

SPECULATIVE NATURALISM: A MANIFESTO

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‘[M]anifestos proclaim new literary movements and cultural epochs, and they trigger these movements by the very act of their proclamation. Manifestos are performative rather than descriptive speech acts; they implement what they pronounce. ... Manifestos are neither factual nor fictional – they are formative.’

Mikhail Epstein, *The Transformative Humanities: A Manifesto*

ABSTRACT: The turn to analytic philosophy in Anglophone countries, which is still underway and is spreading elsewhere, has generally involved a retreat from ‘synoptic’ thinking and an almost complete withdrawal from ‘synthetic’ thinking, the creative thinking that in the past has been the source of the greatest contributions of philosophy to science, the humanities and civilization. Analytic philosophy’s ‘naturalistic turn’ led by Willard van Ormond Quine was really a capitulation of philosophy to mainstream reductionist science. So-called ‘continental philosophy’, by abjuring naturalism, offers no real challenge to this. This paper attempts to recover a much more powerful challenge to such analytic philosophy and reductionist science, a philosophy which is naturalist but values synopsis and synthesis along with analysis: speculative naturalism. As such, this is presented as a manifesto not only for philosophy, but for science and the humanities. As Mikhail Epstein argued, the practical outcome of the humanities is the transformation of culture. To transform culture is to transform ourselves, our society and our relationship to each other and to nature.

KEYWORDS: Speculative Philosophy; Analytic Philosophy; Idealism; Naturalism; Dialectics; Schelling; C.D. Broad; Mikhail Epstein; C.S. Peirce; A.N. Whitehead.

INTRODUCTION

‘Speculative Naturalism’ distinguishes itself both from the kind of philosophy that eschews speculation and focuses on critical analysis, and from Idealism, the tradition that, reacting against the scientific revolution of the Seventeenth Century, defined nature entirely in relation to and as secondary to mind or Spirit. While the two opposing poles of philosophy, analytic versus speculative and naturalist versus Idealist, are not identical, in recent decades there has been a strong tendency to assume that they coincide. In USA the tradition of critical analysis, or analytic philosophy has

vigorously upheld naturalism, equated with scientism, the view that the methods of mainstream science can be extended to explain every aspect of reality. Philosophy that is not analytic and naturalist tends to be labelled ‘continental philosophy’, with the usually tacit assumption that ‘continental’ philosophers (many of them in Anglophone countries) are claiming to uphold intuitions or forms of enquiry and reasoning that transcend any naturalistic explanation, and in doing so, are upholding some form of Idealism. Speculative naturalism not only brings into question the correlation between these poles but rejects them as the root cause of the paralysis and marginalization of philosophy, and along with this, the entrenchment of nihilistic assumptions in the broader culture that are now paralysing communities and governments in the face of massive economic, social, political and ecological problems. Speculative naturalists are concerned to reinstate philosophy to its former pre-eminent status in intellectual life in order to challenge and overcome these nihilistic assumptions.

On the surface of it, the vagueness and even crudeness of the terms defining these poles and the difficulty of classifying all philosophers on one side or the other of these oppositions would make such strong claims and such a strong agenda highly questionable. It is possible to point to a whole range of philosophers who cannot be pigeonholed by these categories, including analytic philosophers opposed to naturalism, or at least to scientism, and the recent ‘continental’ philosophers promoting ‘speculative materialism’. However, it is not so much explicitly defended views that are the real target of this essay, although these are a major part of the problem, but tacitly held assumptions that constrain the way people think and the way debates are framed, the way disciplines, universities and research institutions are organized, and the way some philosophers have enormous influence on academics, people in power and the broader public, while others, with more profound ideas, are ignored and then forgotten. The tacitly assumed polar oppositions are manifest in the recurring debates between what C.P. Snow referred to as the two cultures, science and the humanities, Snow’s debate with Leavis echoing the earlier debate between Mathew Arnold and T.H. Huxley, which in turn resonated with debates at the time in Germany, France, Russia and Italy and the earlier critique by Goethe of Newton and of Goethe by Helmholtz. This opposition is also manifest in the opposition between orthodox and humanistic Marxism and between positivist and humanist human sciences.

The trajectory of these polar oppositions is evident in the virtual self-destruction of the humanities in Anglophone countries in the last decades of the Twentieth Century through deconstructive post-modernism, which was really a capitulation to a triumphant ‘scientism’ (the view of science defended by logical empiricists), and the collapse of career prospects for those educated in the humanities in the civil service, institutions of education, media and politics. It is also evident in the unprecedented

authority of neo-classical economists, the success of the neoliberal project of subordinating democracy to markets, promoting a new global ruling class of corporate managers, and the failure of those who have struggled to revive genuine or 'strong' democracy. To reveal what is tacitly assumed, how these oppositions have played out and why, and how these assumptions structure culture and society, it is necessary to provide an historical perspective on how these oppositions developed and co-evolved.

THE RISE OF ANALYTIC PHILOSOPHY AND THE ECLIPSE OF SPECULATIVE PHILOSOPHY

To begin with, it is necessary to look at the opposition between analytic and speculative philosophy. This opposition was characterized by C.D. Broad, a leading British philosopher whose career coincided with the eclipse of speculative philosophy, in a famous paper published in 1924, and another towards the end of his career in 1947. In the 1924 paper, Broad characterized critical philosophy, which is what we would now refer to as analytic philosophy, as analysis and clarification of the basic concepts and presuppositions of ordinary life and of science. It was assumed by its proponents that philosophical problems can be treated and dealt with in isolation from each other, and that philosophy, like science, could accumulate indubitable knowledge. On the other hand, speculative philosophers attempt to arrive at an overall conception of the nature of the universe and the position within it of human beings by taking into account the whole range of human experience—scientific, social, ethical, aesthetic, and religious. "Its business is to take over all aspects of human experience, to reflect upon them, and to try to think out a view of Reality as a whole which shall do justice to all of them", Broad wrote.¹ In his later paper, Broad characterized the methods used by such philosophers as 'analysis', 'synopsis' (i.e. 'seeing together', whereby the inconsistencies between various aspects of experience are confronted) and most importantly and uniquely, 'synthesis', which aims to 'supply a set of concepts and principles which shall cover satisfactorily all the various regions of fact which are being viewed synoptically.'² Speculative philosophy utilizes analysis, synopsis and synthesis.

Most analytic philosophers have excluded any role for synthesis and radically reduced the role accorded to synopsis in philosophy, particularly in USA. They are concerned with truth claims of sentences rather than with life and the cosmos, while often denying that there are any specifically philosophical truths. They deny validity to the forms of reasoning and experiencing associated with the claims to knowledge of

¹ C.D. Broad, 'Critical and Speculative Philosophy', *Contemporary British Philosophy: Personal Statements* (First Series), ed. J. H. Muirhead (London: G. Allen and Unwin, 1924): 77-100, p. 96.

² Professor C.D. Broad, 'Some Methods of Speculative Philosophy', *Aristotelian Society Supplement* 21, 1947: 1-32, p.22.

speculative philosophers, and of the humanities and arts generally. Analytic philosophy originated in England with G.E. Moore and Bertrand Russell, but it had its roots in Germany and Austria, particularly in the work of Gottlob Frege.³ From Austria, Germany and England it spread to USA. Centrally, it involved redefining and privileging the notion of analysis and focusing philosophy on ‘objective meaning’. While Kant had argued that synthesis is involved in both empirical knowledge (synthetic *a posteriori* knowledge) and mathematical and metaphysical knowledge (synthetic *a priori* knowledge), in characterizing the meaning relations between signs, Frege developed a philosophy that eliminated any role for mental processes, whether ideas, images or imaginative projections.⁴ Following Franz Bolzano and Rudolf Herman Lotze, he claimed that truth pertains to propositions, not concepts, and rejected Kant’s claim that arithmetic is a form of *synthetic a priori* knowledge.

While analytic philosophy has evolved since Broad wrote, throughout its history it has been characterized by an implicit respect for argument, clarity and precision that its proponents believe can only be achieved by focusing on narrow topics.⁵ It divided over the relationship between ordinary language and the language of science and the role accorded to mathematical logic and its interpretation. The later Wittgenstein, John Austin, Peter Strawson, Stanley Cavell and John Searle exemplify a tradition defending ordinary language and informal argument against mathematical logic and the concepts of science. However, the most influential analytic philosophers, particularly in USA, have privileged mathematical logic and along with this, have upheld the cognitive claims of science and its ambitions to explain everything, including all aspects of human existence. In USA philosophy itself was redefined by some of the most influential analytic philosophers as a form of science concerned with logical inference and the truth of propositions, statements or sentences.

For the leading US philosopher of the mid-twentieth century, W.V. Quine, philosophy was seen as differing from science only in degree of generality. Quine claimed that the core of philosophy is logic, and wrote of this: ‘Logic, like any science,

³ Robert Hanna in *Kant and the Foundations of Analytic Philosophy*, Oxford: Clarendon Press, 2000 argues that ‘Bolzano and Helmholtz are the advance guard of analytic philosophy ... [and] Frege is the first of its two Founding Fathers.’ (p.6). From a different perspective, see also J. Alberto Coffa, *The Semantic Tradition from Kant to Carnap: To the Vienna Station*, Cambridge: Cambridge University Press, 1991.

⁴ See Hanna, ‘The Significance of Synthetcity’, *Kant and the Foundations of Analytic Philosophy*, chap.4.

⁵ On contemporary analytic philosophy, see H.-J. Glock, *What Is Analytic Philosophy?* Cambridge University Press, 2008. Scandinavian analytic philosophers generally are far less dogmatic and far more open to different schools of philosophy. See for instance the characterization of analytic philosophy by Dagfinn Føllesdal, ‘Analytic Philosophy: What is it and Why Should one Engage in It?’ *Ratio*, 9(3, 1996): 193-208. Føllesdal defines analytic philosophy as a commitment to argument and justification as opposed to using rhetoric, and on this basis includes hermeneuticists and phenomenologists as analytic philosophers.

has as its business the pursuit of truth. What is true are certain statements; and the pursuit of truth is the endeavor to sort out the true statements from the others, which are false.’⁶ What naturalism really meant for Quine and his followers was ‘scientism’, the identification of all worthwhile knowledge with the knowledge gained by scientists. Quine defended the naturalization of epistemology, by which he meant that scientific knowledge itself could be treated as an object of scientific investigation. Quine and his disciples embraced behaviourism, epiphenomenalism or some other form of reductionist theory of mind in accordance with what they took to be respectable from a scientific point of view.

Through control of who gained academic appointments, Quine and his disciples dominated the direction of American philosophy. Their agenda was exemplified in the work of Philip Kitcher who attempted to explain naturalistically mathematics and its development, of Jaegwon Kim who continued to develop and defend a naturalized epistemology,⁷ and along with this, defended a form of epiphenomenalism, and of Quine’s student Daniel Dennett who embraced and defended Darwinian evolutionary theory, including the ideas of Richard Dawkins, and promoted a computational model of the mind and brain.⁸ Their success in imposing their agenda was summed up by Hans-Johann Glock:

In the wake of Quine, few analytic philosophers these days would dare to publish a book on the philosophy of mind, without at least professing allegiance to some form of naturalism in the preface. Thus Jackson states: ‘Most analytic philosophers describe themselves as naturalists’ Kim confines the point to the present: ‘If current analytic philosophy can be said to have a philosophical ideology, it is, unquestionably, naturalism’ And Leiter ... diagnoses a ‘naturalistic turn’ in philosophy that rivals the earlier linguistic turn in importance.⁹

And this has meant that, as Robert Hanna put, ‘all serious metaphysical, epistemological, and methodological questions in philosophy can be answered only by direct appeal to the natural sciences.’ Quine’s transformation of the analytic tradition can appropriately be dubbed the ‘scientific turn.’ After Quine ‘analytic philosophy is *scientific philosophy*.’¹⁰

⁶ W.V. Quine, *Methods of Logic*, 2nd ed. Cambridge, Mass.: Harvard University Press, 1959, xi.

⁷ Philip Kitcher, *The Nature of Mathematical Knowledge*, New York: Oxford University Press, 1984 and Jaegwon Kim “What is ‘Naturalized Epistemology’?,” *Philosophical Perspectives 2. Epistemology*, James E. Tomberlin (ed.) Atascadero: Ridgeview, 1988, pp. 381–405.

⁸ The nature and agenda of such naturalism has been described by Jack Ritchie in *Understanding Naturalism*, Stocksfield: Acumen, 2008.

⁹ Hans-Johann Glock, *What is Analytic Philosophy*, Cambridge: Cambridge University Press, 2008, p.137.

¹⁰ Hanna, *Kant and the Foundations of Analytic Philosophy*, p.10.

THE IDEALIST OPPOSITION TO ANALYTIC PHILOSOPHY

The extent to which such views dominate is evident not only in the triumph of this way of understanding philosophy in Anglophone countries but its spread to Europe in recent years, despite growing dissent from within analytic philosophy itself. It is also evident in the way those opposing this conception of philosophy usually define their views in opposition to naturalism, rejecting naturalism to affirm humanity and the human condition in all its richness and diversity as the reference point for developing philosophy. Generally, those reacting to the perceived sterility of most analytic philosophy turned to German, French, or occasionally Italian philosophers and traditions for inspiration. Hegelianism, hermeneutics, phenomenology, hermeneutic phenomenology, existentialism, critical theory, structuralism, poststructuralism and more recently Ernst Cassirer's neo-Kantianism have all been embraced as antidotes to analytic philosophy. While this has involved studying a vast range of thinkers, Kant, Hegel, Nietzsche, Husserl and Heidegger have served as the main reference points for these traditions, and it is impossible to understand Hegel, Nietzsche, Husserl or Heidegger except in relation to Kant and his second Copernican Revolution. This revolution made consciousness and the problem of knowledge the reference point for philosophy in place of being, and it was this, rather than the arguments of Berkeley, that inspired the Idealist tradition of thought.

This might appear a gross oversimplification, since Kant himself was opposed to Idealism. Certainly Hegel was an Idealist, but Frederick Beiser in an influential work on Hegel has argued that the influence of Kant on Hegel has been grossly overstated.¹¹ Nietzsche was hostile to Idealism and defended a form of naturalism. Following Brentano, Husserl, the founder of phenomenology, began by calling on philosophers to go back to Aristotle rather than back to Kant, and initially upheld a form of realism on this basis. Heidegger and those influenced by him aligned themselves with phenomenology.

However, Beiser's claims are questionable, Nietzsche's perspectivism manifests the influence on him of Kant. Husserl increasingly came under the influence of neo-Kantianism and in doing so developed phenomenology in a more Idealist direction. Michael Friedman has shown that Heidegger's turn to Husserl and then to hermeneutics was taken to overcome problems in neo-Kantianism, which was his real starting point.¹² Even the structuralism and post-structuralism of more recent French philosophy can trace its roots back to Ernst Cassirer, the most influential neo-Kantian in Germany before the rise of Naziism. Almost all continental philosophy appears to be

¹¹ Frederick Beiser, *Hegel*, New York: Routledge, 2005, p.9.

¹² Michael Friedman, *The Parting of the Ways: Carnap, Cassirer, and Heidegger*, Peru; Illinois: Open Court, 2000, p.39ff.

either neo-Kantian or post-Kantian, absorbing Kant's skeptical arguments against a facile acceptance of appearances, including appearances of nature, as reality. A strong case has been made for this by Lee Braver who argued in *A Thing of This World: A History of Continental Anti-Realism* that Kant's Copernican Revolution suffused the thought of the greatest philosophers of continental Europe, including Hegel, Nietzsche and Heidegger, up until the present, and that Kant engendered an enduring antipathy to realism, particularly scientific realism.¹³ Tacitly, this carried with it an antipathy to naturalism. A manifestation of this is that there has been an almost complete lack of engagement by the most prominent philosophers in these traditions of continental philosophy with the problem of explaining how sentient, self-conscious humans could have evolved from and within nature.

Nevertheless, these traditions were not so hostile to speculative thought, or the humanities, as analytic philosophers. Kant had attempted to arrive at apodictic knowledge of the *a priori* assumptions that are the condition for being able to organize the sensory manifold into an intelligible world, denying any place for intellectual intuition or speculation. First Fichte, and then following him, Hegel, Schleiermacher and Schelling regarded their work as speculative because they gave a place to a third kind of experience along with sensible objects and the concepts required to cognize them as such – experience of reflection on the nature and development of experience and on the generation of concepts, and on the adequacy of concepts used to interpret experience. Appreciating that concepts have changed through history, they were inspired to develop more adequate concepts. Under the influence of Greek thought, such ambitions often were combined with efforts to accord causal efficacy to Ideas. This was the post-Kantian tradition of speculative Idealism, the most notable figures philosophers are taken to be (I will argue mistakenly) Solomon Maimon, J.G. Fichte, Friedrich Schelling, G.W.F. Hegel, F.H. Jacobi and Friedrich Schleiermacher.

These German philosophers helped inspire British and American Idealism, which gave a central place to speculation and also came to be known as speculative Idealism, the most eminent proponents of which were T.H. Green and F.H. Bradley in Britain and Josiah Royce in USA.¹⁴ Speculative Idealism came to be identified with a coherence theory of truth and a view of reality as an organism comprising a Self, Mind or Spiritual principle. These Idealists were seen by their opponents as the epigone of the German speculative Idealists. The British Idealists in particular were the target of the early analytic philosophers in Britain, who often characterized their own position as

¹³ Lee Braver, *A Thing of This World: A History of Continental Anti-Realism*, Evanston: Northwestern University Press, 2007.

¹⁴ On the British Idealists, see W.J. Mander, *British Idealism: A History*, Oxford: Oxford University Press, 2011, esp. chap. 4 'The Metaphysics of the Absolute.'

a defense of realism against Idealism. Consequently, there has been a strong tendency by analytic philosophers to identify speculative philosophy with speculative Idealism, a contamination of Anglophone philosophy by continental traditions, and then to define this as the ultimate polar opposite of first the realism, and then later, particularly in USA, the naturalism upheld by analytic philosophers.

Again, it is not only the diverse views expressed that are important here, views which for the purpose of this argument I have greatly simplified, but the unexpressed and institutionalized tendency to categorize philosophers on one side or the other of this divide and to be blind to or to misinterpret views that do not fit into one or the other of these opposing sides. The tendency to categorize philosophy as either analytic or continental, and then as either naturalistic (often equated with materialist) or speculative Idealist, and to conflate these two oppositions, has had the effect of blinding people to, or at least facilitating the marginalization of, a tradition that is naturalistic, humanistic and speculative at the same time, a far more potent opposition to the creeping dominance of analytic philosophers claiming a monopoly on naturalism and the prestige of associating with science and mathematics.

RECOVERING THE TRADITION OF SPECULATIVE NATURALISM

This blindness is evident in the misinterpretation of major philosophers and a failure to acknowledge their achievements and influence. The most blatant misrepresentation of a major philosopher, a philosopher who should be recognized as a founder and one of the most important figures in the tradition of speculative naturalism, is Schelling. As noted, Schelling is generally categorized as an Idealist. Schelling figures prominently as an Idealist in a recent major work on the history of German philosophy by one of the leading American historians of German philosophy, Frederick Beiser, titled *German Idealism*. Yet in his *System of Transcendental Idealism* devoted to deducing categories to grasp the whole of reality, Schelling clearly states that transcendental philosophy, which takes the subjective as primary, is only one part of philosophy, the other being nature-philosophy (*Naturphilosophie*) which takes the objective as primary. For nature-philosophy,

The concept of *nature* does not entail that there should also be an intelligence that is aware of it. Nature, it seems, would exist, even if there were nothing that was aware of it. Hence the problem can also be formulated *thus*: how does intelligence come to be added to nature, or how does nature come to be presented?¹⁵

What is important to note here is that this is not a repudiation of Kant's Copernican revolution, but a second (or third) Copernican revolution by which the transcendental

¹⁵ Schelling, *System of Transcendental Idealism*, [1800], 1978, p.5.

is naturalized. Schelling radicalized Kant and Fichte by pointing out that the condition for the possibility of science is that nature must be conceived such that it can and has generated conscious beings that can understand how they have been generated within nature, and how they have become conscious of themselves as participants in nature. Nature has become conscious of itself through them. This is speculative naturalism.

Soon after, in *Universal Deduction of the Dynamical Processes* where he attempted a ‘dynamic construction of matter’, Schelling argued that the Philosophy of Nature is more fundamental than Idealism,¹⁶ and in the third version of *The Ages of the World* written circa 1815 he characterized Idealism as the philosophy of people who had dissociated themselves from the forces that are the basis of their existence and become ‘nothing but images, just dreams of shadows’.¹⁷ It was in his *First Outline of a System of the Philosophy of Nature* (published in 1799) that Schelling defended speculation as ‘Speculative Physics’. Rather than just accepting the concepts of Newtonian science, Schelling argued that these have to be revealed, questioned and transcended to make intelligible the emergence of life and humanity. Many years later, circa 1835, lecturing on the history of modern philosophy, Schelling argued that his philosophy transcended the opposition between materialism and spiritualism, realism and Idealism (Schelling, 1994, 120). In his 1842 lectures in which he set out to attack Hegel’s Idealism, Schelling clarified the difference between naturalism and Idealism that has defined the difference between Idealism and speculative naturalism ever since. While Hegel had argued that Being is the most empty concept, Schelling argued that philosophers must accept that there is an unprethinkable being (*unvordenkliche Sein*) that precedes all thought, including scientific and philosophical thought.

Another instance illustrating how the dualistic categorization of philosophy leads misrepresentations is the misinterpretation of R.G. Collingwood. A major opponent of analytic philosophy, Collingwood is almost always portrayed as an Idealist. However, he himself pointed out that his own views had been misrepresented because only two philosophical positions were recognized, realism (defended for the most part by analytic philosophers) and Idealism. As he wrote in his autobiography, ‘any one opposing the

¹⁶ F. Schelling, “Allgemeine Deduktion des dynamischen Processes oder der Kategorien der Physik”, (F.W.J. Schelling, *Sämmtliche Werke*, (SW) ed. K.F.A. Schelling I Abtheilung vols 1-10, II Abtheilung vols 1-4, Stuttgart: Cotta, 1856-61, I/4:1-78).

¹⁷ Schelling, *System of Transcendental Idealism* (1800), 5 (*SW* I/3:338-40), and F.W.J. Schelling, *The Ages of the World, Third Version* (c.1815), trans. Jason W. Wirth (New York: State University of New York Press, 2000), 106; (*SW* I/8:343/342). On the prioritizing of the Philosophy of Nature, see Beiser, *German Idealism*, 489. In 1809 Schelling argued that idealism is inadequate for characterizing human freedom, being only capable of a formal conception, not “not the real and vital conception of freedom ... that ... is a possibility of good and evil.” *Schelling: Of Human Freedom*, trans. James Gutmann (Chicago: Open Court, 1936), 26; (*SW* I/7:352).

“realists” was automatically classified as an “idealist”, which meant a belated survivor of Green’s school.’¹⁸ Reviving the tradition of Greek philosophy, Collingwood developed a logic of question and answer, which itself is an aspect of dialectical thinking. As developed by Collingwood, this became an important method for exposing hierarchies of assumptions to reveal the ultimate metaphysical assumptions of an era. Collingwood is most well known as a philosopher of history and as an historian, but he also wrote on the Idea of Nature, essentially a history of the philosophy of nature, and offered his own speculative philosophy of nature very much in the Schellingian tradition.¹⁹

Many other philosophers have been similarly mis-categorized. Schelling’s Nature Philosophy had an enormous influence on other philosophers, who have also tended to be misinterpreted. C.S. Peirce, for instance, who is usually classified with the pragmatists defined by their support for the pragmatist theory of truth, wrote to William James: ‘My views were probably influenced by Schelling ... by all stages of Schelling, but especially by the *Philosophie der Natur*. I consider Schelling enormous ... If you were to call my philosophy Schellingianism transformed in the light of modern physics, I should not take it hard.’²⁰ While philosophers paid attention to Peirce’s work in logic and epistemology, until recently his speculative cosmology was not taken seriously. Like Schelling, Peirce was a speculative naturalist concerned to conceive physical existence in a way that would enable humans to be understood as products of and creative participants in nature, with metaphysics, aesthetics and ethics accorded a place in his philosophy along with logic and science. This was also true of other philosophers categorized as pragmatists, including John Dewey and George Herbert Mead. Friedrich Engels, Henri Bergson, Aleksandr Bogdanov (the founder of ‘tektology’) and Alfred North Whitehead were also indirectly influenced by Schelling and each has advanced the tradition of speculative naturalism.

SPECULATIVE THINKING AS DIALECTICS

This schematic history of the background to the development of speculative naturalism is designed to provide some idea of what it entails preliminary to defending it. The defense of speculation was in response to the perceived limitations of Kant’s transcendental deductions and his proscription of intellectual intuition whereby people could gain knowledge of the development of cognition while, unlike the anti-Kantians,

¹⁸ R.G. Collingwood, *An Autobiography*, Oxford: Clarendon Press, 1939, p56.

¹⁹ See Guido Vanheeswijck, ‘R.G. Collingwood and A.N. Whitehead on Metaphysics, History, and Cosmology’, *Process Studies* 27/3-4, Fall-Winter, 1998: 215-236.

²⁰ Letter dated January 28th, 1894, quoted by Joseph L. Esposito, *Schelling’s Idealism and Philosophy of Nature*, Lewisburg: Bucknell University Press, 1977, 203;

accepting the value of Kant's arguments that experience is organized by imagination and concepts. Speculation, by which not only the development of cognition and (for Schelling) nature could be comprehended, but old concepts could be questioned and new conceptual framework elaborated, was given a place through the revival of dialectics, although there were differences in how dialectics was understood. Fichte and Schelling gave more place to imagination, construction and will than Hegel, whose *Logic* was seen to be a geometrization of the dialectic. This work illustrated the direction an Idealist dialectic could take. The most sustained effort to characterize dialectics explicitly was Friedrich Schleiermacher's lectures on philosophy, published as *Dialectic or, The Art of Doing Philosophy*, where he explicitly relates dialectic to speculation.²¹ What is clear from this work is the complexity of dialectics compared to the characterization of reasoning by mainstream analytic philosophers, and how Schleiermacher anticipated conceptions of rationality developed by the post-positivist philosophers of science. Schelling's dialectics, practiced rather than explicitly defended, is even more open than Schleiermacher's, and particularly in his later work, highlights the difference between an Idealist dialectic and the dialectical thinking of a naturalist.

Recognizing the unprethinkable Being preceding all thinking undermines the basis for assuming that the quest for comprehensive understanding of the whole can ever be finally successful, although it is still necessary to strive for this. Enquiry is not seen as a patchwork of empirical investigations that can be later collected together and systematically organized into a coherent logical structure for convenience, but assumes its goal to be an integral, coherent comprehension of the whole. There are no absolute starting points or foundations for knowledge in this quest, either in experience or in reason, and no conclusions that are beyond further questioning, although the received view of what the goal of enquiry is can be taken as a foundation of sorts.²² The characterization of knowledge can only emerge through competing claims to knowledge in which prevailing assumptions about what is knowledge have been challenged by proposing alternatives. It also involves appreciating that current arguments, including arguments over what is knowledge, take place in the context of traditions of thought and inquiry formed by a history of questioning, investigating, experimenting, searching for evidence, discussing and arguing. To participate in these traditions requires an appreciation of their past achievements and failures, what

²¹ As Schleiermacher put it, 'mathematics is more closely allied to the empirical form, dialectic more allied to the speculative form. ... [S]peculative natural science can be set forth only according to dialectical principles...' Friedrich Schleiermacher, *Dialectic or, The Art of Doing Philosophy*, trans. Terrance N. Tice, Atlanta: Scholars Press, 1996, p.73.

²² This is an unusual way of characterizing a foundation, but this has been defended through an exegesis of the work of Aristotle and Aquinas by Alasdair MacIntyre in *First Principles, Final Ends and Contemporary Philosophical Issues*, Milwaukee: Marquette University Press, 1990.

tradition or traditions are dominant in the present, why they are dominant, and what is the ultimate goal of enquiry. It is for this reason that the history of philosophy and of civilization has always been central to the work of dialectical thinkers. Not only is it part of the quest for comprehensive understanding of nature and humanity, but only by providing a schematic history that philosophers can define and situate their own work in relation to the evolving traditions of philosophy, civilization, humanity and the rest of the nature and defend their work. Only in relation to such schematic (synoptic) history could their own work be justified as superior to what had been achieved in the past.

While Collingwood, Peirce and Whitehead are not usually considered as dialecticians, I think it is evident when their work is examined in the context of the development of dialectical thinking, they have made major contributions to understanding and developing dialectical thought. Collingwood's question and answer logic is clearly a clarification of what is centrally involved in dialectical thinking. Peirce's categories of Firstness, Secondness and Thirdness are clearly influenced by Hegelian dialectics,²³ but at the same time they make it easier to appreciate Schelling's argument for unprethinkable being. This can be seen as Firstness, the condition for all else. Through these categories Peirce developed his theory of semiotics, categorized logic in terms of semiotics, and showed that induction and deduction do not exhaust reasoning; reasoning in all domains of inquiry requires also abduction, which is really speculation. Speculative reasoning is not exhausted by mathematics and symbolic logic, however important these are, and requires the use of 'real vagues', terms which are not and might never be precisely defined.

However, it was Whitehead who did most to clarify the goal of speculative philosophy and what is involved in developing radically new ways of thinking, new ideas and new language to express these.²⁴

Whitehead defined this goal in *Process and Reality*:

²³ See Charles Sanders Peirce, *Pragmatism as a Principle and Method of Right Thinking: The 1903 Harvard Lectures on Pragmatism*, ed. Patricia Ann Turrisi, New York: SUNY Press, 1997, p.120. In the unpublished MS. 190 Peirce argued against dialectics, but this appears to be directed at Hegel's *Logic*. Joseph I. Esposito who discusses this argument in *Evolutionary Metaphysics: The Development of Peirce's Theory of Categories*, Athens: Ohio University Press, 1980, p.31ff. also notes in his preface to this book 'From his earliest work Peirce's thought had tended toward the direction of a dialectical view of reality and experience.' (p.5).

²⁴ See Alfred North Whitehead, *The Function of Reason*, Princeton: Princeton University Press, 1929. For an exposition of Whitehead's notion of speculative metaphysics and how it differs from Russell's metaphilosophy, see Arran Gare, 'Speculative Metaphysics and the Future of Philosophy: The Contemporary Relevance of Whitehead's Defence of Speculative Metaphysics', *Australasian Journal of Philosophy*, 77 (2), June, 1999, pp.127-145. See also, Johan Siebers, *The Method Of Speculative Philosophy: An Essay on the Foundation of Whitehead's Metaphysics*, Kassel: Kassel University Press, 2002.

Speculative Philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted. By this notion of 'interpretation' I mean that everything of which we are conscious, as enjoyed, perceived, willed, or thought, shall have the character of a particular instance of the general scheme. Thus the philosophical scheme should be coherent, logical, and in respect of interpretation, applicable and adequate. Here 'applicable' means that some items of experience are thus interpretable, and 'adequate' means that there are no items incapable of such interpretation.²⁵

Whitehead makes it clear that this involves more than analysis when he argues that: 'Philosophy is the search for premises. It is not deduction. Such deductions as occur are for the purpose of testing the starting points by the evidence of the conclusions.'²⁶ Nor can they be found through induction. Whitehead also argued that before correlations between observations can be of importance, it is first necessary to have schemes of ideas into which such observations can be fitted. These schemes precede systematic observation, and can be of the greatest significance even when they fail to achieve contact with observation. Rationality, in its basic form, is neither deduction nor induction, but the search for principles or schemes of ideas. How can this search be conducted? To begin with, Whitehead argued that there cannot be a method for this, since it is only through such schemes of ideas that methods are established. As he put it: 'The speculative Reason is in its essence untrammelled by method. Its function is to pierce into the general reasons beyond limited reasons, to understand all methods as coordinated in a nature of things only to be grasped by transcending all method.'²⁷ However, he qualified this, arguing that there is a method of sorts involved in reaching beyond set bounds, including all existing methods. It was this 'method' which was discovered by the Greeks, and why we now talk of speculative reason rather than inspiration. This cannot be understood as the application of a rigid formula. There cannot be a fixed, definite procedure of speculative reason such as that of deductive logic. What then is speculative reason? And in particular, How does speculation operate in philosophy? Essentially, speculative reason is, in Pierce's terminology, abduction, the development of a working hypothesis to elucidate experience. Such working hypotheses are arrived at through the generalization of patterns experienced in particular domains. Although Whitehead seldom uses the terms, this is a matter of

²⁵ Alfred North Whitehead, *Process and Reality* [1929], Ed. David Ray Griffin and Donald W. Sherburne, N.Y.: Free Press, 1978, p.3.

²⁶ Alfred North Whitehead, *Modes of Thought*, N.Y.: Free Press, 1938, p.105.

²⁷ Alfred North Whitehead, *The Function of Reason*, Princeton: Princeton University Press, 1929, p.51.

elaborating analogies or metaphors. What is required to elaborate these the 'free play of the imagination, controlled by the requirements of coherence and logic.'²⁸

ANALYTIC PHILOSOPHY, SPECULATIVE NATURALISM, AND SCIENCE

Once the tradition of speculative naturalism is recognized, it is possible to judge it in relation to the naturalism of mainstream analytic philosophy. As noted, for the most part, analytic philosophers simply misrecognize and ignore speculative naturalists, and since they assume that careful analysis will produce indubitable arguments that can be added to the bucket of scientific knowledge, there has been very little engagement between these two traditions, despite the close relationship between Russell and Whitehead. There is one major exception, however, the work of Murray Code who has contrasted Peirce and Whitehead on the one hand with Russell and Quine on the other, and in a more recent work, revealing the deficiencies in Philip Kitcher's effort develop a naturalistic philosophy of mathematics.²⁹ In response to Kitcher's work, Code, formerly a mathematician, argued that an adequate naturalism requires the insights of Peirce and Whitehead with their much fuller account of experience and rationality, not only giving a place to feeling, imagination and intuition in mathematics but requiring speculative theories of nature to give a place to these along with what can be comprehended through mathematics.³⁰ However, analytic philosophers committed to scientism have redefined philosophy and rationality so as to absolve themselves from even engaging with, let alone taking seriously such arguments. Code's work has been ignored.

The real point at issue between analytic philosophers and speculative naturalists is the identification by analytic philosophers of naturalism with scientism. By identifying naturalism with the view of reality and ambitions of mainstream science, these analytic philosophers have ruled out any questioning of the assumptions of science or any challenge to science from different realms of experience. They not only have accepted, but defended the state of our culture where, as Whitehead complained: 'Philosophy has ceased to claim its proper generality, and natural science is content with the narrow round of its methods.'³¹ In doing so, they have ignored Whitehead's argument that:

No science can be more secure than the unconscious metaphysics which tacitly it presupposes. The individual thing is necessarily a modification of its environment,

²⁸ Whitehead, *Process and Reality*, p.5.

²⁹ See Murray Code, *Myths of Reason: Vagueness, Rationality and the Lure of Logic*, New Jersey: Humanities Press, 1995.

³⁰ Murray Code, 'Mathematical Naturalism and the Powers of Symbolisms', *Cosmos & History: The Journal of Natural and Social Philosophy*, 1(1), 2005: 35-53. See also his 'On the Poverty of Scientism, or: The Ineluctable Roughness of Rationality', *Metaphilosophy*, 28(1&2): 102-122.

³¹ Whitehead, *The Function of Reason*, p.50.

and cannot be understood in disjunction. All reasoning, apart from some metaphysical reference, is vicious. Thus the Certainties of Science are a delusion. They are hedged around with unexplored limitations. Our handling of scientific doctrines is controlled by the diffused metaphysical concepts of our epoch. Even so, we are continually led into errors of expectation. Also, whenever some new mode of observational experience is obtained the old doctrines crumble into a fog of inaccuracies.³²

This has had a destructive effect on science as well as philosophy and the humanities, as scientists now ignore the works of philosophers. As the theoretical physicist Carlo Rovelli complained, after noting that ‘for thirty years we have failed. There hasn’t been a major success in theoretical physics in the last few decades’:

The divorce between this strict dialogue between philosophers and sciences is very recent, in the second half of the 20th century. ... There is narrow-mindedness, if I may say so, in many of my colleagues who don’t want to learn what’s being said in the philosophy of science. There is also a narrow-mindedness in a lot of the areas of philosophy and the humanities, whose proponents don’t want to learn about science, which is even more narrow-minded.³³

Essentially, by identifying naturalism with mainstream science these philosophers have locked in the basic assumptions about nature assumed by reductionist scientists against not only the humanities, and thereby greatly contributed to undermining the humanities, but against the most creative areas in the natural sciences. In doing so, they are not only crippling philosophy but undermining science.

It is this state of things where scientists are looking to philosophers for new insights and finding sycophants defending outmoded scientific ideas that has rendered analytic philosophy vulnerable to the challenge of speculative naturalists. What is not properly appreciated except by historians of science is just how important speculative philosophy has been to science. The influence on science of Schelling and the tradition of speculative naturalism he inspired is a major case in point.³⁴ In challenging Newtonian physics, Schelling conjectured that a new physics would be developed based on a conception of physical existence as productivity with products emerging through opposed forces, uniting the study of light, electricity and magnetism. Based on this new physics, chemicals and life would be understood as either passive (in the case of chemicals) or actively maintained (in the case of life) balances of opposed forces. Those

³² Whitehead, *Adventures of Ideas*, p.154.

³³ Carlo Rovelli, ‘Science Is Not About Certainty’, in *The Universe*, ed. John Brockman, New York: Harper Perennial, 2014, p.215, 227 & 228.

³⁴ See Arran Gare, ‘Overcoming the Newtonian paradigm: The unfinished project of theoretical biology from a Schellingian perspective’, *Progress in Biophysics and Molecular Biology*, 113, 2013: 5-24.

influenced by Schelling succeeded in this project. His work contributed to the development of field theory. The whole of chemistry is based on the notion of valency and consequent balances between opposed forces. His work also inspired the postulation of the first law of thermodynamics, and he put forward a form of systems theory and anticipated the development of cybernetics and hierarchy theory.³⁵ Schelling also developed ideas on mathematics, again radicalizing Kant, that influenced Justus and Hermann Grassmann.³⁶ Hermann Grassmann was not only the forefather of vector and tensor algebra central to modern physics, but anticipated the development of category theory, one of the most active fields of current mathematics.³⁷

Schelling also had a major influence on other philosophers who also had an influence on science and mathematics, notably C.S. Peirce, Henri Bergson and Alfred North Whitehead. While the logic and set theory beloved by analytic philosophers is proving increasingly irrelevant to understanding advances in contemporary mathematics, mathematicians attempting to provide a synthetic theory of mathematics adequate to this task have turned back to Peirce's philosophy to provide this.³⁸ Bergson and Whitehead were a major influence on Ilya Prigogine's work on non-linear thermodynamics. The claim by Ilya Prigogine and Isabelle Stengers that the study of dissipative structures generated in far from equilibrium systems heralded a new alliance between science and the humanities should be treated as a proclamation of the triumph of Schellingian speculative naturalism over Newtonian science. Whitehead's ideas have also been a major influence on physics and post-reductionist biology, most importantly, the work of C.H. Waddington.³⁹ Peirce's ideas have also been taken up and developed by bio- and eco-semioticians,⁴⁰ while the quantum physicist Brian Josephson has

³⁵ See Arran Gare, 'From Kant to Schelling to Process Metaphysics: On the Way to Ecological Civilization', *Cosmos & History*, 7(2) 2011: 26-69.

³⁶ See Michael Otte, 'Justus and Hermann Grassmann: philosophy and mathematics', *From Past to Future: Grassmann's Work in Context* Ed. Hans-Joachim Petsche et.al. Basel: Springer, 2011, pp.61-70..

³⁷ As F. William Lawvere acknowledged in 'Grassmann's Dialectics and Category Theory', *Hermann Günther Grassmann (1809-1977): Visionary Mathematician, Scientist and Neohumanist Scholar*, Boston Studies in the Philosophy of Science, Ed. Gert Schubring, Dordrecht: Kluwer, 1996.

³⁸ See Fernando Zalamea, *Synthetic Philosophy of Contemporary Mathematics*, Trans. Zachary Luke Fraser, New York: Orchard Street, 2012, chap.3.

³⁹ See Timothy E. Eastman and Hank Keeton, eds. *Physics and Whitehead: Quantum, Process, and Experience*, N.Y.: State University of N.Y. Press, 2004 and Brian G. Henning and Adam C. Scarfe, eds, *Beyond Mechanism: Putting Life Back into Biology*, Lanham: Lexington Books, 2013.

⁴⁰ See Claus Emmeche and Kalevi Kull eds, *Towards a Semiotic Biology: Life is the Action of Signs*, London: Imperial College Press, 2011.

invoked Peirce's work on semiotics to interpret quantum theory.⁴¹ Speculative naturalism is now flourishing among the most original scientists struggling to overcome the deficiencies of mainstream physics and comprehend the complexity of life.⁴²

In short, in refusing to subordinate philosophy to science or to be overawed by past achievements of science, being prepared to question the foundations and assumptions of mainstream science and to elaborate radically new ways of thinking about nature, speculative naturalists, unlike analytic philosophers, have had and continue to have a profound and creative influence on science. While analytic philosophers are champions of 'normal' science, speculative naturalists have been and are essential to 'revolutionary' science. Not only have analytic philosophers failed to contribute to science, their promotion of scientism and their fawning attitude towards scientists and mathematicians has failed to impress their idols. Gian-Carlo Rota, a leading scientist in post-WWII USA, friend of John von Neumann and Stanislaw Ulam and a professor of applied mathematics and philosophy at MIT, wrote in 'The Pernicious Influence of Mathematics Upon Philosophy':

The fake philosophical terminology of mathematical logic has misled philosophers into believing that mathematical logic deals with the truth in the philosophical sense. But this is a mistake. ... The snobbish symbol-dropping found nowadays in philosophical papers raises eyebrows among mathematicians, like someone paying his grocery bill with Monopoly money.⁴³

To fill the vacuum created by academic philosophers abrogating their responsibilities, leading scientists and mathematicians are extending their work into philosophy and taking up and contributing to the tradition of speculative naturalism. David Bohm, Ilya Prigogine and Robert Rosen towards the end of the Twentieth Century and Howard Pattee, Stan Salthe, Mae-Wan Ho, Jesper Hoffmeyer, Kalevi Kull, Stuart Kauffman, Henry Stapp, Lee Smolin and Robert Ulanowicz in the present are obvious examples of this, but this is nothing new. C.S. Peirce and Alfred North Whitehead were originally mathematicians and scientists before becoming philosophers.

SPECULATIVE NATURALISM, THE HUMANITIES AND THE HUMAN SCIENCES

To evaluate speculative naturalism on the basis of its superior contributions to science and mathematics alone would be to miss the full significance of speculative naturalism, however. As Broad noted, the goal of speculative philosophy is to take into account the

⁴¹ Brian D. Josephson, 'Biological Observer-Participation and Wheeler's "Law without Law"', *Integral Biomathics: Tracing the Road to Reality*, ed. Plamen L. Simeonov, Leslie S. Smith and Andrée C. Ehresmann, Heidelberg: Springer, 2013, pp.253-258.

⁴² See the essays in *Integral Biomathics: Tracing the Road to Reality*.

⁴³ Gian-Carlo Rota, *Indiscrete Thoughts*, Boston: Birkhauser, 1996, p.93.

whole range of human experience—scientific, social, ethical, aesthetic, and religious and to develop a conception of reality that does justice to all of these. Speculative naturalism, in contrast to the naturalism of analytic philosophers, is not only an affirmation of the ambitions of philosophy in the grand manner against any tendency to dissolve philosophy into apologetics for mainstream science; it is an affirmation of the cognitive claims and significance of the humanities. The most illuminating way to comprehend what this means is to consider the work of a recent defender of the humanities, Mikhail Epstein.

Epstein offers not only a defense and guidance for reviving the humanities, but more importantly, a crucial clarification of what the humanities are and what role they should play. Succinctly:

The crucial distinction between the humanities and the sciences is that in the humanities the subject and the object of study coincide; in the humanities, humans are studied by humans and for humans. Therefore, to study the human being also means to create humanness itself; every act of the description of the human is, by the same token, an event of one's self construction. In a wholly practical sense, the humanities create the human, as human beings are transformed by the study of literature, art, languages, history and philosophy: the humanities humanize.⁴⁴

Humans create themselves by creating 'new images, signs and concepts of themselves ... humans do not so much discover something in the world of objects as build their very subjectivity by way of self-description and self-projection.'⁴⁵ Alluding to the way metamathematics and the theory of computation founder on problems of self-reference, Epstein notes that 'the natural sciences are most interested in what makes the humanities "less scientific", their subject-object reversibility, for example, their semantic fuzziness, and even the metaphoric nature of their language. The natural sciences cannot strive for the pinnacle of self-organized and self-reflective knowledge without the humanities' critical contribution.'⁴⁶ It is by virtue of this critical contribution that the humanities are not merely a supplement to science, but must lead it. As Epstein noted, 'the humanities used to determine, and give meaning to historic eras. The era of Enlightenment was inaugurated by philosophy and literature..., the era of Romanticism came into being thanks to the creative efforts of literary critics, linguists, poets and writers.... It has traditionally been the role of the humanities to lead humankind.'⁴⁷

⁴⁴ Mikhail Epstein, *The Transformative Humanities: A Manifesto*, New York: Bloomsbury, 2012, p.7.

⁴⁵ *Ibid.* p.8.

⁴⁶ *Ibid.* p.8f.

⁴⁷ *Ibid.* p.12.

Why should this be so? Epstein points out that the natural sciences are concerned with nature, and the practical extension of science is technology through which we transform nature. The human sciences study society, and their practical extension is politics through which society is transformed. The humanities focus on culture, and the practical extension of this is the transformation of culture. It is through the transformation of culture that we create ourselves as human. However, the natural sciences and the capacity to transform nature and the human sciences and the political power bequeathed by the social sciences to transform society are each part of culture. The natural scientist and the social scientist are themselves formations and products of culture. The whole project of understanding nature in order to transform it was launched by Francis Bacon, and it was the philosopher William Whewell in the nineteenth century who coined the term 'scientist'. The role of the scientist was created by the humanities. The study of nature and society by the natural and social sciences are not only projects to comprehend these to facilitate their transformation; they are part of a humanities inspired project to define and form our relationship to nature and society. It is through the humanities that the nature and goal of science is defined. On the basis of this conception of the humanities and its role, Epstein endorsed Whitehead's proclamation that 'the task of a University is the creation of the future, so far as rational thought, and civilized modes of appreciation, can affect the issue.'⁴⁸

The problem we now face, as many philosophers have recognized, is that the main forms of natural science are committing to explaining away not only consciousness but also life as mere appearances. There is no place for human subjects able to create themselves, and no place for the humanities that assume there is. Implicitly, mainstream reductionist scientists are committed to reducing nature and people to predictable instruments, and they believe that they have been and will continue to be successful at this. The naturalism of analytic philosophers inspired by Quine provides strong support for such a view. Do we still need the humanities? Do we need to cultivate humanity and produce humans willing to take responsibility for creating the future? Could we not accept what has been bequeathed to us by the humanities from the past and allow only forms of science that treat nature and people as only of significance insofar as they can be transformed to serve the economy and the quest of companies and governments to maximize profitability and GNP to be funded?

Subjectivities will still be formed by the mind control industries of advertising and public relations, supplemented by psychiatrists, psychologists, sociologists and criminologists dealing with intransigent cases. The market as a self-regulating mechanism being imposed throughout the world to define all human relationships

⁴⁸ Ibid. p.15, quoted from Alfred North Whitehead, *Modes of Thought*, New York: Free Press, 1938, p.233.

provides all the feedback needed to generate economic progress. Science integrated and identified with technological research no longer requires people inspired by the quest for truth, even the very limited notion of truth upheld by Quine. Science graduates can be controlled like all other employees by human resource managers trained to extract the maximum output of profitable products for minimal inputs. The contradiction between a form of science that makes the very existence of science and scientists unintelligible can be ignored because scientists can now be treated as instruments for producing profitable technology, not heroic figures striving for true understanding of nature. Essentially, this is the agenda of neoliberalism.

Is this new form of science delivering? While there have been some technological advances, the picture of science that is emerging in institutions where scientists who have given up the quest for truth and replaced it with the quest for publications and research grants is a noise explosion. Bruce Charlton, a medical researcher, recently published a book *Not Even Trying: The Corruption of Real Science*, decrying the current state of scientific research. He compared it to a factory in Poland before the collapse of communism: 'The factory was producing vast quantities of defective drinking glasses *which nobody wanted*. Nobody wanted to even use them. So the glasses were simply piling-up in gigantic stacks around the factory building – using-up resources, getting in everybody's way, and taking-up all the useful space.'⁴⁹ Charlton suggested that science now is so bad it would be better to pay researchers to do nothing than to continue with what they are doing. This is the natural sciences.

The human sciences are worse because what is produced is positively destructive. This is clearly the case with mainstream economics which has flourished because it provides ideological support for the neoliberal agenda, despite work of philosophers of science exposing its superficial resemblance to physics being a sham based on a misunderstanding of the conditions for deploying its mathematical models.⁵⁰ Exponents of complexity theory such as Brian Arthur and Paul Ormerod, who do understand the role mathematics can and should play in science, have shown that economic systems generally do not have a tendency to move to equilibrium but are characterized by 'increasing returns' and catastrophes, undermining the basis for claiming that markets are an efficient means of allocating resources. Unconstrained markets can be expected to concentrate wealth and thereby power in regions, countries, corporations and individuals until they cripple the economy and society. After the global financial crisis

⁴⁹ Bruce G. Charlton, *Not Even Trying: The Corruption of Real Science*, Buckingham: University of Buckingham Press, 2012, p.14. Evidence in support of this claim is provided by Philip Mirowski in *Science-Mart: Privatising American Science*, Cambridge: Harvard University Press, 2011.

⁵⁰ This was demonstrated by Philip Mirowski in *More Heat than Light: Economics as Social Physics, Physics as Nature's Economics*, Cambridge University Press, 1989 and a series of other books.

brought about by the policies promoted by these economists, providing empirical evidence verifying theoretical criticisms of neo-classical economics, neo-classical economists continued dominating government economic policies, despite alternatives offered by the theoretically more defensible tradition of institutionalist economics.⁵¹ It is clear that with success in the market displacing the quest for truth as the criteria for determining research,⁵² ideas that augment the power of the powerful dominate no matter what the consequences. As for psychology and sociology, the vast majority of what purports to be scientific research in these subjects now bears very little resemblance to science.

It appears that this neoliberal agenda has locked humanity into a trajectory that is concentrating wealth and power in the hands of a new global ruling class based in corporations, undermining democracy and paralysing efforts to deal with a global ecological crisis.⁵³ Unconstrained markets do not provide the feedback necessary to generate appropriate responses to ecological destruction, and often accelerates ecologically destructive economic activity. Freed from control of public institutions upholding notions of truth and justice and a public committed to the common good, the market is no more self-regulating in the twenty first century than it was in the nineteenth and early twentieth centuries. Marxists who believe that the collapse of global capitalism will automatically liberate humanity have learnt nothing from the outcome of the Great Depression or the collapse of the Soviet Union. The revival of the humanities will be required to save civilization, as has always been the case.

This leads to the crucial and central concern of speculative naturalism running from Schelling to present day speculative naturalists: if the cognitive claims of the humanities are accepted, nature must be conceived in such a way that humans as aware, conscious, creative social subjects can have evolved within it. Reductionist science and the reductionist forms of explanation it has privileged must be wrong and should be replaced. Nature itself must be seen as creative, generative of emergent levels

⁵¹ See *Zombie Economics: How Dead Ideas Still Walk Amongst Us: A Chilling Tale* by John Quiggin, Princeton: Princeton University Press, 2010 and Philip Mirowski, *Never Let a Serious Crisis go to Waste*, London: Verso, 2013. For an alternative set of policies based on the tradition of historical, institutionalist economics, see Erik S. Reiner ed., *Globalization, Economic Development and Inequality: An Alternative Perspective*, Cheltenham: Edgar Elgar, 2004.

⁵² See Philip Mirowski, *Science-Mart: Privatising American Science*, Cambridge: Harvard University Press, 2011 for a description of how this has taken place.

⁵³ See Dmitry Orlov, *The Five Stages of Collapse: Survivor's Toolkit*, Gabriola Island: New Society, 2013. The black humor with which this book is written should not blind readers to the profundity of Orlov's observations. Much the same conclusions are reached in the anthology *The Politics of Empire: Globalisation in Crisis* edited by Alan Freeman and Boris Kagarlitsky, London: Pluto Press, 2004, published before the global financial crisis.

of organization not reducible to the conditions of their emergence. Ecology, which brings all this into focus, was and remains very much an anti-reductionist science engendered by, influenced by and reciprocally influencing the tradition of speculative naturalism.⁵⁴ Recognizing that humans emerged from and are participants in ecosystems involves recognizing their potential for both creativity and destruction, and focuses attention on the conditions for the continued survival of humanity and civilization. It is hardly surprising, therefore, that speculative naturalists were among the early environmentalists and have been at the forefront of environmentalism up to the present, and at the forefront of efforts to address the global ecological crisis.

SPECULATIVE NATURALISM AND THE CREATION OF THE FUTURE

The development of the natural sciences on more defensible foundations provided by speculative naturalism, making science consistent with the reality of humans and their potential for understanding and creativity, is not only in the service of the pursuit of truth, however. It should be seen at the same time as a development of the humanities, involving a transformation of culture which should then transform humanity's relation to the rest of nature. In place of the dictum that a thing is right when it tends to increase the profitability of transnational corporations, and is wrong when it tends otherwise, speculative naturalism supports Aldo Leopold's dictum that: 'A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise.'⁵⁵ If the practical outcome of the sciences is technology, this science will lead to a different way of understanding technology, seeing it not as subduing nature to make it into a totally predictable instrument of the human will, but as augmenting the conditions for the flourishing of ecosystems, including the global ecosystem, of which humanity is a part.

The alliance of post-reductionist science and the humanities effected through speculative naturalism has equally profound implications for the human sciences. The humanities preceded the development of the human sciences, which were often developed to oppose the humanities. This was followed by a counter-reaction to develop forms of human science supporting the humanities. This dialectic clarifies what is at stake, the significance of the broader opposition between science and the humanities and of the speculative naturalist quest to overcome this opposition. The humanities were developed in Renaissance Italy at a time when the liberty of its republics was under threat as a revival of the kind of education deemed necessary by

⁵⁴ See Robert E. Ulanowicz, *Ecology: The Ascendent Perspective*, New York: Columbia University Press, 1997, esp. p.6 and *A Third Window*, West Conshocken, Templeton Foundation Press, 2006, esp. chap.6.

⁵⁵ Aldo Leopold, *A Sand County Almanac And Sketches Here and There*, London: Oxford University Press, 1949, p.224f.

Cicero, under the influence of the Greek idea of *paideia*, to produce citizens able to govern themselves and defend the liberty of the republic. The rise of the mechanistic world-view was part of the counter-renaissance, a movement of thought in France and Britain opposed to republicanism and its ideas of liberty as self-governance.⁵⁶ As a major figure in this counter-renaissance, Hobbes sought to characterize humans in a way that would render the civic humanist notion of liberty unintelligible, in reaction to which Giambattista Vico defended a new science upholding the humanities. This defense was continued by Johann Herder, the first person to develop the concept of culture in its modern sense. While Renaissance economics had focused on the conditions for fostering the development of people and their arts,⁵⁷ Adam Smith's economics influenced by Hobbes, Locke and Newton fostered possessive individualism while the historical school, influenced by Herder, kept alive the Renaissance tradition.

What is at issue in the opposition between mainstream human sciences and the humanities and humanistic human sciences is whether people are to be studied in order to justify their subordination and to work out how to control them, or whether they are to be studied to reveal the conditions for the full development of their highest potential for liberty to govern themselves and to inspire them to strive for this liberty. This opposition runs through all the human sciences: economics (where classical and neo-classical economics continue the tradition deriving from Hobbes, Locke and Smith, while institutionalist economics has its roots in the historical school), psychology, sociology and geography, and it runs through the opposition between orthodox Marxism (the form of Marxism that led Marx to write that if there is one thing that he knew, it was that he was not a Marxist) and humanist Marxism. In the opposition between these, the anti-humanists have always promoted themselves as 'scientific', attacking, undermining and debunking the 'comforting illusions' of the humanists.

Speculative naturalism and the developments in science that it has inspired changes all this. It is the humanistic human sciences and humanistic psychology, along with the humanities generally, that through the influence of speculative naturalists are now finding support in the sciences. At the same time, however, speculative naturalism requires a radical rethinking of these humanistic approaches, since they now need to uphold this humanism while simultaneously seeing humans as part of and as participating within nature. Institutional economics is now provided with support, but there is also an expectation that this be developed as institutional ecological economics.⁵⁸ Humanistic approaches in politics, sociology and geography, usually

⁵⁶ This has been shown in a number of the works of Quentin Skinner.

⁵⁷ See Erik S. Reinert, *How Rich Countries Got Rich ... And Why Poor Countries Stay Poor*, New York: Carrol & Graf, 2007, chap. 2.

⁵⁸ As exemplified by Arild Vatn, *Institutions and the Environment*, Cheltenham: Edward Elgar, 2005.

associated with hermeneutics, symbolic interactionism, phenomenology and humanistic Marxism also find support in such science, but there is also an expectation that these be developed as part of human ecology with human semiosis associated with culture understood as contributing to the semiosphere of the global ecosystem.⁵⁹ And in all cases, there is an expectation that these disciplines conceive what they are studying as historical and evolving.

If, as Epstein argued, the practical extension of the social sciences is the transformation of society through politics, then the goal of such transformation, the way that such transformation is conceived and how it is implemented by speculative naturalists will be fundamentally different than that of mainstream ‘scientific’ social science. Transformation will not involve controlling people so that they function as instruments of those with power, but inspiring people to create the natural and social forms, the built-up environments and institutions, that will augment their humanity and their capacity to augment the natural and social conditions for life and humanity. It will be a politics of ‘eco-poiesis’.⁶⁰ Creating humans, this will involve developing and living out narratives, but not monologic narratives. It will involve the development of dialogic or polyphonic narratives that allow for diverse voices of participants to question and participate in revising and reformulating the stories they are living out, with stories themselves understood as components of the global semiosphere. They will be made responsible for their culture and its reformulation, a reformulation in which speculative naturalism will create new subjectivities, subjectivities committed to addressing and overcoming the threats civilization and humanity now face from ecological destruction. These are the subjectivities that will create a new era, the era the Chinese environmentalists have called for and dubbed ‘ecological civilization’.

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⁵⁹ On the semiosphere, see Jesper Hoffmeyer, *Signs of Meaning in the Universe*, trans. Barbara J. Haveland, Bloomington: Indiana University Press, 1993, chap.5. See also Arran Gare, ‘Philosophical Anthropology, Ethics and Political Philosophy in an Age of Impending Catastrophe’, *Cosmos & History*, Vol. 5(2), 2009: 264-286. On developments in human ecology, see Dieter Steiner and Markus Nauser eds, *Human Ecology: Fragments of anti-fragmentary views of the world*, London: Routledge, 2003.

⁶⁰ See Arran Gare, ‘Toward an Ecological Civilization: The Science, Ethics, and Politics of Eco-Poiesis’, *Process Studies*, 39(1), 2010: 5-38.