

# Process Philosophy and the Critique of Critical Realism

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10<sup>th</sup> Anniversary Conference of the Association for Heterodox Economists  
Anglia Ruskin University, Cambridge

## ***Introduction***

In a recent paper, Julie Nelson (2003) argues that the Institutional, Pragmatist, and Process Philosophy traditions have been neglected both by orthodox theorists and, surprisingly perhaps, by certain of their heterodox antagonists. Despite this neglect, process philosophy has found enthusiastic supporters amongst natural scientists and philosophers of science such as Prigogine (1997) and, from a Post-Structuralist perspective, Deleuze and Guattari (1994).

In his response to feminist critics of an earlier paper (Lawson, 1999), published in the *Feminist Economics* journal, Tony Lawson (2003)—Convenor of the Cambridge Social Ontology Group—has returned to the question of what Critical Realism as an economic methodology could contribute to feminism critiques of orthodox economics. Few of the feminist respondents were convinced by Lawson’s earlier arguments that their interests would be best served by espousing a Critical Realist ontology in debating with orthodoxy. In particular, Julie Nelson (2003: 115) argued that Alfred North Whitehead’s organicist ontology “locates the knower *within* reality and (through a broader, deeper, and more serious understanding of *experience*) sees the knower as having a sense of the whole and the many (or in more current lingo, the “other”) as well as of the self.” Lawson (2003) responded to Nelson’s arguments with a five page counter-response, which incorporated a six page appendix on the similarities and differences between Process Philosophy and Critical Realism.

This paper concurs with Nelson’s arguments about the methodological value of process philosophy. It proceeds by examining how Whitehead’s interpretations of induction and probabilistic inference came to influence Keynes during the drafting of *The General Theory*. While Whitehead’s endorsement of the philosophy of organism mirrored the views of Frank Ramsey and G. E. Moore, it is argued that Whitehead went further than the latter authors, insofar as he felt compelled to construct a rigorous justification for probabilistic inference in an organicist world where, otherwise, everything would simply depend on everything else. To this end, he espoused the notion of an hierarchical ontology.

In the paper, Whitehead’s notion of a hierarchical ontology is evaluated against its Critical Realist counterpart: the three-layered ontology proposed by Bhaskar and other proponents of Critical Realism such as Tony Lawson. The paper counters Lawson’s complaints about Whitehead’s apparently excessive rationalism, his *a priorism*, and his penchant for dualistic thinking. Instead, it is argued that Whitehead’s Process Philosophy

affords more scope for a pluralist approach to economics insofar as it supports a more comprehensive methodological and an ethical critique of orthodox economics.

### ***The Nature of Lawson's Response***

Nelson wholeheartedly “accepts the case for ontology” but holds to the view that “Whitehead’s conception offers more” than its Critical Realist counterpart. For Lawson (2003), Nelson’s (2003) central complaint is that his own approach is too rationalistic, “overemphasizing reason, abstraction, and formal logic” and privileging these faculties over emotion and what can only be “vaguely known”. She further complains that Lawson’s “subject-attribute” language promotes a dualism between subject and object, and the knower and the known. Because this gap between the knower and the known cannot be bridged, Nelson suggests that Lawson “seeks to assert the existence of objects (mechanisms) outside experience” through “arguments for their logical necessity”.

Lawson’s (2003) response to this criticism is initially to argue against the notion that Critical Realism imposes *a priori* assertions. Instead he claims that it starts “generalized features of experience and theorize[s] their conditions of possibility” with a view to developing the most powerful explanation for the structure of reality (Lawson, 2003: 132). Far from predicating arguments on logical necessity, Lawson (2003: 133) contends that Critical Realism advances “speculative hypotheses to be compared with others so derived in terms of their explanatory power”. Thus Critical Realism, for Lawson, is predicated on *a posteriori* findings, internal to, and motivated by experience rather than logical necessity. Its starting point is to direct attention to the far from ubiquitous phenomena of event regularities, which are then grasped through the isolation of the underlying stable mechanisms responsible for their causal determination: an isolation that is accomplished through experimental closure.

In respect of these considerations, Lawson claims a kinship with the objectives of Whitehead’s process theory. However, he goes on to argue (Lawson, 2003: 134) that Whitehead, himself, accepts the “*a priori* restriction that all aspects of reality conform to the principles of mathematical logic”. Moreover, after asserting that Nelson’s privileged features: “Feelings! Emotions! Influence! Connection! Holism! Vagueness! Process! Value!” also “figure centrally in Critical Realism”, Lawson (2003: 135) directs readers to his appendix for a discussion of how the two projects diverge, not least in regard to the meaning conveyed by these categories within each of the respective ontologies.

To begin with, Lawson establishes his Hegelian credentials by suggesting that the application of dialectical forms of reasoning may be required to analyze processes “of becoming, of tendencies and countervailing tendencies, or of conflict, transformation, and emergence”, which relinquish the “so-called laws of identity, of non-contradiction and of the excluded middle”.

While acknowledging Whitehead’s acceptance that creative imagination has a bearing on ontology, Lawson complains that his speculative philosophy effectively relies on “the play of free imagination controlled by the requirements of coherence and logic” (Lawson,

2003: 140; citing Whitehead, 1978: 5). He further observes that, for Whitehead, Logic also prescribes the shapes of metaphysical thought, while philosophy entails the “elaboration of categorical schemes”. Quoting from *Science and the Modern World*, Lawson goes on to suggest that Whitehead’s conception of the theory of organicism is “developed to conform broadly with, or to generalize, the abstract structure of physical field theory”.

Through a judicious choice of quotes, Lawson traces the broad outlines of Whitehead’s ontology noting that it is “atomistic and actualistic” in its concern for “actual entities” that are instantaneous, so that human beings are necessarily a society or nexus of such entities. He notes that an actual entity can be analyzed in terms of its modes of functioning (or prehensions), which can be decomposed into both active subjects and the objects of their special activity in accordance with the subjective form (of the given prehension)<sup>1</sup>. He then introduces Whitehead’s other ontological types: the eternal objects, recognizing that these are “a bit like Platonic forms” insofar as they represent the immortal side of the World of Value, thus contrasting with actual entities, which represent the World of Change. Actualities, however, exemplify eternal objects as potentialities, which ingress into temporal events providing them with form and subsistence.

To overcome the resulting dualism between actual entities and eternal objects, Lawson contends that Whitehead is compelled to introduce a mediator—the divine element—which enables eternal objects and actual entities to conform to one another in the conjunction of an ideal realization. However, he complains that this merely shifts the problem because Whitehead’s God is thus rendered dualistic insofar as it is deemed to possess both a primordial nature (mental, static, and transcendental) and a consequent nature (physical and dynamic).

Lawson (2003: 148, fn. 14, 15) relies heavily on John Dewey’s critique of Whitehead’s process philosophy. To support his own claim of excessive rationalism he quotes Dewey’s (1941: 658) complaint that the entire strain of thought in Whitehead’s (1942) *Adventure of Ideas* “substitutes abstract logical connectedness for the concrete existential temporal connectedness”. The *coup de grace* is administered by Lawson in the shape of a complaint that Whitehead’s notion of feeling is less an emotional state and more a technical term for the subjective form in which objects are prehended by the subject. Thus, he concludes that “the emphasis on feeling and emotion in Whitehead is misleading”. Lawson draws on a final Whitehead quote cited in Dewey’s essay to the effect that “physical energy is an abstraction from the complex energy, *emotional and purposeful*, inherent in the subjective form of the *final* synthesis in which each occasion completes itself”—to add further weight to his conclusion.

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<sup>1</sup> “Prehensions” are concrete modes of analysis of the world. To prehend is to have a concrete idea or concept of that thing. However, a prehension is also a process of appropriation of an element of, or one derived from, an actual entity that changes the internal constitution of the prehending subject. Additionally, it is the process through which the prehending subject, through a series of appropriations, becomes itself. This becoming thus obtains through a concrescence of prehensions. Accordingly, prehensions are physical or mental representations of actual entities. However, objects of prehension may include eternal objects, propositions, and the nexus of relations established between conceptual objects.

## **Counter Critique**

On face value it would seem that Lawson has carried through his critique in an effective and devastating fashion. He has apparently shown that Whitehead's thinking is characterized by an excessive rationalism, an *a priorism*, and a profound dualism. Accordingly, each of these claims is countered in the following subsections of the paper.

### **Excessive Rationality**

This section of the paper argues that Lawson's complaint of an excessive rationalism stands in sharp contrast to the central purpose of Whitehead's metaphysical endeavours: the desire to overcome what he calls the "bifurcation of nature" between 'what is apprehended' on one hand (i.e. from the perspective of the natural sciences; in other words nature as physical, inert, and mechanical) and what functions as "the cause of apprehension" on the other hand (i.e. from the perspective of living experience; or nature as poetic and meaningful). Whitehead achieves this resolution through the development of a process philosophy constituted on organicist principles.

Whitehead's (1978: 23) 'principle of process' states that, "*how* an actual entity *becomes* constitutes *what* an actual entity is." While an atomistic ontology conceives of the essential characteristics of things as those of the individual and views relations that such entities have with other entities as purely external in nature, in contrast, an organicist ontology holds to the view that the essential properties of things are determined by internal relations they establish with other things.

Whitehead (1978) is never rigid in his approach to metaphysics, noting that "Metaphysical categories are not dogmatic statements of the obvious", rather, "they are tentative formulations of the ultimate generalities". Significantly, Lawson quotes Whitehead to the effect that "Rationalism is an adventure in the clarification of thought", yet this very quote ends with the phrase "progressive and never final", in which "even partial success has importance."

In his efforts to explain the meaning of Whitehead's "adventure in the clarification of thought", Bruno Latour (2004: 205) observes that Whitehead draws from William James the principle: "to have a body is to learn to be affected". As an interface the body becomes more describable as it learns to be affected by more and more elements. Latour latches on the example of odour kits that are used to train 'noses' for the perfume industry. This training in recognition of an array of different fragrances enables the trainee to inhabit a rich world of differentiated scents and odours that were previously merged together into a far smaller number of ill-defined contrasting smells. This kind of genetic constructivism should be contrasted both with more fashionable and idealistic versions of social constructivism and with naïve versions of empiricism that construe language (i.e. "odour kits") as a merely passive intermediary dissolving once meaningful connections have been established between the autonomous subject and the external world (Latour, 2004: 208). Applying his example to the bifurcation of nature, Latour

cautions that the temptation for the philosopher of science is to establish accuracy or veracity by distinguishing between two accounts of odour. On one hand, there is the scientific world of chemicals, pheromones, chromatographs, and neuro-transmitters, a world of primary qualities, on the other hand, there is the derived world of secondary qualities existing only in the imagination of the all too human observer. Thus, the phenomenological body offering something “more” than chemistry is split from the physiological body of scientific investigation.

Whitehead argues that the act of becoming itself should not be conceived in a temporal sense: that is, concrescence is not temporal succession; rather, each phase of a genetic process (and each feeling in each phase) presupposes the entire quantum. This is because the product of the genetic process is temporal extension but not concrescence itself. As such, it expresses the indivisible unity of an “all or nothing” outcome. His justification for this principle, which he terms the Epochal Theory of Time, is set out in terms of a rigorous logic of non-contradiction. In proving this Theory Whitehead (1978: 105, 434) relies on a version of Zeno’s paradox, which entails the premises: a) that in becoming something becomes, b) that every act of becoming is divisible into earlier and later sections, themselves acts of becoming; c) hence nothing can become since any act presupposes earlier phases of becoming etc. Accordingly, Whitehead recommends a rejection of the second premise, replacing it with the principle that, “in every act of becoming there is the becoming of something with temporal extension; but that the act itself is not extensive”. He further suggests that his frequent resort to temporal terms to describe concrescence is largely due to inadequacies of language. Many authors have pointed to the consistency of Whitehead’s Epochal Theory of Time with De Broglie’s quantum physical conception of the Block universe. It also has analogies with Spinoza’s notion of what is grasped when we conceive of things under a certain species of eternity.

An actual entity is at once a subject experiencing (the dynamic aspect), and a superject of its experiences (the static aspect). It also possesses a self-regulatory aspect. The superject is the final synthesis of what Whitehead calls the process of concrescence, through which ‘prehensions’ are integrated into a fully determined feeling or satisfaction (Whitehead, 1978: 66, 71). Actual entities may be classed as primary (a class that includes both actual entities and pure potentials) or hybrid (including feelings and propositions) (Whitehead, 1978: 134-36). For Whitehead, the subject denotes the private aspect of concrescence. For Whitehead, a superject is more than a mere multiplicity (1978: 43, 71), insofar as it is characterized by “over-summativity” (1978: 140), a property which obtains whenever the introduction of a new element changes the definite quality of the actual entity. The superject achieves wholeness by realizing an ‘eternal object’, however, the latter is only expressed (immanently) in and through an actual entity. Accordingly, for Whitehead, every particular is universal through objectification insofar as it becomes a constituent in the constitution of any one actual entity (Whitehead, 1978: 76, 224). While it attains immortality in contributing to prehending occasions, its immediate existence is annihilated (Whitehead, 1978: 97, 321).

He describes ‘subjects’ as they are ‘commonly understood’ by the term “persons” (1978: 238-254). A human person is a serially ordered society (i.e. a series of actual entities).

Whitehead was opposed to the “subjectivist principle,” which posits a substantialist concept of personhood. A person cannot be a “first substance” in the Aristotelian sense of the term, because substances can neither inhere within, nor be predicated of other substances. The subject, then, is radically relational, insofar as all actual things are subjects, with each prehending the universe from which it arises and actively shaping itself around its given environmental conditions. Whitehead conceives of the body as a complex structured hierarchy integrated by personal society as its dominant member. Whitehead now relies on another propositional argument to resolve what he calls the Problem of Identity, which relates to the fact that personal identity must be secured. The components of his argument are: a) that a person is either serially ordered or not ( $P \vee \sim P$ ); b) if the former applies, then the person cannot introduce novelty ( $P \rightarrow \sim N$ ); c) if the latter, then the person has no identity ( $\sim P \rightarrow I$ ); d) therefore, either no novelty is allowed or no identity can arise ( $\therefore \sim N \vee \sim R$ ); e) hence, Whitehead is obliged to construct the notion of a living personal society. He argues that ‘propositions’ loosen the grip of immediate past, producing novelty through acting as a “lure for feeling” (Whitehead, 1978: 37, 130). In accordance with the lure of the proposition, enduring objects objectify their own past “with peculiar completeness in our immediate presence” (Whitehead, 1978: 151-167). Accordingly, the old pattern, with which identity is associated, can be preserved without loss within a new unity.

However, this frequent resort to rigorous forms of rational argumentation on Whitehead’s part must be situated within a broader epistemic context. Related to Whitehead’s notion of bifurcation, is a fundamental distinction he makes between visceral and visual modes of perception. Actual entities can become objects of prehension for other actual entities in two ways: either by ‘presentational’ objectification (where an eternal object is indirectly perceived as a result of a direct perception of an actual entity), or by a ‘causal’ objectification (whereby an eternal object is directly perceived as an expression of the formal nature on the objectified actual entity). Each form of objectification is correlated with a mode of perception, respectively ‘causal efficacy’ (a direct perception of prior actual occasions which are causally related or relevant to a subsequent actual occasion), and ‘presentational immediacy’ (a direct perception of present actual occasions, which may lead to a process of integration with actual occasions in the past). The presented locus is the ground for each of these modes of perception acting as the unifying principle for physical and mental operations (Whitehead, 1978: 189-95). The presented locus is perceived directly by presentational immediacy and indirectly by causal efficacy.

The distinction between visual and visceral modes of perception is introduced so that Whitehead can question the Humean dogma that all percepts are in the mode of presentational immediacy, and that our construction of causal relations is thus illusory. For Hume, of course, notions of cause and effect were subjective projections imposed over constant conjunctions of events. Most sophisticated philosophical versions of realism reject this argument. Whitehead, for example, acknowledges that presentational immediacy, which derives from visual feelings, is a process lifting into clear, distinct prominence and relevance the ‘extensive’ relations of the contemporary world. However, in contrast, he argues that causal efficacy, which derives from visceral feelings, is a process occasioned by “extreme vagueness,” and a consciousness of the “settled world in

the past as constituted by its feeling-tones, and efficacious by reason of these feeling-tones”. In summary, while visual feelings are precise and trivial, visceral feelings are vague and important. A mixed mode of Symbolic Reference results when visual and visceral feelings are combined.

Although Whitehead’s characterisation of visceral perception should make us wary of any contention that Whitehead suffers from an excess of rationality, some commentators have argued that all of his philosophical categories have been influenced by, if not derived from, an early exposure to formal logic. For David Harrah (1959: 422), Whitehead is a creative mathematician who recognized the resemblance between forms creativity both in his own field of practice—the “‘root metaphor’ in his thinking”—and in other scientific and artistic fields. He goes on to argue that Whitehead’s creative procedure can be decomposed, in accordance with arguments set out in the preface to Russell and Whitehead’s *Principia Mathematica*, into deduction or analysis (discerning the structure of a system and then generalizing, unifying and organizing the resulting subject-matter) on one hand, and induction or synthesis (reconstructing the original subject matter along new lines) on the other. Harrah argues that these two procedures, which can be used equally by the mathematician and the metaphysician, “colour” Whitehead’s ontology. He instances Whitehead’s notion of the *many becoming one*, noting that it relates both to existence as the acquisition of pattern by feeling, and the human self as a process entailing the shaping of material into a pattern. However, Harrah (1959: 423) suggests that this notion “derives from” the mathematician’s schemas of induction (forming a genus from several species), and deduction (drawing one conclusion from several premises), as reflected in the passage from a disjunctive set of eternal objects to a conjunctive form of definiteness, or that from many past actualities to one new actuality, and from many heterogenous data to one prehending entity<sup>2</sup>.

At times, Harrah goes to ludicrous lengths in demonstrating his thesis, even relating quasi-Platonic eternal objects to the mathematician’s requirement for symbolic forms that can fix ideas in preparation for the next creative advance. Similarly, the Spinozan notion of immanence of eternal objects to actual occasions is reduced to a process of deploying established theorems as the basis for new inference and looking at a range of possibilities opened up in deciding which new theorems to prove. Even Whitehead’s metaphysical pluralism, along with the concepts of creativity and connectedness, is related to this two-fold influence of premises over theorems and theorems over premises, while the distinction between actual occasion and nexus is linked by Harrah (1959: 426) to the two-stage process in *Principia Mathematica* of proving first the one-variable case and then the two variable case<sup>3</sup>.

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<sup>2</sup> Although Harrah (1959: 423) concedes that Whitehead cites the 19th century logicians Peirce and Bradley, amongst others, as influences over his metaphysics, he argues that Whitehead was “receptive to these sources only because he had first been impressed by the root schema through his mathematical practice”.

<sup>3</sup> In his elaboration on the twenty seven Categories of Explanation, Whitehead (1978: 33-39) defines a nexus is a set of actual entities in the unity of relatedness constituted by their prehensions of one another; a proposition is a unity of actual entities (logical subjects) in their potentiality for forming a nexus, where this potential relatedness is partially defined by eternal objects which have the unity of one complex eternal

Those such as Brennan (1971: 68-69), who attended Whitehead's Harvard Course on *Cosmologies Ancient and Modern*, know that the Greek Atomists, Lucretius, Epicurus, and of course Plato were the main focus of discussion. Significantly, Plato's later dialogues such as the *Timaeus* predominate. In these dialogues Plato had clearly replaced the paradigm of an unchanging world of Forms with one predicated on becoming and Process. Brennan notes that Plato, in the *Timaeus* (30b), specifically argues that neither God nor the World are antecedent to one another. If God and Order is abstracted from the World, all that remains are rigid Forms, if the World and Time is abstracted from God, all that remains is confusion. Similarly, Faber (2000) observes that a three-fold order is evidenced in these later dialogues, represented by the *Unlimited* (the numberless multitude or infinite dyade and abyss), the *Concrete world* (a finite multitude transformed into numbers), and a structuring (differentiation) performed by *Unity as limit*. Faber argues that Whitehead, too, embraces this Pythagorean disposition in his mature works such as *Immortality* and *Mathematics and the Good*, where the four "formative elements"—the World, Ideas, Creativity, and God—are now reconstructed with the Limit as whole becoming the very body of the Plural World, with Unification producing Ideas (in the form of both persistence and pure potentiality), with Creativity now seen as being derived from the interaction of infinite and finitude, and with God conceived as immanence (the actual integration of the infinite with finitude). However, the theological terminology is somewhat misleading, given the interpretation that Whitehead makes of both finitude and infinitude:

The contrast of finitude and infinity arises from the fundamental metaphysical truth that every entity involves an indefinite array of perspectives, each perspective expressing a finite characteristic of that entity. But any one finite perspective does not enable an entity to shake its essential connection with totality. (Whitehead, 1968: 60)

Moreover, Whitehead stipulates that,

Apart from the finite, the infinite is devoid of meaning and cannot be distinguished from nonentity. The notion of the essential relatedness of all things is the primary step in understanding how finite entities require the unbounded universe, and how the universe acquires meaning and value by reason of its embodiment of the activity of finitude. (Whitehead, 1968: 81)

Whitehead's use of finitude and infinitude in this context is undoubtedly closer to Henri Bergson's conception of the ontological domains of the virtual and the actual rather than it is to Scholastic notions of creative and divine infinitude and created finitude. As observed by Grattan-Guinness (2002), even Whitehead's strictly mathematical research was influenced by this "Pythagorean turn" as revealed, most notably, in his increased

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object (the predicate); and, a multiplicity as a unity of many entities constituted by the fact that its constituent entities satisfy at least one condition that no other entities satisfy.



emphasis on the role of pattern in *Essays in Science and Philosophy*. Although, in part, this represented a return to an earlier, superceded conception of patterns as present in space but enduring in time, apparent in Whitehead's work of the mid-20s, Grattan-Guinness (2002: 456) contends that pattern is deployed conceptually to establish a firm link between mathematics and philosophy, with algebra conceived as the technique, *par excellence*, for the representation of finite patterns. In fact, Whitehead (Whitehead, 1968: 84) goes so far as to equate the infusion of pattern into nature with the Platonic concept of the Good<sup>4</sup>:

Thus, the infusion of pattern into natural occurrences, and the stability of such patterns, and the modification of such patterns, is the necessary condition for the realization of the Good.

For Whitehead (1968: 61-62):

The World which emphasizes the multiplicity of mortal things is the World of Activity. It is the World of Organization: It is the Creative World. It creates the Present—namely, upon “Creation Now,” where the reference to transition has been omitted.

[...] And yet Activity loses its meaning when it is related to “mere creation now”: the absence of Value destroys any possibility of reason.

[...] The World which emphasizes persistence is the World of Value. Value is in its nature timeless and immortal. Its essence is not rooted in any passing circumstance. The immediacy of some mortal circumstance is only valuable because it shares in the immortality of some value.

## **A Priorism**

Although Whitehead considers himself to be a metaphysical thinker, his metaphysics is never far removed from the empirical. Whitehead discusses two conditions for successful pursuit of metaphysical truth. The first proceeds by the method of generalization beyond the immediate origin, while the second proceeds by subjecting imaginative construction to the rationalistic ideals of coherence and logical perfection. Nevertheless, the ideal of speculative philosophy has both its rational side and its empirical side, which must be brought together:

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<sup>4</sup> While it would take too long to adequately address political aspects of Whitehead's thought, Morris (1990) has highlighted the relationship between Whitehead's notions of the interweaving of opposites and his New Liberal espousal of openness to novelty. While classical liberalism promoted compromise between competitive strife and harmony, eliciting what Whitehead called the minor form of beauty, for his part he advocated an interfusion of strife and harmony, with the objective of eliciting what he calls the major form of beauty and achieving an intensification of individuality, thus contributing to, rather than detracting from, the common good.

The rational side is expressed by the terms 'coherent' and 'logical'. The empirical side is expressed by the terms 'applicable' and 'adequate'. But the two sides are bound together by clearing away an ambiguity which remains in the previous explanation of the term 'adequate.' The adequacy of the scheme over every item does not mean adequacy over such items as happen to have been considered. It means the texture of observed experience, as illustrating the philosophic scheme, is such that all related experience must exhibit the same texture. Thus the philosophic scheme should be 'necessary,' in the sense of bearing in itself its own warrant of universality throughout all experience, provided that we confine ourselves to that which communicates with immediate matter of fact.

Whitehead instances as an example of 'incoherence' the Cartesian postulate of a dualist world with two substances, corporeal and mental. He further commends Spinoza for modifying Descartes's position to one of greater coherence through the concept of substance, attributes, and modes (although he complains about the arbitrary though structurally necessary introduction of the 'modes'). Whitehead (1978: 10) specifically acknowledges the fact that the philosophy of organism is closely allied to Spinoza's scheme of thought:

But it differs by the abandonment of the subject-predicate forms of thought, so far as concerns the presupposition that this form is a direct embodiment of the most ultimate characterization of fact. The result is that the 'substance-quality' concept is avoided; and that morphological description is replaced by description of dynamic processes.

Moreover, Whitehead (1968: 81) attempted to find a balance between Spinoza's infinite and Leibniz's "windowless" monads:

Among philosophers, Spinoza emphasized the fundamental infinitude and introduced a subordinate differentiation by finite modes. Also conversely, Leibniz emphasized the necessity of finite monads and based them upon a substratum of Deistic infinitude. Neither of them adequately emphasized the fact that infinitude is mere vacancy apart from its embodiment of finite values, and that finite entities are meaningless apart from their relationship beyond themselves.

It must also be recognized that Lawson's critique of Whitehead's "excessive" emphasis on the *a priori* and on categorical logic, should target the categories of process philosophy rather than those of a formal logic as such. Whitehead's categories (1978: 32-9) are those pertaining to existence (occasions, prehensions, nexus, subjective form, proposition, disjunctive multiplicity, and contrasts or modes of synthesis), to the Ultimate (whereby a disjunctive diversity of actual occasions becomes a conjunctive unity), and to explanation (which describes the becoming of actual entities in terms of the transition from potential unity to actual unity). The twenty-seven categories of explanation provide a description of actual entities through an analysis of prehensions (the actual entity, the datum prehended, and how it is prehended in relation to conceptual or physical modes). As such, they are *a posteriori* rather than *a priori* notions.

## Dualism

Nelson's critique of dualism in Critical Realism focuses specifically on the subject-object dichotomy. This point seems to have eluded Lawson who only responds by highlighting other forms of dualism within Whitehead's thought. This misunderstanding no doubt reflects the growing divergence between the Analytical and Continental traditions of philosophy after the Kantian "revolution". For Hegel, the movement of the dialectic—historical and logical—would resolve the duality between the knowing subject and the known object through the self-destruction of reflexive reason (which mediates between opposites) and the perfection of speculative reason (which forms higher unities). It is argued above that Lawson flirts with these Hegelian notions only in observing that that underlying mechanisms are often actualized through "contradiction" and "tendential" forms of development. However, his consideration of epistemological issues is largely confined to an evaluation of the truth claims of scientific practice, conceived in relation to the three ontological layers posited by Critical Realism: underlying mechanisms, what is actualized, and what is experienced. Scientific knowledge progresses through an unfolding "logic of scientific discovery", which operates through interactions between experimentation (under conditions of closure) and theoretical elaboration, to the point where the underlying mechanisms can be appropriated. In contrast, for Spinoza, the dichotomy between Substance and mode or subject and object is resolved through a process of "becoming eternal" that is accomplished through what he calls the third kind of knowledge<sup>5</sup>. This raises the obvious question of whether a similar notion of knowledge can be discerned in Whitehead's thinking. It will be seen that the answer to

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<sup>5</sup> Knowledge of the first kind (opinion or imagination) obtains when we form universal notions either from singular things represented to us through the senses, albeit, in an unordered or confused way (Spinoza calls this knowledge from random experience), and from signs or ideas of things that we have heard or read about that we recollect (Spinoza 1996: II, P40, S2). Knowledge of the second kind (reason) arises from common notions or adequate ideas of things; while knowledge of the third kind (intuition) proceeds from an adequate idea of the formal essence of certain attributes of God to the adequate knowledge of the formal essence of modes or things (Spinoza 1996: II, P38-40). Spinoza calls the understanding arising through the third kind of knowledge, knowing under a species of eternity, because it is an understanding which depends on mind, as on a formal cause, insofar as mind itself is eternal (Spinoza 1996: V, P29, P31). Significantly, this Spinozan analysis lends itself to a materialist rather than a theological interpretation. For instance, in their materialist reading Althusser and Balibar (1970: 107), conceive of the third kind of knowledge as the "adequate knowledge of a complex object by the adequate knowledge of its complexity".

this question also helps to resolve Lawson's complaint that Whitehead's dualism is effectively displaced onto God himself.

We have seen that Lawson highlights the apparent duality between eternal objects and actual occasions in Whitehead's process philosophy. He also argues that this distinction is carried over to Whitehead's dualist conception of God as a Being divided into both his primordial and consequential aspects. In the last chapter of *Process and Reality*, Whitehead (1978: 11, 135) actually describes the *threefold* nature of God, conceived in terms of (a) the conative urge towards realization; (b) the formal principle of concrescence<sup>6</sup>; and (c) the ground and expression of accidental creativity. Whitehead argues that the primordial nature of God is deemed necessary but deficiently actual, because he is dependent on actual occasions for developing his consequent determinate nature through a process of self-creation. In other words, the Divine for Whitehead is an immanent power. Although Whitehead (1978: 522-524) insists, too fervently perhaps, that God is not a Spinozan substance, nevertheless, he concedes that attributes are assigned to him insofar as he is conscious of the inter-relation between things as a unity: as objects become events, these also exist as God's ideas. Accordingly, despite their transience they enjoy an objective immortality. Lawson (and John Dewey) seem unwilling to accept the role played by this notion of immanent causality in Whitehead's thought: a notion which explains how eternal objects and actual occasions are woven together. Through prehension, concrescence and ingress, eternal objects, as with the Spinozan concept of Substance as "the infinite power to act", operate as an *immanent* rather than a *transitive* cause of singular, finite modes.

### ***Concluding comments: Process Philosophy and Political Economy***

Although Whitehead's ultimate ontological category is that of "actual entities", which are regarded as atomistic, he also defines the "Extensive Continuum" as a field of potentiality for actual entities. This field is both real and infinite, but not prior to world. Rather it is a repository for those entities that have already become and have yet to become. While actual entities perish subjectively, they attain immortality objectively. More formally, he (Whitehead, 1978: 112) defines this concept in the following manner:

The extensive continuum is that general relational element in experience whereby the actual entities experienced, and that unit experience itself, are united in the solidarity of one common world. The actual entities atomize it, and thereby make real what was antecedently merely potential. The atomization of the extensive continuum is also its temporalization; that is to say, it is the process of becoming of actuality into what in itself is merely potential. The systematic scheme, in its completeness embracing the

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<sup>6</sup> Concrescence, for Whitehead, is a process through which prehensions are integrated into a fully determined feeling or satisfaction, where feeling is an integration of an actual entity or occasion into the internal constitution of a subject.

actual past and the potential future, is prehended in the positive experience of each actual entity. In this sense, it is Kant's 'form of intuition'; but it is derived from the actual world *qua* datum, and thus is not 'pure' in Kant's sense of that term. It is not productive of the ordered world but derivative from it.

This notion will play an important role in Whitehead's analysis of probabilistic inference. The difficulty for those who espouse an organicist ontology is that everything can be construed to depend on everything else. To get around this problem Whitehead posited a nested ontology predicated on the notion that the structure of inter-relationships amongst entities was more stable at generic rather than specific levels of determination. From a temporal perspective, the shorter the distance into the future events had to be forecast, the greater would be the number of factors that could be treated as given. By the same token, the further into the future events had to be predicted, the larger would be the reduction in what could be treated as given, and the smaller the amount of knowledge that would be available for purposes of prediction.

On the basis of this nested ontology, Whitehead argued that probabilistic inference can only be successfully accomplished if relevant factors are limited to a portion of 'extensive continuum'. Moreover, for the organicist principle to hold such that relations between parts of a given complex are both internal and necessary, the future would have to be derived from the past in a manner that preserves the very existence of this complex. The resulting interdependence would then support rational judgments based on partial knowledge, and provide a solid foundation for applying a frequency theory of probability. Whitehead calls the limited set of possibilities created for any individual 'real' potentiality. In addition, he draws on the distinction established between the two "modes of perception", visual and visceral, to argue that the visceral mode enables the prehending subject to grasp both real potentiality and internal relations.

Winslow (1989) contends that this conception of a nested ontology ultimately convinced Keynes (1936) to abandon the atomistic thinking of the *Treatise on Probability* and embrace an organicist perspective. In turn, it led Keynes to adopt his crucial distinction between short-run expectations (concerning remuneration from the exchange of goods and labour services) and long-run expectations (concerning the return on long-lived financial assets and capital). Of course, Keynes (1937) also drew on psychoanalytic arguments in arguing that, in the face of fundamental uncertainty, investors would resort to "conventions" (such as net present value comparisons and the 'Benthamite' probability calculus) rather than "caprice" in guiding their decision making.

Keynes (1931; cited in Winslow, 2005) also speaks of the reliance of capitalism on the money-making and money-loving instincts, regarding the "love of money as a possession" as a "somewhat disgusting morbidity, one of those semi-criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease. From a Freudian perspective, money love is associated with the anal sadistic character type, allied with the traits of orderliness, parsimoniousness, obstinacy,

and a sadistic love of power. However, Winslow (1986) points out that in a fully-fledged financial crisis Keynes believed that more regressive forms of money love (i.e. an unbridled lust for gold) would rapidly displace more sublimated forms (i.e. the “lure of compound interest”). As Keynes (1936) argues in his *General Theory* Chapter on the Trade Cycle, this would variously affect the preferences of portfolio investors for liquid assets, the anticipated yield on capital investments, and the marginal propensity of wealthy households to save out of household income.

Yet another paper of the same length would be necessary to adequately compare and evaluate Critical Realist interpretations of fundamental uncertainty against those of Process Philosophy. While Mitchell (2007) has partially addressed this theme in his defense of econometric practice against the skepticism evinced in Lawson (1985a,b), his paper does not specifically consider the influence of Whitehead’s process philosophy over Keynes. The objective of this paper has been a fairly modest one. It has defended Whitehead’s philosophy against Lawson’s fourfold criticism that it suffers from excessive rationalism, a priorism, and dualism.

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