe and have its being very much longer than superficial observers think. (1893: 3)

Indeed, that "your neighbours are, in a measure, yourself" (1893: 2), and that there are no immeasurable differences in phenomena – that is to say, phenomenological states are always matters of degree – whether by degrees between asleep and awake, or being and not being, and just as "when you sleep you are not so largely as asleep as you fancy that you be" (*ibid*.: 3), the "before and after" of *being* is not so different from being as to consider them irreconcilable, and

> when the carnal consciousness passes away in death, we shall at once perceive that we had all along a lively spiritual consciousness which we have been confusing with something different (*ibid*.).

Synechism is a semeiotic principle,

> founded on the notion that coalescence, the becoming continuous, the becoming governed by laws... are but phases of one and the same process of the growth of reasonableness (CP 5.4).

In *The Law of Mind* (1892), Peirce develops his doctrine of continuity – and as he states in *What Pragmatism Is* (1905: 335), any proof of pragmaticism "would essentially involve the proof of synechism," – proposing "the one law of mind" that ideas spread continuously, and in so doing stand in relation to other ideas, losing intensity as they affect others, but gaining generality in the process "and become welded with other ideas" (1892: 313). In its rejection of realism, idealism and dualism, synechism instead proposes the doctrines of logical realism, objective idealism, and tychism (333): "thorough-going evolutionism" and a rebuttal of all necessitarianism (1903: 194), tychism is the thesis that *chance* is not merely active in the cosmos, but *is* the developmental teleology on which the cosmos relies for its existence: *Chance* is ultimate Firstness.

In *Design and Chance* (1884: 219), Peirce states that "chance is the one essential agency upon which the whole process [of evolution] depends," and that "chance must act to move things in the long run from a state of homogeneity to a state of heterogeneity" (221). Chance, in this sense, can be understood as a tendency toward unlikely states, and functions very much as the contradistinction of entropy, "chance changes everything & chance will change that" (220), in that "Force is in the long run dissipative; chance is in the long run concentrative" (221), and that the outworking of one side of the antithesis informs the state of the other:

> The dissipation of energy by the regular laws of nature is by those very laws accompanied by circumstances more and more favorable to its reconcentration by chance. (*ibid.*)

Chance is the freedom which "issues in the strictest rule of law" (222), the indeterminacy that provides the premises for the very possibility of existence. This must not, however, be misunderstood as a dichotomy between the reasonableness Peirce felt the cosmos was coalescing toward and chance, but is again a trichotomy between chance – as a tendency toward the unlikely – in concert with law and habit taking (thoroughgoing restriction, constraint) which produce such reasonableness, and indeed, such reason.

> Three elements are active in the world, first, chance; second, law; and third, habit-taking.

In the beginning...

But as we are following Peirce, to begin with the beginning is problematic, namely as the beginning had not begun as yet, but these are precisely the sort of issues we should expect when we are attempting to talk about any Firstness. In our reliance on metaphorical orientations, we might be tempted to place this original Firstness somehow, finding relevant spatiotemporal distinctions problematic, we might find the best we can do is to say *before* there was even time to be before, there was an "original chaos" that really amounted to nothing; "mere indeterminacy, in which nothing existed or really happened" (1887-8: 278). The chaos Peirce refers to is not the chaos of dynamical systems mathematics, implying "a state of high order and lack of confusion"

(Dooley and Van de Ven 1999: 367-8), nor the chaos of common vernacular implying "a state of extreme confusion or disorder," but a chaos absent of everything except chance and indeterminacy, "completely undetermined and dimensionless potentiality" (CP 6.193). This was not a primordial nothingness *in* space, as space did not yet exist either; just pure nothing, or *no-thing-ness* (Houser 1992: xxxii): In the beginning was chance unconstrained, freedom and spontaneity, undetermined potentiality. The problems we encounter in our attempts to discuss this *something before anything* fall into the category identified by Castoriadis (1987: 201) as *Ontological Genesis*, describing processes which cannot be accounted for in terms of an already established order of things, such as we find in the Peircian cosmology we are presenting. We are perhaps best served, along with Žižek , to borrow the terminology of German Idealists – particularly Hegel and Schelling – and much later, Heidegger, and refer to this cosmic primordiality as *unprethinkable being*, for which, as Žižek (2009: 57) writes, "the modal-logical principle that actuality entails possibility does not yet hold," as unprethinkable being "precedes the establishment of possibility."

This original unprethinkable being came *before the first* Firstness, before time, before anything can be said to come before anything else, and from this undetermined potentiality, pure spontaneity transitioned nothingness (unprethinkable being) into Firstness, or *determined* potentiality; "This new state is a Platonic world, a world of pure firsts, a world of qualities that are mere eternal possibilities" (Houser 1992: xxxiii). Again, the word chaos is appropriate, though not in the contemporary uses mentioned above; the chaos of Firstness is the potentiality of the *actual* to happen, which through chance it just so happened to: "there would have come something by the principle of firstness, which we may call a flash" (1887-8: 278). It is quite clear at this point that our very language is failing us in our explanations. We cannot rightly call such unprethinkable being 'Zeroness' or 'Nothingness,' as a primordial essence of Firstness describes also this unprethinkable being, in the manner as we have said along with Peirce, "that which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon," and such an Absolute nothingness would not contain the character of Firstness required for its own, though we may perhaps borrow the idea from Lorenz Oken (as did Schelling) of the generative potential of zero, in which

> Numbers have not issued forth from zero as if they had previously resided therein, but the number zero has emerged out of itself... and then it was a finite zero, a number (Oken 1847: 7)

We can incorporate this idea with Peirce's statement concerning synechism that "being is a matter of more or less, so as to merge insensibly into nothing," so that the gulf between any two states must not be taken as irreconcilable, but as degrees, with even such a self generative potential as Oken's zero containing what we are compelled to call a degree of Firstness. The infinite zero which emerged out of itself may be aligned with what we have termed unprethinkable being, with the finite zero corresponding similarly with Firstness which emerged from itself, through from the infinite to the finite, a character of Firstness defines even unprethinkable being: there is no absolute zeroness.

And after the flash? Well, that is again problematic, as at the *time* we are describing, time as such still did not exist, and here it is not only our language, but our attachment to logic which presents us with a stumbling block, as no such reasonableness was *then* present in what we might (in our limited way) call existence *at that time*. Even the term "flash" implies such chronology in its definition as "to shine in a bright but *brief, sudden,* *or intermittent* way" (MacQuarie, *my emphasis*), as the very definition of the word defines it as occurring in a *time* not yet a feature of existence. It is, however, only through such words and conceptions as are available to us that we can consider the sublime, and *flash* is as appropriate a term as any in our limited vocabulary, and so we must also accept at least the idea of *after* in a time before time, if only due to logical coherency that cements us as belonging in such an age of reasonableness as we now do.

> Then by the principle of habit there would have been a second flash. Though time would not yet have been, this second flash was in some sense after the first, because resulting from it. There would have come other successions ever more and more closely connected, the habits and the tendency to take them ever strengthening themselves, until the events would have been bound together into something like a continuous flow. (1887-8: 278)

As Peirce goes on to detail, this flow created in this Secondness would not be time as it has *evolved* to be, but a "quasi-flow" essentially different in "that it would not necessarily be in a single stream," and relations of contemporaneity and succession would be challenged by simultaneity between states or streams "completely separated would be so many different worlds which would know nothing of one another." Habit would inform the *actions* of states, further separating that which is separate, and bringing together that (we cannot yet properly say *those*) which frequently coalesce, habit informing habit into tendency. The Secondness of relation of chronology is only one half of the Secondness created, as in addition to succession and contemporaneity, pairs of flashes would reciprocally Second each other, creating "the first germ of spatial extension," though again differing from our conception of space in that it would not have the regularity it has developed, "having one number of dimensions in one place and another number in another place, and being different for one moving state from what it is for another" (279). From this proceeds an almost *pedestrianism* developmental evolution in which states and relations interact through chance and habit, producing sequences and pairs of states producing habits differing from other pairs of states until "some of these states will chance to take habits of persistency," while other states would "fall out of existence." From those states which chanced upon habits of persistence, relations would continue to inform habits until such permanence became cemented in laws of Nature and substances, and through further carrying of such habits with them through existence, developed a gradual tendency toward uniformity. The world of Secondness – events and interactions – transitioned into the world of Thirdness through the persistence of habit toward permanence.

Objective Idealism

To appreciate the cosmology sketched by Peirce, we must do so in light of his synechism, tychism and fallibilism as outlined above. Firstly, through the light of his thoroughgoing synechism, Peirce felt the universe to be moving directionally through time, from an original state of pure freedom and chance toward a law governed, crystallised reasonableness. His speculations concerning the future of such a process differ in places; at times suggesting that such a shift from chance to reasonableness occurs by degrees until a state of equilibrium is attained (the state he felt was the current state of the universe), and at other times suggesting that the process will continue by degrees until a completely reasonable and law governed reality is reached, either completely devoid of spontaneity and chance, or ever persisting with an element of chance, however minute by comparison to reasonableness. It seems unlikely, however, that he was committed to any thesis which would involve the annihilation of the tychism he felt to underlie all processes in the cosmos, even by degrees, "so as to merge insensibly into nothing," though such speculations are beyond this inquiry at any rate. It is enough for our investigations to consider Peirce's cosmology in an *up to now* sense without any need for speculating on the Ultimate End of the cosmos. It has been our effort from the outset to seek a path past dualist ontologies, particularly concerning an understanding of mind and agency, and it is through the unpacking of Peirce's cosmology that we can investigate his claim that "the one intelligible theory of the universe is that of objective idealism, that matter is effete mind" (1891: 293).

As mentioned, Peirce's objective idealism emerged largely as a consequence of his synechism and pragmaticism. In *Man's Glassy Essence* (1892 c: 348), Peirce clarifies and expands on his objective idealism, using the 19th Century molecular theory of protoplasm and its properties as his proofs for the claims of objective idealism over other dualist conceptions, concluding that "physical events are but degraded or undeveloped forms of psychical events," cementing mind within Nature with the further contention that "mechanical laws are nothing but acquired habits, like all the regularities of mind" (349). Again, Peirce's cosmology *"consists in* tychism, anancism and agapism" (CP 6.303) and the metaphysics appropriate to it are synechism, logical realism, and fallibilism, making his cosmology is inseparable from the universality of his trichotomy, and, as he seeks to illustrate, the categories apply unequivocally and homologously, with the Firstnesses of *chance* and *feeling* providing two sides to the same coin;

> Wherever chance-spontaneity is found, there, in the same proportion, feeling exists. In fact, chance is but the outward aspect of that which within itself is feeling. (348)

He then further expands on his cosmology of *A Guess*, discussing the pre-Firstness we outlined above, stating, along with Oken, that "it was not a blank zero," but that the "mere nothing, from a physical aspect" was simultaneously "an intensity of consciousness" beyond the comprehension of what we understand as mind or feeling. So we might say, in the style of Saint John the Apostle, that In the beginning was chance, and chance was with mind, and chance was mind. This use of the term "mind" is perhaps misleading, as any definition of mind we might have settled on throughout the discussion up until now would be entirely insufficient to describe the "intensity of consciousness," and it is not *mind* in any way in opposition to matter, as "all mind *more or less* partakes of the nature of matter" (349, my emphasis added), and "if habit be a property of mind, it must be equally so of matter, as a kind of mind" (350). Nor is this mind as mind has evolved to be, certainly not in any way distinguished into any selfhood we may associate as a requirement for mind or mindedness.

Personhood is equally problematised; Peirce long held the notion, according to his semeiotic, that "a person is nothing but a symbol involving a general idea," but in *Man's Glassy Essence*, he admits that his "views were, then, too nominalistic to enable me to see that every general idea has the unified living feeling of a person." Taken alongside his One Law of Mind, in which ideas spread continuously, and in doing so stand in relation to other ideas, losing intensity as they affect others, but gaining generality in the process, becoming "welded with other ideas," and obviously through the lens of thoroughgoing synechism, in which the gulf between any two states must not be taken as irreconcilable, but as degrees, a conception of selfhood is presented that is very similar to that described in preceding chapters (particularly Chapters 4 and 7), in which selfhood and *subjectness* is not a binary value, but is "a more or less phenomenon."

Developmental teleology

While Peirce's cosmology has its supporters, predominantly in the fields of complex systems research and biosemiotics, it also certainly has its detractors, particularly of those who approach Peirce through his pragmatism, such as W. B. Gallie (1952: 215), who regarded Peirce's efforts to describe the cosmos as the "white elephant" of his philosophy. Perhaps such a criticism is more apt than it first appears: Peirce's cosmology is indeed the white elephant of his larger philosophical efforts, particularly for contemporary mainstream philosophy, for which the ramifications of its conclusions present a number of staggering problems. It is widely accepted that Peirce did not get the recognition he deserved for his insights in his life, and it is efforts such as this very thesis which propose his architectonic has still not received due attention and recognition. It must be understood that Peirce approached philosophy with the same intentions as the Ancient Greeks, believing that the purpose of philosophy was indeed to explain the mysteries of the universe, and his attempts to do so result not from idle speculations, but as a direct result of the more *acceptable* doctrines in his philosophical arsenal.

There is also a small irony, in that his cosmology was indeed a direct product of his pragmaticism, and the rejection of his cosmology, particularly of his objective idealism, represents a sincere failure to appreciate the very basis and first principle of his pragmaticism, namely fallibilism. Peirce's cosmology is a white elephant specifically because it cannot be so easily discarded or ignored as some appear to intend: it is troublesome, and particularly difficult to dispose of. And though it has never been a general custom of philosophers to "throw the baby out with the bathwater," and instead to salvage what may be of use surgically apart from those ideas which may weigh down or frustrate our conceptions, as indeed most developed philosophies might be shown to be a cobbling together of many ideas that had been suggested before, but when it comes to separating individual doctrines from Peirce's entire systematic philosophy, a scalpel might as well be an axe for all that must be pruned away for only logic, pragmatism and a theory of signs to remain – and further, in that prudent insights of even these fields must be ignored entirely – insights which have led to his cosmology and objective idealism. Objective idealism, particularly, is a white elephant specifically because it is so difficult to maintain as just another conception alongside the dualist paradigms philosophy and science have become so accustomed to (and comfortable with). It is the persistence of just such dualist ontologies that have justified the path of human action on this planet, particularly as concerns humankind's dominance and subjugation of Nature and our environment.

The monism of objective idealism, which holds that "physical events are but degraded or undeveloped forms of psychical events," presents an entirely different conception of the cosmos and our place within it, particularly when the insights of synechism are properly recognised. Humankind's progressive dominance over and subjugation of Nature has required the persistence of various dualist ontologies to support the rationality of its own project – namely, a fundamental division is required for such a relationship of dominance to even be considered rational. Where no such division presents, or can be hypostatised, any such relationship of dominance is absurd: we do not think in terms of subjugating our limbs to the larger trunk of our body precisely because we have an understanding of our own embodiment as a unity. It is only where a boundary presents or is imagined that an idea of division even becomes possible, as an interface which becomes a site of semiotic activity. It is how these relationships are considered that differs so greatly between various dualisms which justify by their inferred division a fundamental *right* of mind *over* matter (and even *lesser* mind, and nature), and a monism that maintains such a division to be simply an illusion of ego: a monism that maintains the nested compositional untold myriads of spatial and temporal planes within every individual living organism, and in which the organism exists, "which interpenetrate and complement, but in part also contradict one another" we detailed in Chapter 5, as simply an inward extension of the same outward synechism which connects, by degrees, everything. By this conception, minded humankind, for all of its glory and brilliance, exists along a scale of *selfhood* not at the top of any pyramid, but as a version of selfhood somewhere in the middle of an applicable scale (indeed, any appropriate scale investigating our place within Nature would be based on us in the middle, working outward).

And as to the special snowflake syndrome we hold for our own minded selfhood, "... it may be said that, judging by appearances, the amount of arbitrariness in the phenomena of human mind is neither altogether trifling nor very prominent" (1892 b: 330). As we are prepared to consider ourselves individually as one among many persons, so too must we consider our selfhood in the cosmos as one among many degrees of selfhood. Selfhood is generally where we define the limits to conceptions of ownership, such as our eventual rejection of the idea of human slavery in most human cultures, and the recognition of selfhood is a mutualism which admits it does not wish itself to be owned. Where various dualist ideologies have traditionally provided the grounds on which to rationalise such relationships of ownership, objective idealism demands a different approach to relationships at indeed *every* boundary, every site of activity – recognition is required. Such recognition fundamentally dissolves the grounds of legitimation for any concept of ownership whatsoever, instead implying a relationship of mutualism within the cosmos as a whole, our concept of *we* is broadened beyond other *people* to other *degrees of personhoods*, and *we are all in this together*.

Conclusion

This chapter has attempted to present a detailed overview of Peircian cosmology, of objective idealism and its claims that matter is a particular specialization of mind, hidebound with habits. We have made several important assertions throughout this chapter that deserve reiteration, particularly pertaining to processual epistemology, that such synthetic knowledge has been reached by processes that will lead, eventually, to true conclusions. As we have said, what is known , or can be called knowledge, always proceeds by way of actual history, through improvements upon its own deficiencies, with the epistemological authority of science (and philosophy) grounded not in knowledge as a permanent commodity, but as historically contingent process: not eternal truth, but continual reflection. It has been our effort from the outset of this dialogue to seek a path past dominant dualist ontologies, particularly concerning mind and agency, as it is the persistence and dominance of just such dualist ontologies that have motivated the course of human action on this planet, particularly concerning our relationship to Nature and our semiotic and biological environments, and our exacerbated condition of semiotic dissonance within those spheres. While not a counter to emergentism, objective idealism entirely rejects the materialist and dualist derived conceptions – particularly of mind – which have so immeasurably influenced modern thought and the contemporary human condition (physically, biologically, semiotically and ontologically) as entirely inadequate for a conception of humanity as an emergent phenomenon within Nature. This is not to say that objective idealism is offering a different history than that offered by the physical sciences, but a more thorough accounting of that same history, through which we can see evidence not simply of habit taking and mere motions of matter obeying laws of mechanical dynamics, but within this same process the active hand of chance, tychism. Mind within objective idealism, is not a substance or quality inherent in physical phenomena or processes, and such physical processes and phenomena, we contend along with Peirce, have no existence except as a specialization of mind: mind is not a substance; substance is a specialization of mind. In the next chapter we will be defending objective idealism from a great many objections that have and will arise against the Peircian architectonic we have outlined in the preceding exegesis in effort to better describe the position we are putting forward.

CHAPTER 10

Defending Objective Idealism

"Tut, tut, child!" said the Duchess. "Everything's got a moral, if only you can find it."

- Lewis Carroll, Alice's Adventures in Wonderland

In the preceding chapters of this final section we have presented first the architecture of Peircian cosmology through Peircian semeiotic and the universality of the categories of Firstness, Secondness and Thirdness, and then the outworking of the architectonic which was built upon those categories in objective idealism and the associated doctrines of fallibilism, tychism and synechism. In this chapter we will be responding to a great number of objections that have and/or would arise in response to the thesis we have presented.

Emergent problems[8]

Critics of Peirce's objective idealism are not limited to those who approach him through pragmatism, and there are those who consider themselves biosemioticians who would prefer we restricted ourselves to the insights we can gain from his pragmatism, logic and theory of signs. For some, objective idealism stands in some relation of diametric opposition to the very concept of emergence by degrees of complexity as we have been

[8] I would wish to attribute no less than infinite thanks to Dr. Michael Dix for his contributions to this entire section. The majority of my counterarguments have been framed in direct response to "devil's advocate" objections to objective idealism offered by Dr. Dix, and I recognise in this instance that appropriate attribution of ideas would be all but impossible for how he has shaped this discussion, and therefore offer my humble appreciation and acknowledgement.

outlining throughout this discussion, leading to another perceived dichotomy between the two ideas, as through mutual exclusion. For an emergentist, our human mindedness loses something special about it when viewed through the light of synechism: rather than emerging at whatever level of complexity that we choose to attribute mindedness or selfhood, we are compelled to accept that that the phenomena of their existence are determined by further phenomena and substrates of phenomena, as "that which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon," diluting, if you will, the extraordinary eminence we attribute to mind.

If we address first the proposed existence of a dichotomy between objective idealism and emergentism by degrees, then the further concerns which may arise from this might not be so problematic as they may initially appear. In truth, no such dichotomy exists, as indeed these two positions are describing the same fundamental processes, simply in less detail in the case of the emergentist. As we have noted, we should expect to run into problems when trying to interpret any of Peirce's ideas in isolation, and it is certainly no different with objective idealism: as a doctrine, it is simply inseparable from the whole of his systematic philosophy, and any perceived dichotomy between objective idealism and emergentism simply deliquesces in the light of synechism. Peirce is proposing not a counter to emergentism, but a more radical and thorough emergentism which accounts for such processes according to all of Aristotle's four causes, and indeed proposes mind as emergent semiotic causation, but attributes such emergent semiotic causation directly to the cosmos itself, as an outworking of the same process which has been the self generative potential of the cosmos itself from its emergence out of its own potentiality, according to the cosmology we detailed in the preceding chapter.

This, needless to say, is quite a radical position that is not without its adversaries. The greatest of these charges that may be leveled at objective idealism may be divided into two larger recriminations that fall under the broad categories of panpsychism and pansemiosis: panpsychism being a commitment to the idea that everything material, however small, has an element of individual consciousness; and pansemiosis, the equivalent commitment to the existence of signs and sign processes in the universe. These categories, though thoroughly insufficient for an understanding of Peircian cosmology, do, in measure, accurately describe aspects of his objective idealism, synechism and tychism, and it is therefore our assiduous responsibility to address all arguments put broadly against these two categories of ideas from within a Peircian framework.

Before proceeding with our arguments, it is worth a moment to return to several important ideas we covered earlier in our discussion which suggest for us the boundaries of acceptable resolution to our dilemma. Firstly, as we have contended, it has been the prevailing mechanistic and instrumentalist metaphors, derived as they were from the emergent zeitgeist of methodological scepticism enshrined in Moderate Enlightenment goals and ideas which have most extensively influenced conceptions of human mind and agency. These dominant conceptions lead to definitions of human mind as either being part of a mechanistically determined natural order, or to be otherwise non-natural if there is to be a possibility of free will. We have found further that it only within the acceptance of (however moderate) ontological dualism that instrumentalist and mechanistic conceptions can accept the possibility of non-mechanistic free will and human agency.

Through the perspectives of emergentism and Aristotelian causation, we have been able to identify deficiencies in the dominant mechanistic and dualist perspectives, deficiencies which those perspectives are incapable of identifying or responding to, particularly concerning the realm of human agency, freedom and free will. It is the very real possibility of human freedom and agency that both reflects the incoherency of the mechanistic and dualist derived conceptions and metaphors, and provides us with the very grounds to present the Peircian architectonic. The Kantian and other attempted resolutions to this dilemma, as we have found, fall short of an acceptable resolution to the issue of free will within an otherwise mechanistically determined cosmos. The alternative cosmology of Peirce that we are presenting *does* offer a refreshing perspective on an otherwise very old and worn dialogue.

Occam's Razor

In considering the arguments against panpsychic and pansemiotic aspects of objective idealism, which are in many ways systematically related, it may be worth beginning with the arguments that apply equally to both, particularly with Occam's Razor. Occam's principle forbids the addition of superfluous complications to explanations that are already adequate. Only where there is something more to be explained – something that the physical sciences cannot (and could never) fully explain – should we postulate an explanation in terms of mind and/or consciousness. As it happens, with regard to the cosmos, there is nothing of this sort requiring additional principles of explanation until the emergence of life and proto-life. Moreover, it is suggested that to invoke mental causation where (simple) physical causation is already adequate to explain a phenomenon would be at best superfluous, and at worst incoherent (if a violation of physical principles).

According to this argument, it is only with the emergence of life and proto-life that a purely materialist conception of the cosmos is challenged, and that the true mystery for emergentism is precisely *where* in the process of increasing complexity that what we might call life begins; that is, at what point we can attribute selfhood, or mind, or even semiosis. For the emergentist, it is only at this point – wherever it may be – that a biosemiotician even needs to depart from completely materialist explanations for causality, and indeed, in this, semiosis is merely bundled into the same category as mind in an essentially (either substance or property) dualist conception of the cosmos, where mind emerged from matter and brought with it systems of meaning and representation (or conversely that semiosis emerged from material processes and developed, as it were, into, or with, mind). It should be no surprise, in light of the prevailing instrumentalist and mechanistic philosophies of the Moderate Enlightenment conceptions of humanity and nature as we have outlined, that both science and philosophy are comfortable to overlook the quintessential failing of such materialist and dualist conceptions to adhere to Occam's principle on two distinct levels: firstly that such conceptions are simply *not adequate* to fully explain causality beyond the limited scope of formal and efficient causes, and secondly by the measure of Occam's own ontological simplicity, or explanatory parsimony, which measures the number of kinds of entities proposed by a theory.

Though dualist conceptions, in whatever form they present, provide a sort of safe haven for philosophy in its largest possible project: the great metaphysical explanation of ourselves, they do so at the greatest cost, for they only ever offer for us the phantom of an answer, which, if we are to be honest, has always been enough to keep the human philosophical effort going. Dualism, ultimately, is to philosophy what The Joker is to Batman: the continued presence of the latter is really only justified by the presence and persistence of the former, it is philosophy's great and protracted battles with dualism that define it as the dark knight of wisdom (where epistemology is the metaphorical equivalent of justice brought about). Philosophy is comfortable with dualisms – it is a familiar and longsuffering idea within philosophy, the fundamental divide between mind and matter, particularly – so much so that it can tend to overlook otherwise glaring deficiencies in the hypotheses they present. Occam's principle forbids adding complications to explanations that are already adequate. The first problem for emergentism and other dualist ontologies is that in order to deem adequate the materialist/physicalist explanation of pre-biological causality, all explanations must be *a priori* limited in scope to only formal and efficient causes. Any idea of material cause is referred back to the comfort of dualist conceptions, and final cause is bundled alongside semiosis, selfhood and mind in the *something other that came after* basket of inexplicable mysteries. Such materialist and dualist explanations can really only be deemed *adequate* when viewed through a lens already dirtied with the acceptance of paradox inherent in the attachment to such dualism itself. As this thesis has contended from the outset, the materialist and dualist derived conceptions – particularly of mind – which have so greatly influenced modern thought and the contemporary human condition (both physical and ontological) are entirely inadequate for a conception of humanity and our place within nature, and a constitutional cause for this is precisely our acquiescence to overlook material and final causes when accepting causal metaphysical explanations.

The immediate retort to such a position is to return to the familiar comfort of such dualisms, and to insist that, alongside the emergence of life or mind and semiosis (in whatever order), only then did final cause emerge homologously. No one is, after all, denying that such final cause is at the very root of the becoming of all life, Nature's own striving and intentionality, but only that such emerged from the 'meaningless' proto-Secondness of a purely material existence. Poof. Final cause did not exist in the cosmos until mind was around to think itself up, at which point it did, planning, as it were, for its own emergence as a plant does with the seed it grew from. The lack of *adequacy* of such a materialist explanation should be rather glaring, if not for the reassuring amenity of such dualist ontologies that similarly dispose of material cause in light of such problematic notions as mind and meaning, where such ideas must be approached as substances or qualities of an inherently materialist realism.

The second measure by which such materialist explanations fail the test of Occam's Razor is by the measure of Occam's own ontological simplicity, or explanatory parsimony, which measures the number of kinds of entities proposed by a theory: emergentism, in all of its forms, requires dualism; objective idealism is a monism which accounts for the cosmos with a theory proposing a single unifying cause. Occam's explanatory parsimony properly refers to two separate and related concepts; syntactic simplicity or elegance, and also ontological simplicity, measuring the entities or assumptions within a given theory. In the case of objective idealism, if we are to distance ourselves from the comfort of familiar dichotomies, it is clear that the picture of reality it presents better adheres to both conceptions of explanatory parsimony: the monist cosmology of objective idealism, synechism and tychism provides a more syntactically and poetically elegant conception than materialist and dualist alternatives, and does so through less fundamental assumptions and with fewer proposed essences. Ultimately, the value of Occam's Razor lies in the acceptance of aesthetic simplicity as a virtue: in theory as much as art. As Thomas Aquinas (1945: 129) put it,

> If a thing can be done adequately by means of one, it is superfluous to do it by means of several; for we observe that nature does not employ two instruments where one suffices.

This aesthetic value of simplicity or elegance, as emphasised by Aquinas, is an interpretation of nature's own aesthetic, an acceptance that any appropriate theory of metaphysics (and Occam's Razor is particularly contextual to metaphysical theory) would reflect that elegance that we are confronted by in every aspect of Nature. In this sense, objective idealism certainly fulfils the criteria of simplistic and aesthetic elegance preferentially over dualist or materialist cosmologies. In strictly this sense, the purely materialist mechanistic paradigm fulfils such criteria far more appropriately than dualist and emergentist conceptions, which by their very proposition are clumsy, certainly seeking to do by means of several what can be adequately done by means of one. In the case of realist mechanical reductionism, the picture painted indeed reflects the elegance of human produced art, but it falls short of the elegance offered by Nature itself. And, according only to the criteria of explanatory parsimony, we may prioritise either version of monism over dualist or emergentist conceptions (again, strictly according to these criteria), on the grounds of ontological simplicity regarding the number of postulated causes.

Further, if we are to continue with the principle of parsimony to prioritise between materialist and objective idealist conceptions, according to the emphasis of Aquinas of observation of nature itself, we would be unquestionably compelled to choose the aesthetic elegance of objective idealism over materialism due to one resounding feature of Nature unaccounted for in the materialist and mechanistic paradigms: the infinite recursion of fractals. As discussed in Chapter 7, fractal replication is one of Nature's hallmarks, to the degree that you can't really look at anything in N/nature terribly closely without finding scale invariant fractal repetitions of patterns (particularly the Fibonacci sequence). The fundamental conception of the universe put forward by reductionist physicalism stands in violation to this hallmark of nature, in insisting that we can eventually get down to the fundamental particles, parts or components which compose life, the universe and everything. Whether these parts which compose everything are of a single kind of matter, or multiple kinds, are discrete or unchanging, having properties, or lacking them; you can get down to the parts —whatever they may be — eventually. And such sciences are captivated by the idea of finding such parts and catching them under a lens. Nature (capital N), displays no such parts, only ratios and degrees, as does the monism of objective idealism. By all accounts, Peircian cosmology just offers a simpler, more elegant conception of the cosmos, particularly according to Occam's Razor.

Against pansemiosis: limits of signs

The first, and most damning, argument against the pansemiosis of objective idealism is that signs require interpretants, and thus, where and when no interpretant exists or could exist, there is no signification and no sign. For example, at the very earliest microseconds of the cosmos, there were no signs; likewise at the heart of a blackhole there (presumably) are no signs. Moreover, while one might argue that everything has the potential to be a sign, this does not entail that everything with this potential actually *is* a sign.

That signs require interpretants is undeniable: a sign *exists* as a sign only in the *process* of irreducible triadic relation between all three components – sign carrier, object signified, and interpretant, and as discussed in Chapter 8, rather than a *thing*, is more properly considered a *phenomenology of signification*. In a cosmos "perfused with signs," anything *can* indeed be a sign, though to be so it must fulfil four qualifications to in fact *be* a sign, and for any *thing* to exist, it must do so *as* a sign. Of these four preconditions, the first is some character or grounds of form or intelligibility, its Firstness; secondly is that such a thing stands in some manner in relation to something other than itself, its Secondness; thirdly that "everything must be comprehended or more strictly translated by something" (1867: W1 333); and fourthly that it exist in an irreducibly triadic relation between the object, interpretant and sign itself. A sign is not an inert *thing*:

> The whole purpose of a sign is that it should be interpreted in another sign and its whole purpose lies in the *special character* which it imparts to its interpretant. When a sign determines an interpretant of itself in another sign, it produces an effect external to itself. (CP 8.191, *my emphasis added*)

We will be returning to this *special character* of a sign and its purpose in response to the next counterargument, though for now it is enough to concede fully that signs require interpretants, and exist fundamentally in relations, as a phenomenology of signification. The further proposal from this is that where no interpretant exists, or could exist, there could be no signification and no sign. The examples given are within the very first microseconds of the cosmos, and in the heart of a blackhole, under which conditions there would be presumably, no interpretants, no signification, and no semiosis. Considering firstly the very first microseconds of the cosmos, as detailed earlier in this chapter, there was indeed *a time* before anything we could call a relation of signification according to the cosmology detailed by Peirce, in fact several 'stages' where only the word chaos is appropriate, and only then in very stretched forms of definition, very different from any form of common contemporary use. Spacetime itself emerged from relations of Seconds only, and it is only in the transition of reality into Thirdness that signs became possible. It must therefore also be conceded that, just as we must say there was a time before time, so too must we say there was a time before signs were possible, such was the sublime nature of the cosmos' own becoming. Subsequently is the proposal of the effect of the event horizon of a blackhole on the existence or possibility of signs.

To my understanding, up until the event horizon, a blackhole would influence Spacetime identically to any other massive gravitational object (such as a supergiant star), following Newton's laws of universal gravitation, and would be inconsequential to the existence and generation of signs. At the event horizon, of course, what we might call reality loses something of its familiar character of predictability, as gravitational forces too strong for even light to escape alter what we understand of the laws of physics. It would be therefore quite safe to assume that beyond that event horizon there could be no semiosis: certainly no interpretant would be possible, and even if such an interpretant were imagined, there is no reason to conjecture that any *thing* within a blackhole would even have any character or grounds of intelligibility, let alone a second *thing* to stand in relation to outside of imagination. Particularly any form of life, which requires far from equilibrium conditions, could not persist terribly long when compacted to a singularity, though such speculations can likely be extended to any degree of selfhood as an infinite curvature ends Spacetime as we understand it. It is therefore conceded that there are likely places within the cosmos where semiosis likely does not happen, or is not possible, such as in the singularity of a blackhole, though this in no manner diminishes any aspect of semiosis, but merely expresses theoretical limits of the possibility of signs and semiosis. It would seem most likely, that alongside everything we know of physics, semiosis too breaks down, or is perhaps crushed down within such a singularity, such is what we know of this feature of the cosmos, and the very nomenclature of singularity would suggest the very impossibility of any form of relations between, as no between could exist in a singularity. Further, there is another aspect surrounding the concept of blackholes to consider, particularly in the light of Peirce's tychism, whereby

> The dissipation of energy by the regular laws of nature is by those very laws accompanied by circumstances more and more favorable to its reconcentration by chance. (1884: 221)

Much as they are mathematically predicted by general relativity, so too are blackholes anticipated in Peircian cosmology in this character of tychism to create circumstances more and more favorable to reconcentration by chance. Beyond the event horizon, we can only speculate, but even the super massive two sided ejecta created in the collapse of a binary neutron star system into a blackhole seeds the creation of entirely new galaxies in just such a manner as suggested by Peirce. Again, however, what happens in a blackhole stays in the blackhole, so any speculations about it are purely conjecture, and regardless, are somewhat tangential to the primary argument, beyond conceding, of course, that there are clearly theoretical limits to the possibility of signs and the generation of semiosis, and that there are circumstances of the physical cosmos and its history in which finely nuanced modes of semiotic causation have been or would have been impossible, and indeed places and conditions within the cosmos as it exists for us today where semiotic causation would equally be impossible, or its possibility would potentially cease.

Against pansemiosis: Life and signs

The next argument against the pansemiosis of objective idealism follows on systematically from the first, in maintaining that where no interpretant exists that there is no signification, and no sign, and that a quite distinctive form of causation is required for something to be a sign for/to an interpretant, with an associated causal signature, arguing that it is thus most plausible that semiosis begins only with the emergence of living or proto-living systems and processes. In response, we must begin by restating the position of objective idealism that "physical events are but degraded or undeveloped forms of psychical events," and that the life and proto-life systems and processes which display particularly biosemiotic causal signatures are cultivated and prosperous advancements of this same process; a matter of vast differences in scale and perspective. Along such a comprehensive scale there exist countless stages of advancement and augmentation, each of which may suggest a fundamental or immutable division – such as the emergence of life, or proto-life, or a physical brain, or self awareness and personality – but that all such divisions, while real in an emergent historical sense, are not essential or fundamental divisions, but differing stages and degrees of development of the same process. This is particularly to say that any such ideas we have of mind, or consciousness, or subjecthood, and the functions and characteristics associated with those levels of developed consciousness are ***not*** coextensive throughout lesser developed versions of the same process, and just as the richness or poverty of an organism's *Umwelt* is determined at the organisms own level of complexity and development, so too is the degree to which we can attribute certain aspects of mind, such as consciousness, intelligence, or self awareness restricted to appropriate stages, levels or degrees of emergence, and such attribution should follow observable evidence of just such causal signatures.

There is, according to objective idealism, a point where the psychical aspects of events have degraded to the degree of being *purely* material; that is, still of the same essential and fundamental *substance* as mind, but in a different form or phase, "hidebound, with habits," "specialised and partially deadened" (1892 b:313). The greatest contrast the law of mind proposes to a materialist or physicalist perspective is the definitive direction in which time flows, from past to future, in which the present is affectible by the past, but not the future (323). Such directionality – while of no consequence to purely physical affectations (that is, removed from the developmental teleology we are presenting), for which such temporal orientation is no different than a physical direction – is essential to the very proposition of the one law of mind, that ideas spread continuously, and stand in relation to other ideas, losing intensity but gaining generality in the process (313). In this, there is no reversibility of effect or process, symmetrically or otherwise, as the experience of the unidirectionality of time itself (whereby present may be affected by past and not future) is a quintessential feature of conscious phenomenology, what we are prone to call *being*. A living being (a *personality* in Peircian terminology) has a specific relationship with the temporal which is the basis of their own (personal) developmental teleology, in which it both occurs and becomes; it is lived *in* time, with a consciousness *of* such time, affected by the past *and* "already determinative of acts in the future to an extent to which it is not now conscious" (331).

The fundamental mistake within the aforementioned argument is that it suggests that semiosis is in fact secondary to other intentional causality, and is a specific type of causality, whereas the proposal of Peircian cosmology is that causality rightly needs to be studied in the light of semiosis, not the other way around. Intentionality is not grounded in or emergent exclusively from mind, but mind is a natural emergent from the intentionality of Nature's own semiosis, as an emergent *quality* of the greater semiosphere. That semiosphere, as we have contended throughout the discussion, precedes the advent of life or mind, as we have said along with Hoffmeyer and others, that "life was from the very beginning suspended in a universe of signification," where constitutional degrees of subjecthood must be attributed to the pre-minded environment itself – the biosphere or semiosphere – where degrees of subjecthood must be attributed *all the way out*, as boundaries create such subjectivities within and without. The "phenomenon of matter" itself is "but the result of the sensibly complete sway of habits upon mind" (1892 c: 348): where the "fundamental elements of consciousness and their physical equivalents" (349) are homologously outworked through either the increasing of diversity, where chance is operative, or the increasing of uniformity, where habit taking is operative. It is a misapprehension to suppose the psychical and physical aspects of matter "as two aspects absolutely distinct," (349) as even the mechanical laws which govern the realm of matter "are nothing but acquired habits, like all the regularities of mind, including the tendency to take habits."

> Viewing a thing from the outside, considering its relations of action and reaction with other things, it appears as matter. Viewing it from the inside, looking at its immediate character as feeling, it appears as consciousness. (*ibid*.)

Matter is a *kind* of mind, and from our anthropocentric perspective is really only *kind of* mind, lacking obviously a great deal of the spontaneity of mind, not to mention many other processes we associate with living systems. Further, that if we take our observations in the opposite direction, that is, looking for levels of mind and complexity above what we might call the human semiotic condition, we find ample evidence of further synechistic development of mind, and also further developments which suggest we are not at the top of any hierarchy, but somewhere in the middle of an appropriate scale. There exist, above the level of complexity of our own human mind levels of conscious complexity as unfathomable to the individual human mind as the corpus of that mind is to its constituent cells, and all contemporary life (of every individual mind) is arguably shaped and influenced more by the ideas and metaphorical conceptions of these minds than of their own discrete agency. Examples of such would include (though certainly not be limited to) such *minds* (personalities) as those belonging to nations or corporations, and the obscurity of those personalities to the *minds* (personalities) which compose them, and that stand in relations with them. We are, again, best served by returning to the ideas of Hoffmeyer regarding the principles governing swarm dynamics and the developmental hierarchies of nested *Umwelten* within complex living organisms: as compositional constituents of such personalities as nations and corporations, the human *Umwelt*, at the level of the individual agent, is both irreducible to and inseparable from the larger personalities, in yet another case of Scalar hierarchical nesting of wholes, which in turn are parts within wholes.

There is a curious characteristic of larger personalities than humankind which may help to better explain our own human semiotic condition, in the division created at the boundary of such a personality. A corporation, for instance, is composed of individuals whom we would each rightly call personalities, and the personality of the corporation is not simply the aggregate of those which make it up, nor is it restricted to just those compositional personalities, but is something altogether different. When a corporate personality makes a decision – or more correctly, generates an idea – it does so through a process of collective decision making in one of many fashions between the a particular selection of the (human) individual compositional personalities. These (human) personalities, when acting in the function of the corporate personality, however, must and do prioritise the corporate personality above not only any and all constituent personalities, but the very human level, prioritising the interests and persistence of the corporate personality over and above even humanity as a whole. A good example of such prioritisation can be found in the recent revelations through Lenny Bernstein that ExxonMobil was aware of the effects and extent of human induced climate change as early as 1981, while maintaining a public stance of climate change denial and investing millions of dollars to promote such a stance[9]. Indeed, a corporation can live on long after its (human) founders have passed on, and has an entirely different existence, and indeed, relation to existence, than any human personality who has ever existed. A corporation has functionally no interest in even its constituent 'parts' beyond its own select interest of a function of the corporation being served. As Bernstein writes,

> Corporations are interested in environmental impacts only to the extent that they affect profits, either current or future. They may take what appears to be altruistic positions to improve their public image, but the assumption underlying those

[9] http://www.theguardian.com/environment/2015/jul/08/exxon-climate-change-1981-climate-denier-funding

actions is that they will increase future profits. ExxonMobil is an interesting case in point.

In prioritising its own particular level of hierarchical development above those levels which make it possible (functionally, ontologically and otherwise), the corporate personality is functionally blind to its own potential to undermine the legitimacy of its own existence. A corporate personality is a very different *kind* of mind and *being* than its human constituents in quite a number of striking ways, not the least of which being the conditions of their existence. A human being requires continuous sustenance and maintenance, a functional environment and far from equilibrium conditions at all times, not to mention a host of other needs which may be attributed. A corporation requires only the continuous generation of profit for its continued existence. A consequence of the acute influence of the corporate personality on contemporary life has been the application of this indispensable requirement of the larger personality upon the human semiotic condition: to fulfil any and all human needs is functionally accomplished through the requirement for the continuous generation of profit, and herein other constituent levels of semiosis are enveloped and subsumed (or tamed and domesticated if you like). We find at the level of the corporate personality, consciousness – not any great development of integration, but a division of itself from the grounds of its own legitimation – we find an increase only in ego: the surety of its legitimacy being in that it does *outlive* its constituent personalities, the ego of the corporation an illusion of immortality for its constituent creators. So too is our hubris.

The argument that semiosis begins only with the emergence of living or proto-living systems and processes is mistaken for several reasons. As conceded in the response to the previous argument, semiosis requires relations and interpretants, and it is the essence of the current counterargument that the subjectivity required for an interpretant is to be found only in living and proto-living systems. This represents a fundamental misunderstanding of objective idealism, which, for the wintry reception it receives is not whatsoever a new idea, but follows a tradition Peirce picked up from Schelling, "and Schelling from Plotinus, from Boehm, or from God knows what minds stricken with the monstrous mysticism of the East" (*ibid.*: 313), and certainly represents a misunderstanding of synechism. The subjectivity required by semiosis (indeed, by Peircian semeiotic) was prevalent throughout a pre-life or pre-proto-life biosphere, and indeed, the biosphere emerges out of the semiosphere which preceded it. In the advent of living and proto-living systems, we certainly witness the emergence of ego, particularly at the human level of complexity, and only an increase in such ego as we advance along that scale of complexity. The quintessential flaw of that ego is that it is blind to the synechism of its own emergence, prone to elevation and prioritisation of that intensely developed selfhood. Such a discrete unity of the ego, according to synechism, is largely an illusion of that same ego, and one which features quite heavily in all justifications for the concept of ownership.

Against pansemiosis: limited sufficiency of dyads

The final argument specifically against pansemiosis proposes a limited sufficiency of dyadic explanations for causality without semiosis, and as such, a superfluity of explanation through triadic relations for purely physical processes. The argument proceeds that, as demonstrated by Peirce, semiosis essentially involves a triadic relationship; but *mere* physical processes are readily explained in terms of dyadic relationships of causal constraint and necessitation. That is, where physics and chemistry already provide a sufficient causal explanation of what happens, and how, and why, there is then no requirement for an additional semiotic explanation, as there is nothing more to be explained.

My response to this argument is threefold: firstly, addressing what *limited* sufficiency is provided by purely physicalist causal explanations within a Peircian semeiotic framework; secondly, addressing the implications of the materialist dyadic causal conceptions, and how even the materialist position in its explanation of the cosmos presents clear evidence of a tendency of primordial habit-taking; and finally, addressing a prominent failing assumption of the mechanistic paradigm, concerning precise determination by strictly physical laws.

We must concede a *limited* sufficiency of causal explanation of mere physical processes according to both the emergentist and materialist positions. Within the atomist or reductionist mechanistic paradigms, there is no requirement for any *additional* semiotic explanation, no need for an explanation of semiotics at any point in the process. For emergentist and other (property or substance) dualist conceptions, a semiotic explanation becomes required at some point in the process, but for purely physical (or pre-semiotic) processes, the materialist position suffices for the dualist and emergentist to explain any questions that may be raised within the confines of those paradigms. The sufficiency of explanations in terms of dyadic relationships of causal constraint and necessitation is limited, not only in what it can explain, but limited in sufficiency also to materialist/physicalist and dualist/emergentist conceptions, and is entirely insufficient to respond to the questions posed by the Peircian objective idealist position.

Within objective idealism (and within Peirce's larger pragmaticism), demand for causal explanations extends beyond formal and efficient causes, as previously detailed. The sufficiency for emergentism and other dualist ontologies of the materialist/physicalist explanation of pre-biological causality is provisional that all explanations must be *a priori* limited in scope to only formal and efficient causes, whereas the ethical convention for the use of signs as a process of reasoning of Peirce's pragmaticism whereby the sum of consequences constitute the meaning of a conception (CP 5.9), demand a more thorough explanation according to all of Aristotle's four causes. In this way, the emergentist and dualist conceptions are unable to account for semiosis as more than an emergent quality (or even an epiphenomenal quality), and cannot account for the pre-biological semiosphere whatsoever. For the objective idealist, certainly only a portion of an explanation is effectively offered by the physicalist cosmology, precisely as the *mixture* of freedom and constraint which makes phenomena to be teleological or purposive is exhibited in both physical and psychical phenomena. It is not simply a process of laws outworking on substances: such an explanation not only serves to bundle semiosis into the 'acceptable' mysteries of consciousness, but also ignores the evidence, even within the dyadic physicalist conception, of spontaneity that runs counter to the proposition that all phenomenon are precisely determined by law, as we will address further in the third part of our response.

The second part of the response concerns the implications of the materialist dyadic causal conceptions, and how even the materialist position in its explanation of the cosmos presents clear evidence of a tendency of primordial habit-taking in physical laws, and also by their own explanations agree tacitly that physical laws themselves have developed out of chance. As Peirce writes, habit is the tendency to repeat any action which has been performed before (1883-4:223), and, is an undeniable facet of everything in the cosmos:

> For atoms and their parts, molecules and groups of molecules, and in short every conceivable real object, there is a greater probability of acting as on a former like occasion than otherwise. (1887-8: 277)

This self generative generalizing tendency is presented in the very physicalist cosmology, in the expression of laws and the development of substances; the physicalist theory of the Big Bang and the molecular constitution of matter, and it is presented therein as primordial. The purely mechanical explanation presents a doctrine of the aggregations of trillions of molecules with like things acting in like ways because they are alike, according to a generality of law (1892: 347). It is unclear, according to that purely mechanical arrangement, how conservative forces could have brought the aggregates of trillions of like molecules together, however. Again, the explanation is insufficient without admitting to the evidence tacitly presented by even such physicalist conceptions. Much as in the creation story of Genesis, the truth lies hidden in what is not written: it often goes unnoticed that the children of Adam and Eve bred incestuously. Similarly, as Peirce writes,

> ... It is clear that nothing but a principle of habit, itself due to the growth by habit of an infinitesimal chance tendency toward habit-taking is the only bridge that can span the chasm between the chance-medley of chaos and the cosmos of order and law. (347)

Moreover, as Peirce insists, even such conformity with law itself requires an adequate explanation, one which is simply not to be found within the physicalist conception:

> And since Law in general cannot be explained by any law in particular, the explanation must consist in showing how law is developed out of pure chance, irregularity, and indeterminacy. (1887-8: 276)

The deficiency of dyadic materialist explanations is that they cannot adequately explain even regularity of the cosmos as it presents to us today, not only in terms of material and final causes, but even within such physicalist explanations and paradigms, the question remains of what conservative forces acted against expansive forces to allow for gravity to 'take over' and to create such a uniform cosmos as we do find. Again here it is worth repeating that the tychastic objective idealism and associated cosmology put forward by Peirce is no mere abductive storytelling or speculating, but a systematic result of his study of the formal laws of signs, and particularly the one law of mind. The physicalist and materialist paradigms have within their own explanations truths which lie hidden in what is not written, and would not be uncovered by the questions elicited by such paradigms themselves, just as it is not often brought up in churches that incest was tacitly required by *that* particular creation story.

The final part of my response to the argument of the limited sufficiency of dyadic explanations for purely physical relations is that they simply do not hold up for even description of the purely physical world and physical phenomena. In addition to requiring the ability to explain regularity and Law itself, as Peirce contends (276), "We enormously exaggerate the part that law plays in the universe." He proposes that this is likely due to our own semiotic condition (indeed, our *Umwelt*), whereby it is a habit of mind generally to bring to prominence that which is deemed most relevant, and it is through the regularities of the universe that the mind finds what it does to make sense of. That which is less readily sensible to the mind loses relevance, much as in the process of visual encoding which occurs in the visual cortex, whereby only the bits of information of a scene which the eye is taking in that display change are 'updated' by the visual cortex, with the remainder of the image unchanged, resulting in the acute detection of visible movement we are capable of. In the case of our own semiotic condition, it is because of the conspicuousness such regularities play in our making sense of the information brought to us by our senses of the world that such regularities lead us to discard any relationships of irregularity we find as inconsequential, even when they challenge the idea that every phenomenon is precisely determined by Law. We are, however, surrounded by evidence of an arbitrary element to the cosmos itself, that suggests without question that the events even of the purely material universe obeying laws and dynamics, do so less completely than our prioritisation of the concept of Law might suggest: and that evidence is *variety*.

Variety, and hence the spontaneity or chance of some form which it must be attributed to, unquestionably surrounds us in living Nature. However that is not the argument we are currently tasked to engage with, and therefore the argument must be foremost agreed to that such variety (and hence such spontaneity) is readily observable in the cosmos in examples that will be accepted as being uncaused by life, mind, or semiosis, to which that spontaneity might otherwise be attributed. The arrangement of our particular solar system presumably has resulted from the outworking of purely physical Laws, with no *minded* intervention. From observable data, however, our solar system is quite atypical in its distribution of hard planets and gas giants when compared to others, and even when looking at our solar system in isolation, the variety of compositions, behaviours and relations are nothing short of exquisite. Remember that for such varieties, Darwinian arguments, which are inescapably both teleological and semiotic, cannot possibly apply, as according to the physicalist (and emergentist) conception, "niches" either ecological or semiotic cannot be proffered, and we are again left with no recourse other than to admit a primordially active element of chance and spontaneity to the cosmos itself to explain the variety and relations within even our own solar system and its planetary bodies compositions and relations. From the evidence of the variety of purely physical substance, mere motions of matter obeying laws of dynamics, we are confronted with the reality that we have no clear grounds to accept that every phenomenon – even of the purely physical – is determined precisely in its minutiae by Law alone, and are implored to accept the active hand of chance. Above all,

> a genuine evolutionary philosophy... is one that makes the principle of growth a primordial element of the universe.... But a pseudo-evolutionism which enthrones mechanical law above the principle of growth, is at once scientifically unsatisfactory, as giving no possible hint of how the universe came about. (1892 b: 331)

Against panpsychism: complexity of mind

Additionally are the arguments against the perceived panpsychism of objective idealism, in understanding physical events are but degraded or undeveloped forms of psychical events to connote that everything material, however small, has an element of individual consciousness. While objective idealism does not entail the definition of panpsychism as such, it does share enough similar aspects to warrant responding in turn to every criticism of panpsychism in effort to better clarify the Peircian position of objective idealism in the process of so doing. The first argument against panpsychism regards the complexity of mind itself – that even the simplest mind – is necessarily systematically complex, otherwise it would not be apt for any of the nuanced functions that minds variously and distinctively perform. Thus mind cannot exist until systems of requisite nuanced complexity emerge, and so mind could not have existed in the earlier phases of the cosmic evolution or in ultra-high-energy regions of the universe today.

This position, represents a fundamental misapprehension of the concept of *mind* within objective idealism, largely due to an insufficiency of terminology. This noun deficiency is itself due to the larger historical dialogue, particularly the influence of dualist and mechanistic conceptions, which have selfishly horded the concept of *mind* under the strict definitions we covered in Chapter 1, leaving an idealist of any persuasion in a situation similar to an alien trying to put forward an idea in a foreign tongue. In the processes we have described, whereby the prevailing instrumentalist mechanistic and dualist paradigms have defined and divided, substantialised, qualitised and nominalised mind into all of their various strict definitions, they have left very little room for the objective idealist position to *breathe new life* back into the term *mind*, but that is precisely what is required; and rather than engage in further neologisms, I feel it is my obligation to defend the definition of mind put forward by objective idealism without alteration or addition.

The Peircian objective idealist is compelled to address such simplistic and narrow definitions of mind as entirely insufficient, primarily as a blindly reckless form of categorization, whereby a single entity is being mistaken as separate every time it is encountered, so as to suggest that one are many. Categorization, in this regard, while possibly the most useful conceptual tool at our disposal, is possibly also the most dangerous, for when applied incorrectly, the entire categorical project is worse than useless, in that it can lead to false assumptions. As "all human certainty consists merely in our knowing that the process by which our knowledge has been derived are such that have led to true conclusions" (CP 2.693), what categories we employ and apply require some form of checks and balances to their justifications, or risk being entirely pointless (or worse, detrimental). The concept of universal categories is central to philosophy, but to render a *regulative principle* as more than a mere "intellectual hope" (1887-8: 275), one must divorce the universal from the individual with the same stringently applicable conditions; that is, such categorical projects must follow the same scrutiny as for universal categories, and we must not be drawn to the creation of unnecessary and superfluous categories in our investigations. We should not, for example, mistake different stages of the same *thing* as different, beyond the temporal or developmental differences of the differing states of the same thing (the same water in differing states of solid/liquid/gas, or the same butterfly in differing stages of development) ontogenetically, nor should we admit an infinite regress of categories, but seek to group like things according to varying criteria of likeness. Stages of growth, for instance, while vastly different for different beings and species, can be considered of a likeness, such as in metaphorical entailments pertaining to such stages of human pubescent growth described as "blooming" as a flower, or perhaps "coming out of her shell," or "spreading her wings," and such categories of likeness must be kept separate from categories such as species or genus which define fundamental *differences*, as opposed to such likenesses. Such divisionary categories must be applied with the diligence and due care applicable to universal categories, and need be guided by the application of universal categories to ascertain where such differences may in fact reside.

Precisely guided by such universal categories as proposed by Peircian semeiotic, we find that within the vast gulf of difference between what examples we can find of mind and matter, that "all alike present that mixture of freedom and constraint, which allows them to be, nay, makes them to be teleological or purposive" (1893: 2), and that such mixture of freedom and constraint is not of the character of *likeness*, but a fundamental and primordial sameness – of substance, origin, and subject to the same developmental teleology. Peircian objective idealism proposes not a counter to emergentism, but a more radical and thorough emergentism which accounts for such processes according to all of Aristotle's four causes, and indeed proposes mind as emergent semiotic causation, but attributes such emergent semiotic causation directly to the cosmos itself, as an outworking of the same process which has been the self generative potential of the cosmos itself from its emergence out of its own potentiality. Nor, as we have said, is such a position to suggest that the functions and characteristics associated with levels of developed consciousness, are coextensive throughout lesser developed versions of the same processes (that is, developed in the direction of increasing uniformity as opposed to increasing diversity), with the degree to which we can attribute certain developed aspects, characteristics, abilities and functions of minds, such as consciousness, intelligence, or self awareness restricted to appropriate stages, levels or degrees of emergence, strictly directional in time.

The first and simplest distinction we could draw would be to discriminate between what we are referring to as *mind* from an objective idealist perspective, and what we might be better served referring to from herein as *minds*, when properly indicating the phenomenon of complex *minded* life. In making this distinction, we are offering grounds to proceed with our efforts, while remaining true to the intentions of Peirce, and indeed

Schelling and his transcendental idealism, from which Peirce borrowed a great deal. With this distinction made, it must be absolutely conceded that minds – even the simplest of *minds* – are indeed complex systems. That *mind* is also unfathomably complex should also be mentioned, though we will attempt to draw such a portrait of *mind* only indirectly, as primordial Firstness is like all other Firstness, and defies of itself any direct description: the moment we try to talk about Firstness, we do so only through our own Thirdness. But that *minds* are complex systems is equally undeniable, and that such complex systems require (among other things) two necessary conditions: connectivity and diversity. As we have shown, linear deterministic systems can be described in the Peircian framework as the result of habit-taking. Evolution, however, is unavoidable, and irreversible by complex living systems; by living, we influence evolution with our choices through autopoiesis over scales of time we as beings are incapable of experiencing.

Systems are composed of elements in relation, with complex systems exhibiting (and requiring) both high connectivity between elements, and a high degree of diversity: it is the complexity of relations within a system that defines it as complex. That such connectivity and relations are essentially and fundamentally triadic relationships of semiosis should be attributed without further justification, but we are tasked rather to describe how *minds* are just one ontogenetic expression of the *mind* we are attempting to describe in silhouette. Within the Peircian objective idealist conception, *minds*, as we have contended, are best conceived as emergent semiotic causation, an outworking of the same process which has been the self generative potential of the cosmos itself from its emergence out of its own potentiality: that is, *mind*. It is not by universal laws or Law that life or *minds* emerged, but by habit-taking and through the one law of mind, whereby the expression and phenomenon of life (and *minds*) establishes itself locally through spontaneity or chance and the further taking of habits. *Minds*, subject as they are to the inescapable directionality of time, could not have existed in phases of the cosmos predating the generation of the complexity of complex systems on which they depend. *Mind*, by contrast, is the very self generative potential of the cosmos itself, and predates any and all complex systems it composes, and predates the phenomenon of *minds* as completely as it predates anything else we might rightly describe as a phenomenon.

Against panpsychism: functions of *mind/s*

The second argument against panpsychism regards the functions that *minds* paradigmatically perform – production of intelligent behaviours, sensory receptivity, interpretation of signs, production of signs, communications through signs, and the like – are all functions distinctive of living beings, systems and processes.

Further to the distinction we have made in the previous counterargument, in separating the concepts of the *minds* of living beings and the *mind* of Nature proposed by objective idealism, we follow Peirce in contending that habit taking is a primordial outworking of *mind*, "and with it its peculiar characteristic of not acting with exactitude" (1892 c: 346) due to the tempered influence of chance and spontaneity, and that such "habits are general ways of behaviour which are associated with the removal of stimuli" (348). What is proposed by objective idealism, is that there exists no fundamental division between matter and mind, and that the *substance* of matter is of mind, which has been overcome by habit, while at the other end of such a spectrum we find spontaneity and chance dominant and the development of complex systems such as *minds*, and beyond: "phases of one and the same process of the growth of reasonableness."

The functions of *minds*, specialised to their own degree from *mind*, are indeed general functions idiosyncratic to living systems, and hallmarks of the evolutionary history of life itself. And it is true that what we may call inert matter is of such a degree of difference from *minds* as to display outwardly no such corresponding functions. That life and *minds* are of a vast scale of magnitudes of difference from what we call matter or substance is not to concede to the dualist or emergentist that such difference requires separate ontological categories, as "all mind more or less partakes of the nature of matter" (349), (and here Peirce refers to both *minds* and *mind*) with *minds* equally phenomena necessarily of embodiment as we have shown throughout this discussion. That different functions would accord to different stages of development does not run contrary to this idea any more than the different functions available through development within different versions of developed *minds* and their capacities.

> Viewing a thing from the outside, considering its relations of action and reaction with other things, it appears as matter. Viewing it from the inside, looking at its immediate character as feeling, it appears as consciousness. (*ibid*.)

Just as there are an infinite number of divisions between the numbers zero and one, so too are the outworkings of *mind* of an infinite degree of difference in its own manifestation. The "imperfect and qualified existence" of all phenomena are determined by further phenomena and substrates of phenomena, as "that which underlies a phenomenon and determines it, thereby is, itself, in a measure, a phenomenon," in a process of emergence by degrees, whereby functions are attained according to new levels of freedom and constraint, where emergence *becomes* possible. Such functions, according to Peircian cosmology, indicate towards material and final causes, and are naturally emergent at the levels of complexity that they become necessary, particularly for the exportation of entropy to the environment. As we have said, the functions and characteristics associated with levels of complex developed consciousness, life and *minds* are not coextensive throughout lesser developed manifestations of *mind*, and just as the richness or poverty of an organism's *Umwelt* is determined at the organisms own level of complexity and development, so too is the degree to which we can attribute certain aspects of mind, such as consciousness, intelligence, or self awareness restricted to appropriate stages, levels or degrees of emergence, and such attribution should follow observable evidence of just such causal signatures.

Against panpsychism: *mere* consciousness or feeling

The next argument against the panpsychism of objective idealism and Peircian cosmology concerns what constitutes such claims of consciousness or feeling attributed to anything other than living and proto-life systems. Panpsychism is most often proposed as pertaining to just one aspect of *minds*: not intelligence, not motivation, not signification, but merely *consciousness*, or, on some accounts, *feeling* (presumably as an aspect of consciousness). One reason sometimes given for this view is that consciousness is too different and too mysterious a phenomenon to be explicable in terms of physical theory, therefore it must be a peculiar non-physical phenomenon (various dualist constructions). It is claimed by such panpsychists that consciousness nonetheless attaches to or is inherent in all physically constituted things. Next it is assumed that because consciousness is not physically produced, it must have existed all along in whatever physically constituted things or processes there are or have ever been. But this assumption is unwarranted, for wherever there is no discernable or discoverable evidence of consciousness (such as in particle physics, quantum physics, high-energy physics, inorganic chemistry, meteorology, etc.) there is no warrant at all for the view that those things/processes are imbued with consciousness (or feeling either). Further, even if consciousness were indeed too different and too mysterious to ever be explicable in terms of physical theory, this does not entail panpsychism. For example, it might be that this mysterious quality emerges, exists for a time, and then disappears, or that it prefers some physical environments over others, or that there might not be 'enough' of it to permeate the entire physical universe, given cosmic expansion, etc., etc.

As this objection contains a number of systematic arguments in sequence, our response will aim to address those objections following the same sequence. Firstly, Peircian cosmology and objective idealism are indeed culpable of separating aspects and functions of minds from the larger concept of *mind*, and indeed claim only that a possibility of *feeling*, as an aspect of the greater consciousness of *mind*, can be attributed to that which has given "sensibly complete sway" to habits upon *mind*, in its manifestation as matter. Mechanical laws, according to Peircian cosmology, are nothing more than the acquired habits of the cosmos, a function of the regularity of *mind* (349):

> like all the regularities of mind, including the tendency to take habits, itself; and that this action of habit is nothing but a generalisation, and a generalisation is nothing but the spreading of feelings.... the consciousness of a habit involves a general idea.

For Peirce, matter is a kind or type (a specialisation) of *mind*, and as such all matter, all existence, has the general character of an *idea*. Again, our terminology works possibly against our intentions, and it is necessary to define what constitutes an idea in the Peircian context, for such shares little with other commonly accepted definitions of idea. An *idea*, in this definition is indeed a generative of *mind*, but not restricted to *minds*, and all phenomena in existence shares this general character of an idea. An idea consists in three elements:

> The first is its intrinsic quality as a feeling. The second is the energy with which it affects other ideas, an energy which is infinite in the here-and-nowness of immediate sensation, finite and relative in the recency of the past. The third element is the tendency of an idea to bring along other ideas with it. (1892 b: 325)

As Peirce remarked elsewhere (1892 c: 350), his own understanding of what an idea is matured as he drew away from his own nominalism, moving from a conception where "a person is nothing but a symbol involving a general idea," to one that encompasses every general idea as having "the unified living feeling of a person." *Feeling*, in this, does indeed have a subjective rather than objective extension, and plainly such subjectivity of feeling as attributed to the physical realm is indeed problematic for physicalist and emergentist positions; subjectivity or subjecthood without personality. As we have previously stated, more complex functions of minds such as consciousness, intelligence, or self awareness are necessarily restricted to appropriate stages, levels or degrees of emergence, and represent the continuous diversification of chance-spontaneity, though along the spectrum between such manifestations of complexity and hidebound matter, a degree of feeling and chance manifest universally in all phenomena.

The accusation here is that objective idealism is only prepared to admit an aspect of *minds* (particularly *feeling*) as inherent in the physical (as a degraded specialization of the psychical), and while the denunciation is to a degree correct, it overlooks one of the prime contentions of the objective idealist position: that such *minds* are merely aspects themselves of *mind*. The phenomena of *minds*, as a particularly developed specialization of *mind*, emerge not from the functions of any universal laws or Law, but from the habits and relations that life itself establishes locally. Subjecthood, as we have contended, is not binary, but is a *more or less* phenomenon, with intentionality not restricted to *minds*, but a function and outworking of the self-generative potentiality of *mind*: Nature itself.

The next objection is that consciousness (in its "entirety," as attributed to *minds*) is too different and mysterious a phenomenon to be explicable purely through physical theory, therefore it must be a peculiar non-physical phenomenon. Again, this is but a simple return to the familiar comfort of dualist ontologies prepared to accept such substance approaches as we covered in Chapter 1, and to the Peircian objective idealist represents an entirely inadequate cosmology. The objection proceeds that panpsychism claims that consciousness in some form (in the Peircian case, *feeling*) nonetheless attaches to or is inherent in physically constituted things, and being not physically produced, must have existed all along in all physical processes and phenomena. While this objection narrowly applies to Peircian cosmology, it does so from back to front, and with inherently dualist assumptions. Indeed, within the framework we are presenting, *mind* has existed all along, and

> was an intensity of consciousness there in comparison with which all that we ever feel is but as the struggling of a molecule or two to throw off a little of the force of law to an endless and innumerable diversity of chance utterly unlimited. (348)

Mind, to the objective idealist, is not a substance or quality attaching to or inherent in physical phenomena or processes, as such physical process and phenomena have "no existence except as a specialization of mind" (349): *mind* is not a substance; substance is a specialization of *mind*.

The objection, however, proceeds that where there is no discernable or discoverable evidence of consciousness (or *feeling*) that there is no warrant whatsoever for the view that such things and processes are imbued with consciousness (or feeling) of any description. The signs of consciousness expected in such a case are unquestionably signs of life and the functions distinctive of living beings and systems discussed above, with the contention being that in inorganic physics and chemistry no such evidence of consciousness exists. Again this position represents a misapprehension on two accounts: the first being that, as we have contended along with Peirce, even the materialist/physicalist paradigms and associated cosmologies present the self generative generalizing tendency proposed by objective idealism as primordial within the very molecular constitution of matter as a tendency of habit-taking – that is, that psychical processes do indeed determine physical processes – and secondly that particular functions, as we have said earlier, associated with particular emergent phenomena or levels of complexity, are simply not coextensive throughout the entire domain of *mind*.

Firstly, as we have discussed above, the materialist cosmology tacitly contains within it evidence of both primordial chance and primordial habit-taking, supporting as it does a Peircian cosmology above itself as being more comprehensive in its explanations, as the physicalist paradigm itself is incapable of eliciting the very questions which lead to such realizations. As in the case of the perceived dichotomy between objective idealism and emergentism, no dichotomy exists between objective idealism and the emergentist or physicalist paradigms in regard to the purely physical *history* of cosmological development, and as in the aforementioned case, the objective idealist position is providing a more thorough explanation for the same *becoming story*, one which accounts for such processes according to all of Aristotle's four causes, rather than limiting the scope of our understanding to only formal and efficient causes. Objective idealism proposes not that the materialist/physicalist cosmology is *wrong*, but that it is deficient and insufficient. It is not a different *story* (*history*) being offered by objective idealism in counter to physicalist or emergentist conceptions, but a more complete narrative accounting of that same story, motivated by a strict ethical convention for the use of signs to insist on the inadequacy of any causal explanations that fail to account for such according to all of Aristotle's four causes.

Within a purely physicalist paradigm, restricted in causal explanations to formal and efficient causes, purely physical causation is adequate to explain phenomena and the history of the cosmos up until the emergence of life and proto-life systems, but under the requirements of pragmaticism, objective idealism identifies within that paradigm its own distinguished absence in explanation but presence in evidence of material and final causes, evidenced in the developmental teleology of laws and Law itself, not according to any such laws or Law, but according to freedom and constraint: chance and habit-taking as primordial within all existence. If there is a disagreement to be found between the Peircian and purely materialist conceptions, it concerns the relation and function of the chronological, with an insistence on the unidirectionality of time within the Peircian construct, wherein, by the law of mind, ideas spread continuously; like evolution itself the process is irreversible, and unavoidable due to the character common to all general ideas of generalisation, the vague possibility of a future state:

> any general idea is not a thing to be apprehended in an instant. It has to be lived in time.... it is already determinative of acts in the future to an extent to which it is not now conscious. (1892 b: 331)

This irreversibility of effect and process, while not a necessary feature of a purely mechanist or physicalist cosmology, is foundational to the semeiotic conception of the cosmos as we are presenting. That is, that time is not only a necessary condition of all experience, but is necessary for "the principle of growth [to be such] a primordial element of the universe" (*ibid*.), indeed for the very function and possibility of signs and semiosis.

Further, concerning discernable or discoverable evidence of consciousness, particularly in what we are otherwise inclined to classify as matter – atoms, electrons and quarks particularly – we must again reiterate several points made above and in the previous chapter. As we have said, objective idealism is not proposing that the functions, capacities and distinctive forms of subjectively intentional causality associated with life and minds are commensurate throughout the breadth of creation, but "that matter is effete mind, inveterate habits becoming physical laws" (1891: 293). In this proposal, a degree of *feeling*, with a corresponding degree of subjectivity or subjecthood, indeed permeates every facet of existence and all phenomena, and a reciprocal degree of intentionality corresponding to Husserl's Phenomenology and Peirce's alike. Such subjectivity and subjecthood, as we have said, is not a binary value, but is "a more or less phenomenon," and just as the functions and intentionality of *my* own mind are entirely incomprehensible from the perspective of the subjective *Umwelten* of the compositional neurons or electrons, as are the functions and intentionality of such nested systems equally incomprehensible to *me*, so also are we inhibited from an understanding of the subjecthood of other degrees of subjectivity to the mode we are accustomed to by the demands of our own ego. By degrees, as uniformity increases, subjectivity diminishes accordingly, though never entirely to extinction, just as such subjectivity increases and amplifies as diversity increases. The obvious problem of what subjectivity is then appropriate to attribute to such phenomenon as atoms, electrons and quarks, as such ideas of consciousness or intentionality from the perspective of a Husserlian Phenomenology clearly do not apply – though from the Peircian perspective, the one law of mind is applicable to every such phenomenon, as having the general character of an idea, and the *aboutness* of such corresponding intentionality is merely entirely given over to habit. The same process is operant: such "habits are general ways of behaviour which are associated with the removal of stimuli," (*ibid*.) and as we have said earlier, such subjectivity occurs and is created at all boundaries, becoming semiotically active sites, and objects to the subjectivity created at just such a site of activity. The degree to which we – that is, the formal I who writes – can recognise such subjectivities and selfhoods is challenged and frustrated solely by the degree to which we can recognise the illusions of selfhood of our own egos, the degree to which we insist upon just such a formal I which stands alone. That is, before we may find the mote in the eye (or mind) of an electron, we must first remove the plank from our own *I*.

Finally, the remainder of this objection states that even if consciousness were indeed too different and too mysterious to ever be explicable in terms of physical theory, this does not entail panpsychism. For example, it might be that this mysterious quality emerges, exists for a time, and then disappears, or that it prefers some physical environments over others, or that there might not be 'enough' of it to permeate the entire physical universe, given cosmic expansion, etc., etc. Further that non-physicalist explanations of consciousness do not automatically, and indeed seldom ever entail panpsychism: for example, Descartes' theological explanation of the existence of consciousness (that God has granted consciousness only to souls, and that animals and mere objects lack souls) rules out panpsychism.

It should be clear at this point in the discussion that it is certainly not the intention of this thesis to present Peirce's semeiotic and cosmology, particularly objective idealism, as any TINA (the-is-no-alternative-explanation) argument for the mysteries of mind and consciousness, and great effort has been made throughout to not only detail the merits and insights of such alternate and prevailing positions, but also their deficiencies and shortcomings. Having identified the insufficiencies inherent in prevailing definitions of mind, we have followed Aristotle, Schelling and Peirce in constructing our own tripod from which to investigate the signs of mind upon the history of the cosmos itself, and we have done so following the ethical convention on the use of signs proposed by Peirce's pragmaticism, and, as it does, an insistence on an Aristotelian completeness of causal explanations to expand beyond formal and efficient causes to include material and final cause, or simply be ruled insufficient for their purpose. Objective idealism is not here being presented as our only option – far from it – as detailed in Chapter 1, traditional, and the majority of twentieth-century theories of mind (and experience and perception) either radically separate mind from nature, or subsume mind as a mechanistic aspect or part of nature. In both cases, the systems based upon these theories have contributed significantly to the production of our current ecological crisis and our state of semiotic dissonance resulting from their paradigmatic dominance. Objective idealism is here being presented as an alternative which not only offers a more thorough and complete account of mind and the cosmos than prevailing alternatives, but in so doing illuminates a developmental teleology inherent in the cosmos itself, with profound resulting implications for human ecology.

The alternatives raised in the objection suggest a number of aspects of such traditional and prevailing conceptions of mind, first in the suggestion that mind may be a *mysterious quality*, which may exist for a time before disappearing. While it is certainly true that within the Peircian framework, all phenomena have an "imperfect and qualified existence," that is, they exist for a time then disappear, though as "a matter of more or less, so as to merge insensibly into nothing," *mind* is far more than a mere *quality*, and is instead the very self generative potential of the cosmos itself, and predates any and all complex systems it composes, and predates the phenomenon of *minds* as completely as it predates anything else we might rightly describe as a phenomenon. Following on is the suggestion that mind prefers some *physical* environments over others. While it is true that the phenomena of *minds* inescapably and necessarily requires the condition of embodiment, to say that mind *prefers* some condition or environment (physical or otherwise) entirely misconceives the position of objective idealism, whereby we

> will insist that all phenomena are of one character, though some are more mental and spontaneous, others more material and regular. Still, all alike present that mixture of freedom and constraint, which allows them to be, nay, makes them to be teleological or purposive. (1893: 2)

Subsequent to this is the suggestion that there might not be *enough* "mind" to permeate the entire physical universe, particularly with cosmic expansion. This position inherently falls back on substance definitions of mind, particularly those influenced by the mechanistic reductionist paradigm, which we have shown are entirely deficient for a conception of mind and Nature, and particularly human ecology and ontology. And further to being deficient, they are insufficient explanations according to the convention we have been following along with Peirce and Aristotle. Finally we have the alternative explanations for consciousness such as those provided by Descartes and other dualist ontologies. As we have said repeatedly throughout the discussion, it is a primary intention of this thesis to reject any dualist philosophy "which performs its analyses with an axe," and further, as we have contended, such metaphysical explanations are simply insufficient according to our convention following Peirce and Aristotle.

Sufficiency for attribution of *mind* or *minds*

The final arguments that we need to address in support of the objective idealist position are naturalistic arguments which represent a middle position of sorts held by many biosemioticians, and primarily concern the distinction between teleonomic and teleological processes. The arguments follow the same form, and apply to two aspects of the Peircian framework independently; namely *directedness* or *aboutness* and *intentionality*.

The first argument is that while *directedness* is an essential attribute of *minds*, its presence is not *sufficient* for attribution of mind or mindedness. This is consistent with Peirce's synechism, in that non-mind may shade imperceptibly into mind as it progressively acquires *enough* of the essential characteristics of mind. Directedness in itself is not sufficient for such attribution, because apparent directedness is exhibited by even teleonomic processes (which, being merely teleonomic, are not genuinely teleological or directed). Since directedness is presupposed by intentionality, these processes are not appropriately described as exhibiting intentionality either and so do not license attribution of mindedness to the process of their genesis or of themselves. That there are "differences that make a difference"[10] such as symmetry breaking in the flux of quantum processes, does not entail that such difference making is evidence of mind. Further, that while *intentionality* is an essential attribute of mind, its presence is also insufficient for attribution of mind, following the same form of argument as the former objection, ultimately asking why we should regard such a "smidgeon of intentionality" as *sufficient* for attribution of mind?

To begin with, it is worth examining the distinction between teleology and teleonomy, and the origins and purpose of that distinction. Colin Pittendrigh (1958: 390-416) introduced the distinction, and coined the term *teleonomy* specifically to stand in relation of contrast with teleology, and the term was introduced precisely to correct the "mistaken view [of biologists] that the efficiency of final cause is necessarily implied by the simple description of an end-directed mechanism." He goes further to clarify:

> The biologists long-standing confusion would be removed if all end-directed systems were described by some other term, e.g. 'teleonomic,' in order to emphasize the recognition and description of end-directedness does not carry a commitment to Aristotelian teleology as an efficient causal principle. (1958: 394)

The distinction of the teleonomic from the teleological is then immediately hostile to the Peircian Architectonic in that its very proposal is as a means of removing any commitment to Aristotelian causality, as is the goal of the ethical convention on the use of signs proposed by Peirce. The proposal of the category of teleonomy is further hostile

[10] For more on this, see Gregory Bateson's ideas on information being a 'difference which makes a difference' from the essay 'Form, Substance and Difference,' published in *Steps To An Ecology of Mind* 1970.

to synechism, as the same form of reckless categorization we discussed earlier (in this chapter, in the section *Against Panpsychism: complexity of mind*), in that the purpose the category serves is not ontologically derived, but derived descriptively to support the dialogue between mechanist and dualist/emergentist conceptions, and at the expense of other possible conceptions which account for such processes so much more eloquently, such as that which we are proposing. While the existence of what has been categorised as teleonomic process very much supports the Peircian conception of a universe composed entirely of signification, in which such processes of signification gain further autonomy and generalization through interaction, the distinction of the category itself is hostile to such a synechistic conception in that it is the creation of a superfluous category, not even one representative of difference or similarity, but which serves solely to progress a dualist ontological dialogue. The category of teleonomy is a conceptual missing link introduced in effort to ignore some rather glaring incoherencies in the accepted discourse rather than to expose or address them. The teleonomical is described as to apply to biological phenomena that *appear* to be end directed, and while it "does not carry a commitment to Aristotelian teleology as an efficient causal principle" also represents a drastic misunderstanding on Aristotelian causality in having regard for only efficient causality. As we examined in Chapter 3, the very concept of adaptation is characteristically teleological, and even Darwin uses the term *final cause* in his *Species Notebooks* (Lennox, 1993: 410; Darwin cf. B 5, 49; C 236; D 114, 135, 167; E 48-49, 146-147; M 154.). The creation of the category of the teleonomical is a reckless form of categorization for a number of reasons, and it suspiciously serves a purpose to maintain and reinforce the validity of the ongoing materialist/dualist paradigm it emerges from (and dialogically between).

It is the proposal of objective idealism that such processes are indeed teleological, and that while directedness and intentionality are insufficient for the attribution of *minds*, they are the semiotic hallmark of Nature and of *mind*, the natural condition of a universe perfused with signs.

Denouement

This chapter has attempted to present a detailed defense of objective idealism, requiring response to a number of arguments against its claims that matter is a particular specialization of mind, hidebound with habits. It has been our effort from the outset of this dialogue to seek a path past dominant dualist ontologies, particularly concerning mind and agency, as it is the persistence and dominance of just such dualist ontologies that have justified the course of human action on this planet, particularly concerning our relationship to Nature and our semiotic and biological environments, and our exacerbated condition of semiotic dissonance within those spheres. There exists no fundamental dichotomy between objective idealism and emergentism, as these two positions are describing the same processes, simply in less detail in the case of emergentism. While not a counter to emergentism, objective idealism entirely rejects the materialist and dualist derived conceptions – particularly of mind – which have so immeasurably influenced modern thought and the contemporary human condition (physically, biologically, semiotically and ontologically) as entirely inadequate for a conception of humanity as an emergent phenomenon within Nature. This is not to say that objective idealism is offering a different history than that offered by the physical sciences, but a more thorough accounting of that same history, through which we can see evidence of not simply habit taking and mere motions of matter obeying laws of mechanical dynamics, but within this same process the active hand of chance, tychism. *Minds*, as we have said, subject as they are to the inescapable directionality of time, could not have existed in phases of the cosmos predating the emergence of complex systems and substrates of systems that create the grounds of possibility for such phenomena. *Mind*, by contrast, is the very self generative potential of the cosmos itself, and predates any and all complex systems it composes, and predates the phenomena of *minds* as completely as it predates anything else we might rightly call a phenomenon. *Minds*, as we have said, are necessarily phenomena of embodiment, though *mind*, within objective idealism, is not a substance or quality attaching or inherent in physical phenomena or processes, as such physical processes and phenomena, as we contend along with Peirce, have no existence except as a specialization of *mind*: *mind* is not a substance; substance is a specialization of *mind*. In the next and final chapter we will be investigating in more detail the developmental teleology offered by Peircian cosmology: the purpose of Nature's aesthetic.

CHAPTER 11

Developmental Teleology: Learning from Nature's Aesthetic

"Nothing is evolved unless it is involved"

The Kybalion

In this final chapter, it is our intention to investigate what normative insights for human life and ecology may be drawn from the foregoing developmental teleology. In particular, we consider what may be gleaned from Nature's aesthetic, drawing largely, as did Peirce, from the insights of Schelling, to finally argue our case that existence is infused with meaning and purpose, and as self-reflexive, self-aware, minded beings, it is our glorious privilege to play a deciding role in the very *drama of creation* here and now.

What is important to understand here is not that the ontological *becomes* or is made teleological processually or historically, but that such ontological emergence is inherently teleological through the uniting of necessity and contingency in the actuality of being (becoming) itself. The necessary, self-made succession of Nature as existence *is* purposive (necessity), but such purposiveness is only actual for *minds* (self-organizing contingency). Meaning is only *actual* for *minds* through historical emergence, with such emergence occurring according to a purpose of actual becoming, of the creation of such subjectivities: the purpose of Nature. And while such meaning and teleology is inherently subjective for *minds*, "Nature speaks to us more intelligibly the less we think of her in a merely reflexive way" (Schelling 1988: 35).

Just as the creation of conditions favourable to more complex forms of emergence and organization occurs through the constraining of conditions within subvenient levels of complexity, the constraints upon freedoms of one level creating the grounds of possibility for new levels of freedom and capacity, so too is meaning forged and elevated with every new level of subjectivity, and such continuity of synechism can be found evidenced precisely in the dissonance created at the level of the human semiotic condition, whereby attributions of meaning no longer resonate with the grounds of their own possibility, an ignorance of the underlying synechism which grounds the sensory semiotics proposed by Peirce (and by emergentist biosemioticians), whereby ideas and concepts are not intermediary steps in (merely) phenomenological experience and understanding, but rather that which is external (to our own subjectivity) reaching out to us directly as signs and interpretations. Nature, in this way, is forever engaged with us in attempted dialogue, and the very pinnacle of our complexity – the manifestation of our ego, as the outworking of the very purpose of Nature as such subjective experience and becoming – is that which by its own design separates us, *subjectifies* us, from our own natural (natural emergent) resonance with Nature itself.

The greatest question remains to all of this: what difference does it all make? What then is the purpose of consciousness? Of subjectivity? Of Life, The Universe, and Everything? If existence, as we have contended, is perfused with meaning, then what does it *mean*?

The entirety of existence is a self-made necessary succession: the 'Course of Nature' *is* becoming through the development of subjectivity, but the *mind* of Nature is the whole of such subjectivities, or, as Plato put it; the Cosmos is a single living creature containing all other living creatures (Timaeus). Meaning, such as it exists, is essentially and necessarily subjective, and is forged at the sites of creation of such subjectivities, and their interactions. Objective meaning exists only in such subjectivities, as Schelling writes, "extend it to infinity and you lose all conception of purposiveness and understanding" (1803: 34). The phenomena of *minds*, as a particularly developed specialization of *mind*, emerge not from the functions of any universal laws or Law, but from the habits and relations that life itself establishes locally. Subjecthood, as we have contended, is not binary, but is a *more or less* phenomenon, with intentionality not restricted to *minds*, but a function and outworking of the self-generative potentiality of *mind*: Nature itself.

Semiotic Corruption

As we have contended throughout this discussion, the semiotic dissonance of the contemporary human semiotic condition has developed historically and culturally, in no small part due to the persistence and dominance of moderate enlightenment conceptions of humanity, and particularly Newtonian mechanistic metaphors and the influence of the Hobbesian mechanistic paradigm as a whole. Perhaps one of the greatest examples of this is to be found in the concept of *life force*, and through the insights of Schelling particularly, we can see how the very idea of *life force* "is a completely self-contradictory concept" (p 37), and really does not even fit the mechanistic paradigm according to purely physicalist conceptions.

There are at least four forces in the cosmos, but the *unrealised possibility* of forces is infinite, in that no force contains within it any form of upper limit (beyond, as we have discussed, the physics of black holes, which are somewhat beyond my humble understandings), except by the limits of another force (or the same force) opposing it. Forces always entail relations, all vector equations are simply stories of relations; purely physical interactions, the results (the sum of the equation/s) of which are either: rest, conflict, relative equilibrium (tension), or absolute equilibrium (annihilation). The cosmic conatus, or striving-to-become of *minds*, and life, and indeed the substrates of systems and processes which underlie such phenomena is not forces in balance, or somehow out of balance; it is not forceful whatsoever, but *involved*.

Nature is a conflict; we may even go as far as to say that everything we can rightly call Nature *is* perpetual conflict (in the physicalist sense). Forces (which, to be very clear, we are not suggesting are in any way outside of Nature, as we described in Chapter 9), in all their relations lend themselves to finality, to the end of the equation. Forces seek a resolution *of* themselves in a manner that favours mathematical modelling, and if it were up to the whim of forces, absolute equilibrium would make for a much less elegant universe than the cosmos we inhabit. Nature is what maintains the conflict: tychastic chance, as we have contended with Peirce, as a tendency toward unlikely states, functions very much as the contradistinction of entropy, "Force is in the long run dissipative; chance is in the long run concentrative" (Peirce 1884: 221), and the outworking of one side of the antithesis informs the state of the other. As Schelling contends, there is *something* which strives beyond these barriers of reason; again in effort to avoid further neologisms, we have followed the Stoics and the Peripatetic school of Aristotle, and also Descartes, Spinoza, Leibniz, and even Hobbes in the use of the term *Conatus*, to describe this striving to become that might, in other places be called chance, and in others *mind* and also Nature. This *Conatus* is not a force, however, and does not *act* forcefully: from the molecular composition of matter to the complex manifestation of life and *minds*, the entirety of the cosmos proceeds by way of recognition, *involvement*.

In mapping the human genome it has become clear that the vast majority of DNA and RNA function in the realm of bioacoustic and bioelectrical signaling, that the 'building blocks' of life are less than solid strata, but are much more *involved*, processual, malleable and dynamic than our mechanistic metaphoric entrapment would otherwise have convinced us. Quantum physics, at the sub atomic level, describes this same process as *symmetry-breaking*, and the Peircian response would be to embrace such insights as fundamentally supporting the position of objective idealism and the entire Peircian architectonic in that such processes are processes of recognition, of ongoing differentiation, exhibiting the same mixture of freedom and constraint that identifies them as primordially semeiotic, teleological and *intentional*.

But if it is *meaning*, certainly it must *mean* something. *Meaning* is a funny thing though: it is never absolute, seldom objective, and even then such objectivity is a function ultimately of subjectivity. We live in a world of our own constructed meanings – and for the most part, it works for us. For the most part. We live in interesting times; the very globalised nature of the world we live in today demanded a new role of *meaning* some time ago, a new responsibility that it picked up in the process of its own becoming (evolving, involvement): *meaning* must now also be global, and recognition, particularly of brands or products, must extend beyond linguistic and cultural boundaries to contain the same message, or meaning. Human level semiosis has a tendency to overlook the *special character* of semiosis that operates not through force or forces, which specifically makes possible such non-linear transmission as occurs – "a sign determines an interpretant of itself in another sign, it produces an effect external to itself" (CP

8.191) – human level semiotic dissonance occurs when the human level created semiosis largely disregards the subjectivity that underlies all semiotic processes. Of course, we hold each other to the same expectation: there are few places on earth where ignorance of the law is a legal defence for anything considered a crime. And many things that might otherwise be illegal become legal if legally appropriate signage is displayed somewhere: for example, concerning the recording or searching of others, the defence of property with violence, or the keeping of dangerous goods or animals; and beyond minimal requirements on the definition of the sign itself, all responsibility is then redirected (by the existence of the sign) to any person who may be able to perceive the sign to interpret it accurately for themselves, or fail to at their own peril. Of course, we are not alone in creating demanding semiosis: such human signs are created by humans for humans particularly because life, in all its forms, is relatively fragile, requiring warning of perils that demand interpretation, often at the risk of death. Our physiological construction results from of the importance of getting meaning right when it counts: staying alive. To deprive an individual of the ability to interpret signs is a perilous punishment indeed.

But *meaning* means even more than that. Meaning is not free to be made up as one goes, nor is it restricted to whatever might have in purpose been *meant*. Music is an interesting consideration, as it contains none of the weight of interpretation of other types of signs, and by its own nature lends itself to subjective interpretation, particularly lyrics (which contain less of the emotive charisma of music as a category of experience), which can be misheard and invested with just as much *meaning*, and *mean* just as much to the involved subjectivity. *Meaning* is a process forged through involvement, it functions and becomes through a dialectic of freedom and constraint, which, as we have shown, always functions as a trichotomy. *Meaning* is *to matter*, and requires and creates subjectivities to *matter to*, even if they do get it wrong occasionally. We all get it wrong occasionally, such is the processual character of epistemology: in presenting Peirce's architectonic, I have been careful to avoid those arguments of his which have proven to be fallacious, or which have been proven wrong in the fullness of time and with further scientific progress, just as I cannot make the case for any of Schelling's insights using his own arguments concerning phlogiston, nor Aristotle in entomology. The thesis of fallibilism, as part of an ethical convention for the use of signs, is a necessary condition for the possibility of any knowledge whatsoever: what can be called knowledge is always an actual history, and proceeds by way of improvements upon its own deficits.

Within *me* lies a complex of *selfhoods*, millions upon millions of individuals cooperating in the operation of a singular subjectivity: a hive of hives constructing me like a human pyramid, my mind standing upon so many heads to be possible, a community forming my unity. The *I* (in/of/from) *me* is a hive of hives, community of communities, and a hive of communication. Alcohol's effects confuse some of those communications; inebriated, my feet seem someone else's perhaps, and far too far away from me, through clouded perspective my mind lies to my legs about distances and angles and horizons and makes *me* to look much like a badly operated marionette. Similarly, cancer manifests when a group of cells within a community fail to communicate with the conscious signal of the organism they are a part of, growing out of control and without restraint. As discussed in Chapter 5, the stability developed through scalar hierarchies is eroded as the boundaries between levels are bypassed because "different levels do not directly interact or exchange energy, but transact by way of mutual constraint," when recognition is removed, ignored or circumvented, natural function is suppressed. As we have discussed, suppression of a natural function results in disease, and can be otherwise considered an incapacity for freedom. As a *means to me*, getting meaning right is of varying consequence really: Personally, I am pretty sure I get *me* wrong all the time – and I might indeed be wrong about all of this (all of it that is my own ideas and suppositions, I am relatively certain of the historical accuracy of everything that remains), I have certainly been wrong before, and even the position put forward in this thesis is not entirely the one I began with. *Meaning* changes, and does so subjectively, and through the interaction – the *involvement* – of subjectivities.

Recognising Dissonance

We have contended throughout this discussion that Life, The Cosmos, and Everything is fundamentally *about* meaning, purpose, and is primordially teleological. There would be no proponent of any emergentist position who would deny that meaning surrounds us everywhere, that all living beings and systems live embedded in meaning, with sensory semiotics implying that ideas are not intermediary steps in experience, but the external world imploring us directly by subjective means, and the position we are putting forward is no more than an attempt at an explanation for the entirety of that process, using the same evidence, from a Peircian perspective. The question remains of what value this perspective might hold, what truth it might hold claim to, and what insights may be gleaned from such a perspective, even metaphorically. What can we learn from any of this? How may it be possible to recognise and overcome semiotic dissonance; to recognise the resonance of Natural biosemiosis?

What questions can we ask of Nature? What surety may be drawn from our conclusions? What means are available to us to rectify our own semiotic dissonance, and how can we even tell? And of equal importance, what are the implications of particular forms of semiotic corruption for our lives; how is the human semiotic condition relevant to human ecology *practically*?

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As we have sought to illustrate throughout the entirety of this discussion, every aspect of what it means ontologically (and as we contend, teleologically) to *be* human (indeed, *to be*) *is* semiotically and historically emergent: processual and relational. It is only through involvement that *anything* becomes, and it is only through the particular, through the parts, that the whole may be traced back: the whole may be grasped only through the particular, and through recognition of the particular.

In our efforts to identify particular forms of semiotic corruption, we must be particularly careful about what categories we employ. The inclination may exist, for instance, to make the distinction that human level semiotic dissonance is somehow, by its dissonant character, diametrically non-natural, again resorting to the familiar comforts of dualist ontologies; but this position is fundamentally mistaken, as, in all of existence, there is *nothing* that can properly be considered as non-natural. The human level of semiotic dissonance – indeed, the human semiotic condition – is itself a *natural* emergent, a result of the very outworking of Nature in the creation of such subjectivities, and a uniquely positioned emergent within such a complex of subjectivity *by degrees*, where, as self-reflexive, self-aware, minded beings, we are eligible to experience this unfolding process, and engage with this *Cosmic Conatus* on a level unavailable to less complex degrees of subjectivity.

Unnatural is a term generally reserved for our own (human level) creations and experiments upon creation, particularly those things which require thorough containment or separation from the biological, but even plastics and petrochemicals are derived from the carbon chain that is also the basis of all known life, and everything in the Cosmos is composed of the same 92 (natural) elements. Among such elements, there are certainly those which are biologically *unhealthy*, and there seems indeed no end to the manipulations that may be possible upon these 92 elements, even into new periodic elements, some of which are indeed detrimental to the biosphere and life on this planet. One of the larger frustrations to arguments concerning human ecology emerges from this very dichotomy presented in the idea of the non-natural or unnatural, effectively creating a false premise for the arguments about climate change particularly.

Such argument proceeds first through the distinction between human induced climate change and natural climate change patterns of the geo- and bio- spheres, arguing to differing degrees on the particular influence of human induced change over longer term climate patterns on the planet. What frustrates this argument is the false categorical implication that is made in separating human activity from that of the biosphere, as non-natural, unnatural, or otherwise. Human activity *is* the continued activity of the biosphere, the outworking of the *Cosmic Conatus* of Nature in the creation of such subjectivities, and while the development of such complexity is necessarily accompanied by increasingly more efficient processes of exporting entropy to the environment, a threshold has already been crossed in our own processual historical development whereby our subjectivity has become elevated to the degree that we *are aware* of such: we can be *involved* like never before. This argument grounded on the distinction between human induced climate change and *natural* climate change frustrates any effective considerations of the human ecological predicament because it begins from a position which inherently separates humanity from the natural ecology from which it has historically and processually emerged, and from which it is inseparable.

The Peircian architectonic we have presented throughout this discussion provides the grounds of possibility of a very different understanding of human ecology, our place within the biosphere and the cosmos as a whole: one primordially invested with meaning and involved in its own becoming. For hundreds of years now, humanity has been principally guided by one set of metaphors, reliant as they are on a view of the cosmos developed in the 17th Century which has largely never been allowed to be updated, and has been held above the rigorous demands of fallibilism. Within the Newtonian paradigm that we inherit, ontological categories such as *mind* and *minds* are epiphenomenal to the interaction of matter according to immutable laws of relation, and must be considered in terms of forces, but life is not forceful; life is *involved*. When conceived through the framework offered by the Peircian architectonic we have presented, it becomes glaringly obvious that human level semiosis becomes dissonant with natural (bio)semiosis precisely when it neglects or ignores the special character of semiosis — the phenomenology of signification — following the one law of mind, whereby nonlinear transfer of energy (and *meaning*) becomes the hallmark of such interactions, and instead becomes directional in its intentionality (rather than merely its temporality), ignoring the inherently dialogical process (which, as we have shown, always functions as a trichotomy); the *involvement* of biosemiosis.

Conceived in terms of Hegelian dialectics of the trichotomy of Representation, Recognition, and Labour (reconceived by Gare 2001 as Power), a clear hierarchy of prioritisation is demanded by Peircian cosmology, whereby any attribution of *value*, as a function of Representation, *must* follow hierarchically from processes of Recognition, and further, that any dialectical relations of Labour/Power, *must* also follow hierarchically from such value (Representation), *necessarily* a function of Recognition. *Any* other hierarchical prioritization or ordering of this interplay results in biosemiotic dissonance. While Hegelian dialectics have been extensively applied to human interactions, the degrees of subjecthood proposed by objective idealism, and the continuity of synechism suggest that such a conception requires a broadening of scope to include the "axiomatic identity of the semiosphere with the biosphere" (Sebeok 2001: 68), and that all dialectical interplay necessarily must follow from recognition, indeed recognition of all such subjectivities.

Within the human economic paradigm, which as we have contended, lower subvenient levels have no access or equivalent to, *value*, as a process of the dialectic of representation, is determined according to a hierarchy of prioritisation whereby said *value* is subject to and follows from the dialectic of power, with recognition applied categorically, rather than dialectically. The alternative proposal of resource based ecological and economic responses alter this hierarchy by elevating the dialectic of representation above that of the dialectic of power, in attribution of *value* according to praxis, but this interpretation also neglects the dialectic of recognition, and indeed the special character of semiosis, in that such applied representational values are resultant of and informed not by ongoing processes of recognition, but from a purely subjectified position, largely driven by the demands of ego to deny the phenomenon of our own emergence from and reliance upon the biosphere and biosemiosis.

The myopia of these positions is that they are astigmatic to the profound potency of metaphors they are in historical fact derived and emergent from: trapped within a paradigm of *forces*, where forces, for all of their infinite *unrealised possibility*, are simply incapable of the nonlinear energy transfer that is the hallmark – the *special character* – of semiosis whereby a sign "produces an effect external to itself," and does so through *involvement*.

In our efforts to identify particular forms of semiotic corruption, we must naturally proceed categorically, and in so doing must be particularly careful about what categories we employ. Of equal importance is the hierarchy of prioritisation according to which we apply such categories: While Peirce largely agreed with Hegel, particularly concerning stages of thought and cognition (1885: 237), he did not often employ the Hegelian dialectical categories, influenced as he was by not only his father's Logic, but also thoroughly bathed in the Romanticism and Romantic naturalism of Schelling and of Schiller's *Aesthetic Education of Man*, instead employing the categories of Ethics, Aesthetics and Logic. These categories subsume the Hegelian dialectical categories as follows: The dialectic of Representation, as a determinate of *value* is encompassed by the larger universal category of Ethics (as the ultimate determinate category for *value*); the dialectic of Labour or Power, as a determinate of relations is enveloped within the universal category of Logic (as the ultimate determinate category for relations); and the dialectic of Recognition is incorporated within the universal category of Aesthetic, as the proprietary means of all recognition (as that alone which can determine the *value* of relations according to subjectivities).

Peirce underwent a shift in his own life, as he came to understand the implications of his own insights, making a clear break from his father and his earlier thinking in which Logic was the supervenient universal category through which Ethics may be derived, and from which Aesthetics followed hierarchically, to his developing position from roughly 1867 onwards in which, following Schelling and Schiller, he recognised Aesthetic as the category of understanding from which all other categories must follow, essentially and primordially, as processes and functions of recognition and involvement. Ethics, in turn, are a function of Aesthetics, and Logic follows from Ethics. While this radical turn of thinking may have been uncomfortable for Peirce himself, repudiating the assurances he held in his younger years, his commitment to the doctrine of fallibilism led him to turn away from such assurances and to accept the full consequences of his own insights.

What is required by humanity's current ecological crisis is nothing short of a global turn of thinking no less radical, and no less prepared for the consequences of our own conclusions. We have the opportunity to become involved in our own becoming, and to recognise our reality for what it is, for what we all are. Through the insights of this thesis, we are provided with a new perspective upon ourselves within this cosmological framework, with the human conceived as actor and agent: creator, as opposed to spectator. We have made much of the theme of vision throughout this discussion, returning to the theme time and again: with Kant, Peirce, Aristotle, Uexküll, Hoffmeyer and others. We have done so also in part to highlight one of the larger metaphorical obfuscations we have inherited concerning our embodiment, and the conception of prototypical members of humanity. Our faculty of vision blinds us both to its own limitations and to the power of our other organs and capacities of receptivity and action.

An example of this may be found in the idea of precognisance or divination: the 'gift' which some people are said to have regarding foreknowledge of future states or events. Note that the preceding sentence was incredibly difficult to compose without using any of the metaphors of sight or vision that saturate our language. Almost all discussions of such ideas — fundamentally about intuition and *feeling* — rely on metaphorical reference to sight or vision: such an ability is usually called 'the sight' or 'the vision,' with indexation to visual concepts such as 'seeing' and 'scrying,' and can manifest as 'clear' or 'blurry' or 'hazy,' and even in its manifestation in other forms, such as 'reading' tea leaves or the entrails of animals, presents an inescapably visual metaphor. To understand ourselves, our *minds*, as fundamentally phenomena of embodiment, we need to 'look away' from this myopia of vision, and to accept ourselves as beings (and being) whole.

What is required by us in this case is nothing less than *to play*. We need to play more, and be less afraid of the concepts we allow ourselves to play *with*. Even if we can't *see it*, we can — and do — *feel it*, and not just with our lovely fingers, but everywhere else we know we *feel* with too. We are naturally equipped by our physiology to *feel* Nature's Aesthetic 'pour on us through every avenue of sense,' and we need to learn to once again trust our noses, and indeed our other feelings and senses. As a species, we are undeniably beset by a condition of semiotic dissonance, in which we have allowed our own prioritisation of meaning to become dissonant from the special character of semiosis which permeates the cosmos and underlies all processes of life, and processes of signification which underlie the former. We cannot shout at Nature: we have to listen and follow the music provided, and to *play* with it to find a resolution (of the music itself, as co-creators). We know instinctively when it sounds right, such is the nature of Nature's aesthetic: we can *feel it*. Our ecological predicament is dire, to be certain, but we can still fix this, with the right metaphors and ontology. In fact, the solution to all of our problems has been with us all along, as the solution *of* all of our problems, and we carry it with us always.

Namaste.

APPENDIX

The Sphinx, by Ralph Waldo Emerson

References:

Writings of C. S. Peirce

Other References

The Sphinx, by Ralph Waldo Emerson (1803-1882)

The Sphinx is drowsy,
Her wings are furled:
Her ear is heavy,
She broods on the world.
"Who'll tell me my secret,
The ages have kept?--
I awaited the seer
While they slumbered and slept:--
"The fate of the man-child,
The meaning of man;
Known fruit of the unknown;
Daedalion plan;
Out of sleeping a waking,
Out of waking a sleep;
Life death overtaking;
Deep underneath deep?

"Erect as a sunbeam,
Unspringeth the palm;
The elephant browses,
Undaunted and calm;
In beautiful motion
The thrush plies his wings;
King leaves of his covert,
Your silence he sings.

"The waves, unashamed,
In difference sweet,
Play glad with the breezes,
Old playfellows meet;
The journeying atoms,
Primordial wholes,
Firmly draw, firmly drive,
By their animate poles.

"Sea, earth, air, sound, silence,
Plant, quadruped, bird,
By one music enchanted,
One deity stirred,--
Each the other adorning,
Accompany still;
Night veileth the morning,
The vapor the hill.

"The babe by its mother
Lies bathed in joy;
Glide its hours uncounted,--
The sun is its toy;
Shines the peace of all being,
Without cloud, in its eyes;
And the sum of the world
In soft miniature lies.

"But man crouches and blushes,
Absconds and conceals;
He creepeth and peepeth,
He palters and steals;
Infirm, melancholy,
Jealous glancing around,
An oaf, an accomplice,
He poisons the ground.

"Out spoke the great mother,
Beholding his fear;--
At the sound of her accents
Cold shuddered the sphere:--
'Who, has drugged my boy's cup?
Who, has mixed my boy's bread?
Who, with sadness and madness,
Has turned my child's head?'"

I heard a poet answer
Aloud and cheerfully
"Say on, sweet Sphinx! thy dirges
Are pleasant songs to me.
Deep love lieth under
These pictures of time;
They fade in the light of
Their meaning sublime.

"The fiend that man harries
Is love of the Best;
Yawns the pit of the Dragon,
Lit by rays from the Blest.
The Lethe of Nature
Can't trance him again,
Whose soul sees the perfect,
Which his eyes seek in vain.

"To vision profounder,
Man's spirit must dive;
His aye-rolling orb
At no goal will arrive;
The heavens that now draw him
With sweetness untold,
Once found,--for new heavens
He spurneth the old.

"Pride ruined the angels,
Their shame them restores;
Lurks the joy that is sweetest
In stings of remorse.
Have I a lover
Who is noble and free?--
I would he were nobler
Than to love me.

"Eterne alternation
Now follows, now flies;
And under pain, pleasure,--
Under pleasure, pain lies.
Love works at the centre,
Heart-heaving alway;
Forth speed the strong pulses
To the borders of day.

"Dull Sphinx, Jove keep thy five wits;
Thy sight is growing blear;
Rue, myrrh and cummin for the Sphinx,
Her muddy eyes to clear!"
The old Sphinx bit her thick lip,--
Said, "Who taught thee me to name?
I am the spirit, yoke-fellow;
Of thine eye I am eyebeam.

"Thou art the unanswered question;
Couldst see thy proper eye,
Always it asketh, asketh;
And each answer is a lie.
So take thy quest through nature,
It through thousand natures ply;
Ask on, thou clothed eternity;
Time is the false reply."

Uprose the merry Sphinx,
And crouched no more in stone;
She melted into purple cloud,
She silvered in the moon;
She spired into a yellow flame;
She flowered in blossoms red;
She flowed into a foaming wave:
She stood Monadnoc's head.

Thorough a thousand voices
Spoke the universal dame;
"Who telleth one of my meanings
Is master of all I am."

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