Whitehead, Field Being and Panpsychism

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Introduction

Alfred North Whitehead is, of course, best known has a process philosopher who regarded entities as temporary emergents from fields of dynamic relations. He referred to entities as 'concresences'[1] which emerged as prehensions[2] from a form of self-organization in fields of processes. Concresences persist for a while as 'subject-superjects,'[3] which thrust their own energy, valuation and creativity forward in an intended direction, bringing about the next state of the physical space. [4]

Whitehead's connections to Field Being Philosophy are apparent in the systems of interrelated dynamic fields that provide the bedrock for Whitehead's notion of a physical space. As in Daoism, wherein a thing's *de* is partly autonomous but very much circumscribed by the surrounding *Dao,* and functions as a complement to the *Dao,*[5] so too, a Whiteheadian concresence is a temporarily autonomous, but situationally rooted semi-autonomous thing.

[1] Alfred North Whitehead, *Process and Reality*, eds. David Ray Griffin and Donald W. Sherburne, corrected edition, Free Press, NY 1978, p.24
[2] Alfred North Whitehead, *Process and Reality*, eds. David Ray Griffin and Donald W. Sherburne, corrected edition, Free Press, NY 1978, p.19
[3] ibid. p. 29
[4] ibid.p. 19
[5] Thomas Michael, *The Pristine Dao,* SUNY Press, 2005, p. 19

Whitehead's panpsychism is apparent in the intentional and valuational status of his subject-superjects. Whitehead describes the primordial nature of God as present through valuation and intention in the concrescent objects in the world.

> This is the 'primordial nature' of God. By reason of this complete valuation, the objectification of God in each derivate actual entity results in a gradation of the relevance of eternal objects to the concresent phases of that derivate occasion.[6]

While philosophers such as Philip Clayton[7] refer to Whitehead's position as Panentheism rather than panpsychism, I will use the broader and less-specific term, panpsychism, to avoid theological implications. What is very clear of Whitehead's subject-superjects, is that they are not mechanical dead matter, as the physical world has been predominantly regarded by science since Isaac Newton rejected Aristotle's formal and final causes in his formulation of the mechanical laws of physics.

This paper will compare three aspects of the field relations and panpsychism in Whitehead with some contemporary physics. First, the paper will compare Whitehead's notion of eternal ideas with two neo-Platonic approaches to contemporary physics: Max Tegmark's and Lisa Randall's. Next, the paper will analyze notions of self-organization in physics, comparing those notions to Whitehead's emergents. Finally, the paper will argue, with Whitehead, that consciousness must be everywhere to emerge anywhere, and so must occur in degrees throughout nature.

1.Universal Ideas: Platonism in Whitehead and Physics

[6]*Process and Reality*, p.31
[7] Philip Clayton, *God and Contemporary Science*, Grand Rapids: Wm. B. Eerdman's, 1998.,

For Whitehead, God's consequent nature is "The presupposed actuality of conceptual operation….which is unchanged by reason of its final completeness.[8] In Whitehead, universal Ideas are Ideas in the eternal nature of God, which set restraints on what is possible, both in nature, and more broadly in Platonic heaven. In a sense he considers them mere abstractions, which, because they are lacking in feeling, are defective. He refers to propositional reasoning as "impure intellectual cogitations"[9] Yet, the role of God's ideas in establishing possibilities is also clear for Whitehead. Whitehead's Platonism also shows in his contribution to the *Principia Mathematica,*[10] which established the basis for Freges' notion of a "third realm"[11]. So, for Whitehead, mathematics and other Platonic ideas are useful for making hypotheses to be checked, against experience, or fleshed out through contact with actual occasions.

Max Tegmark argues for what he calls the Mathematical Universe Hypothesis, (MUH) which, he claims, explains both the surprising accuracy and usefulness of math in understanding the nature of the world, and the recurring shapes and patterns that are summarized in the Laws of Physics.[12] Mathematical structures are the sets of abstract entities that can be explained exclusively in terms of the relations among them. So reality is essentially relational, and the relations featured most prominently are the mathematical relations of equivalence, symmetry and computability among structures. [13] Tegmark claims that some of the key physical entities in physics have no intrinsic properties, but only mathematical ones, citing empty space,

[8] *Process and Reality,* p. 345
[9] ibid. p.34
[10] Alfred North Whitehead and Bertrand Russell, *Principia Mathematica*, Cambridge University Press, 1910
[11] Gottlob Frege, "Sense and Reference" *The Philosophical Review,* Vol. 57, No. 3 (May, 1948), pp. 209-230

[12] Max Tegmark, *Our Mathematical Universe*, Alfred A. Knopf, New York, 2014, p.254
[13] ibid, p. 267

elementary particles and the wave function as examples.[14] He concludes that the Universe is a mathematical structure, from which composite objects are emergent from equations involving only more fundamental [i.e. mathematical] objects.[15]

Tegmark's and Whitehead's Platonic tendencies are also argued for by Lisa Randall, who points out that mathematical equations are often discovered before the physical phenomena that they represent so accurately. Randall reports:

> ….Paul Dirac first discovered anti-matter mathematically, in 1927 when he tried to find the equation that described the electron. The only equation that he could write down consistently with the known symmetry principles implied the existence of a particle with the same mass and opposite charge, a particle that no one had seen before. Dirac racked his brain before capitulating to the equation and admitting that this mysterious particle had to exist. Carl Anderson discovered the particle in 1932, verifying Dirac's assertion that "The equation was smarter than I was." [16]

Einstein also conceded that he should have capitulated to the equations, after he made the mistake of arguing that there must have been something wrong with his own calculations in the EPR paper.[17] The Einstein Podalsky Rosen paper argued that the formalism of quantum mechanics had to be incomplete. Bell's inequalities demonstrated that this was not true, and Einstein had to recant the EPR paper.[18]

These considerations about mathematics and universal ideas support a form of Mathematical Formalism. All of reality consists of structures, and the structures are top-down in nature, if not in epistemological discovery. The structures, thus impose constraints on what

[14] ibid, p. 271
[15] ibid, p.257
[16] Lisa Randall, Knocking on Heaven's Door, Harper Collin's Publishers, New York, 2011, p. 99
[17] Einstein, A., Podolsky, B., and Rosen, N. (1935): Can Quantum Mechanical Description of Physical Reality be Considered Complete?, Physical Review 47 777.
[18] Bell, J. S. (1964): On the Einstein–Podolsky–Rosen paradox, Physics 1 195 (reprinted in Bell 1987).

physical things can be or do. But these formalist arguments also point out that there is a clear relationship between human ability to comprehend abstract forms, and the nature of the structures of reality themselves. As Whitehead required of reality, claiming that it must be a form in which everything fits with everything else.

Lisa Randall calls her form of mathematical formalism 'model building' and she argues, actually more like Whitehead than like Tegmark, that there is a dynamic relationship between her use of models to probe reality, and the response of experimental results to her models, during the process of doing scientific research. Randall states:

> Model Building helps us to recognize the possibilities, suggest experimental searches, and interpret data once they are available. We might be lucky and get it right. But model building also gives us insights into what to look for. Even if no particular models' predictions turn out to be completely correct, they will help us deduce the implications of any new experimental results. The results will distinguish among the many ideas and determine which, if any, of the specific implementations correctly describes reality. If no current proposal works, data will nonetheless help to determine what the right model might be.[19]

These universal and mathematical ideas, in Whitehead, in Tegmark and in Randall all indicate that the Universe has a structure; a rational organic structure, that can be known by humans, sometimes, in outline at least, in advance of empirical research. This formalism rejects the compositional brick-by brick view of what science learns and how it learns it, espoused by, say Daniel Dennett, in favor of a more unified and organic notion of reality. Both Tegmark and Randall also concur with Whitehead's view of reality as relational, and as dynamic. Next I will look at some views of reality as self-generating.

2. Self-Organization and Emergent Phenomena

[19] Knocking on Heaven's Door, p. 341

Lisa Randall describes a soufflé as an emergent phenomena. The final concoction depends on the underlying components for its final form, but its final form could not have been predicted from any of the ingredients.[20] Music, likewise, requires oscillating molecules in the air, but is not reducible to them. Life and consciousness, she also argues, depend on the underlying chemical and physical properties, of brains, however, advances in the study of consciousness will require not only neuroscientists, but also psychologists [21][and philosophers?]. Randall claims that the material view is essential but not necessarily sufficient in understanding all of the phenomena in our world.

Whitehead considered the rudiments of self-organization present in every aspect of physical reality, promoting the production of emergent phenomena. Gregoire Nicolis explains how this works in ordinary physical systems,

> Such ordinary systems as a layer of fluid or a mixture of chemical products can generate, under appropriate conditions, a multitude of self-organizing phenomena on a macroscopic scale – a scale orders of magnitude larger than the range of fundamental interactions- in the form of spatial patterns or temporal rhythms. … Non-linear dynamics and the presence of constraints maintaining the system far from equilibrium will turn out to be the basic mechanisms involved in the emergence of these phenomena. [22]

Nichols points out that convection in thermodynamics, the formation of chemical turbulence and wave fronts in vats of chemicals, oceans or weather systems, and chemotaxis and morphogenesis in biological systems, as well as statistically modeled behaviors of human populations, all exhibit certain properties in common. What is happening when these

[20] ibid. p. 52
[21] ibid. p. 53
[22] 23 Gregoire Nicolis, "Physics of Far-From-Equilibrium Systems and Self-Organization", in The New Physics, ed. Paul Davies, Cambridge University Press, 1989 p. 316

processes take place is something is acting as an attractor other than equilibrium (which is a universal or default attractor for systems). So, symmetry is broken, and the system must make an historical 'choice' among attractors, resulting in a bifurcation of histories for the system.[23]

Many such types of phenomena self organize and produce emergents in nature. From coils of boiling water forming in a boiling pot, through hurricanes, and Lisa Randall's examples of a soufflé and music, these events are not merely static interactions among pre-ordained entities, but represent dynamic field relations which take place when an array of appropriate events are occurring in the same place at the same time.

At quantum levels of physics, self-organization is a more ubiquitous and law-like occurrence. Abner Shimony argues for a Whiteheadian interpretation of action at a distance as a way of understanding the puzzles raised by the Bell inqualities:

> . Shimony points out that the two-particle system can be seen as having a web-like relationship involving the two photons, and the actualities and potentialities of both of them, rather than as being independent entities. If this position is taken, the photons would form a Whiteheadian network of events in contrast with a metaphysics of individuals of the type that Strawson advocated.[24]

Symmetry breaking is necessary to head a system in a new direction, at the quantum level as well as at more macro levels of physics. As long as a system remains completely symmetrical, nothing new happens. But when a level of instability is introduced, different types of events may emerge.

[23] ibid. p. 330

[24] Abner Shimony, "Metaphysical Problems in the Foundations of Quantum Mechanics", in The Philosophy of Science, ed. Richard Boyd, Philip Gasper, and J.D. Trout, (Cambridge, MA: Bradford Books, MIT Press, 1993), p. 525

Symmetry breaking is also suggested as a solution to the puzzle that different sets of laws seem to operate at different scales in reality. There are significant and difficult to explain gaps between how the universe works at the scales of quarks, of atoms, of molecules, of objects, of planetary systems, and of the universe as a whole. And all such Laws break down at the Planck scale.[25] Lisa Randall suggests that symmetry breaking may be the key to these huge leaps that nature takes between scales. [26] As many physicists say, understanding the very small is essential to understanding the very large, and understanding the cosmos is essential to understanding the sub-atomic particles.

These scientists and philosophers do not use Whitehead's vocabulary of prehensions- subjects and superjects- emerging within fields of processes, but it seems to me that they are not on a far distant track from his. There is something intentional, even if mechanical about processes as basic as symmetry breaking and self-organization. There is also something inherently creative about the new entities and events emerging from these processes. It does not seem unreasonable to me to hypothesize that these elements might contain the rudiments of what might emerge in humans as consciousness. At the minimum, they are a reflection of the rationality of the universal ideas embedded in the physical processes, as Whitehead had observed. There appears to be a resonance among the universal ideas, the nature of physical reality and the practices of exploring scientists that makes the reflection of one on the other a fruitful enterprise.

3. Rational Universe, Rational Processes, Rational Minds

[25] Knocking at Heaven's Door, pgs. 70-91
[26] ibid, 296-299

As the comments about self-organization and emergence in the last section indicated, there are at least two sources of rational coherence in the universe which must in some sense resonate with one another for contemporary physicists to be succeeding to the degree that they are in their discoveries of nature. There must be Platonic universal ideas present both in nature and in human thinking, in some manner, and there must also be self-organizing creativity present in both the world and in human thinking. We see the platonic universals in the constraints on model building that scientists can do, and we see the resonance of human minds with empirical processes in the fact that the models often send research in appropriate directions, and the models can be corrected by empirical data. So, what of the matter, the entities and data of empirical research? Might they turn out to be the dead, passive mechanisms of Newtonian physics?

Well… yes and no. Yes, there are mechanical relations that can describe their behavior in terms of predictable equations. But also, no, because the mechanical relations do not recognize that material entities also function as emergents within dynamic fields, engage in self-organization and move the physical world in new directions. All of nature is organic and self-organizing from the level of quarks, through atoms, molecules, proteins, and DNA, into organic systems, eco-systems, planetary systems, solar systems, and galaxies, back to anti-matter, and dark and light energy, which, in turn, become the particles and anti-particles that become inchohate at the Planck scale.

Rational order, emergence and creation of newness occur at every level, although they may not be apparent to a mechanical micro-analysis of a part of a system. Life and consciousness may be especially unique manifestations of the capacity of nature to produce

self-reflective creative rationality. But the potential must be in matter, as in the rest of the universe, or life and consciousness would not have emerged. The organic unity of all of nature, even if it is a multiverse, renders it all a self-organizing collection of fields. The universe must be a panpsychic phenomena, in a least a minimalist sense, at every level, which becomes self conscious and rational at the human level and universally [Platonically] rational and coherent at the cosmic level.

Roger Trigg has also argued that the ancient Greek presupposition that the universe is rational and that rational minds are capable of apprehending it is frustrated by modern scientism, which he defines as the presupposition that nature consists exclusively of dead mechanical matter that compiles only in accordance with additive principles compounding from the bottom up.[27] Trigg argues that in addition to rejecting the Aristotelian formal and final causes, the materialist mechanists of the Enlightenment also rejected the Enlightenment notion that science was possible and fruitful because it was a process of studying the mind of God embodied in the material world, and because human reason was a reflection of the Mind of God.[28] Without these hypothesized resonances among Platonic Heaven, Human minds and the laws of nature, it is actually a mystery how or why humans would expect the difficult research required for science to succeed. It certainly isn't apparent from empirical observation of nature that human models of the type used by Randall are more likely than fairy tales to lead to true analyses of the inherent properties of the physical world. The faith to persevere in this type of enterprise presupposes that there are facts about the nature of reality and that humans and

[27] Roger Trigg, *Philosophy Matters,* Blackwell Publishers, Oxford, UK 2002, p. 37-38
[28] ibid. p. 37

our mathematical models are capable of probing reality in ways that will lead to apprehending those facts.

So, Whitehead was correct, at least in the way he framed the situation if not in the details of how it operates at every scale. Consciousness and rationality, at least in a bare minimal form, must be ever where if they are to function anywhere.