4 Science – Sections & Papers

4.1 Mathematics

Section Heads: Claus Michael Ringel
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Tuesday, July 4, morning
Room: HS 104

Session 1

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Meaning and Mathematical Symbolisms

Abstract: Whitehead claims that our use of symbols is not merely a matter of convenience in respect to means of expression and communication: “we enjoy the symbol, but we also penetrate to the meaning.” He thus raises the question whether our choice of symbolisms, such as those of mathematics, is partly but not entirely arbitrary - the symbols ‘discover’ important meanings that both elicit the Heraclitean Logos while ultimately affecting the ways we think and live. What this line of thought signifies for the ancient problem of how to account for the connection between minds and Nature is thus bound up closely with the problem of the role that symbolisms play in perception.

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Metaphysical Models

Abstract: Materialism, epiphenomenalism, dualism, idealism, and dual-aspect theories may all be represented by an appealing abstract mathematical device called a commutative diagram. Properties of the components of such diagrams characterize and, to some extent, even parameterize these systems and attendant metaphysical concepts (such as causal closure and supervenience) in a unified framework; process thought is of particular interest in this connection. In some cases we can even exemplify the theories typified by these diagrams in explicit graphical models. All of this tends to clarify the relationships among key philosophical positions and to sharpen our sense of the effective domain and principal limitations
of each. Systematic variation of these abstract diagrams may even suggest
cogent metaphysical systems yet to be examined.

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Whitehead and Pythagoras

Abstract: Pythagoreanism still attracts the allegiance of leading
theoretical physicists and mathematicians, and it is this doctrine that
process philosophers must confront if they are to successfully defend their
metaphysics. Peirce, Bergson and Whitehead were acutely aware of this
challenge, and attempted to circumvent it. The problem addressed by each of
these thinkers was how to account for the success of mathematical physics
if the world consists of creative processes. In this paper I examine the
nature of the challenge posed by Pythagoreanism to process philosophy and
examine the efforts by process philosophers, particularly Whitehead, to
overcome it.

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The Magician’s Adventures in the World: Becoming, Creativity, and the
Transversal Communication

Abstract: This paper adopts an unusual stance: it uses one of the Tarot
cards, “The Magician”, in the context of process-philosophy in the
tradition of Alfred North Whitehead. It also brings into the conversation
philosophical thinking of American pragmatists Charles S. Peirce and John
Dewey, as well as French poststructuralist Gilles Deleuze. Some of their
conceptualizations are explored in this paper for the purpose of explaining
the meaning of “The Magician” and asserting the function of this sign in
the natural world. From the perspective of the logic of explanation, the
image of the Magician may be considered to be an index of non-mechanistic,
mutualist, causality that enables the dynamics of self-organization. The
action of the Magician is such as to establish an unorthodox, transversal
(Deleuze’s term) communication, which is capable of bridging the dualistic
gap between mind and matter, science and magic, process and structure, the
world without and the world within, subject and object, human experience
and the natural world, overcoming thereby the paradox of the connectedness
of things (see Whitehead’s Adventures of Ideas). The number corresponding
to “The Magician” card in a deck is “1” – as a symbol of the one world
without and within (Ibid) or identity between the world within experience
and the world beyond experience, equivalent to the ancient Hermetic formula
as above so below. In fact, the figure of "The Magician" is Hermes - the
Gods’ messenger that enables communication between the apparently disparate
levels of reality, creating genuine novelty when it intervenes into the two
realms described by deterministic equations (classical and quantum alike)
crossing over the uncertain cut between them. “The Magician” represents a
certain quality that acts as a catalytic agent (see Whitehead’s Process and
Philosophy and Modes of Thought) embedded in the system’s dynamics and
capable of eliciting transmutations, that is, the emergence of novelty. “Becoming” and “creativity” are concepts central to Whitehead’s process philosophy, and it is the Magician’s (auto)poetic and creative action that represents an occasion of experience constituting the very process of becoming. The paper concludes by presenting a model for the process-structure that incorporates the transversal communication in its very dynamics. The model utilizes mathematics on the complex plane and the rules of projective geometry, and the corollary is such that the presence of “The Magician” in the world enables a particular organization of thought, which makes pre-cognition possible.

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Process Category Theory

Abstract: History amply demonstrates that however profound the idea, however great the genius of of its originator, fuller understanding and the benefits of implementation follow in every branch of science and technology when the idea can be represented formally. First it seems the informal stage then to be followed by the formal is the natural order. There can be no better evidence of the truth of this principle for all in due season than from the work of Alfred North Whitehead. For one of the authors of Principia Mathematica then subsequently to proceed to expound the whole philosophy of process with scarcely a mathematical symbol shows not only great self restraint but wisdom that the tools needed to represent process were not then to hand.

However during the course of the second half of the twentieth century there has arrived on the scene the concept of the arrow emerging from within category theory and out of a confluence of algebra, geometry and topology. The arrow is able to represent formally the full glory of the philosophy of process. From its origins in Pure Mathematics with the emphasis of the times wedded to the axiomatic method, category theory has tended to be heavily biased towards the category of sets which stresses Parmedian invariance but the arrow also contains the full richness of Herecleitean variance (both the covariant and the contravariant).

The great detail of Whitehead's philosophy can be abstracted in existing category theory but with an abstraction that loses none of the detail. His 'category of the ultimate' is to be found in the topos. The 'category of existence' is the cartesian closed category which gives not just mathematical existence in the sense of consistency but also justifies physical existence with exponentials and limits. For the arrow is an 'actual entity' satisfying 'an occasion'. The natural transformation as an arrow provides Whitehead's 'category of explanation' and his 'categorical obligation' is the underlying functor. Perhaps most important of all is the monad over adjointness which not only captures every relation of Whitehead's 'category of prehension' but also connects with the perception of Leibniz' monad.

Category theory itself is today itself under attack as without foundations but in fact it has one of the strongest of all philosophies to support it painstakingly worked out by Alfred North Whitehead.
Tuesday, July 4, afternoon  
Room: HS 104  

Session 2  

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The Role of the Natural Numbers and the Real Numbers in Whitehead's 
Cosmology. (On Kronecker's dictum: "God made the natural numbers; all else 
is the work of man.")  

Abstract: The German mathematician and logician Kronecker opposed the work 
of Georg Cantor on infinite sets and summarized 
his view that arithmetic and analysis should be based on whole numbers only by saying, "God made the natural numbers; all else 
is the work of man" (see Bell 1986).  
Turning Kronecker's rating upside down, one may interprete the dictum 
quite differently: as soon as one accepts the natural numbers as being 
God given, the further mathematical constructions which lead to 
the set of real numbers, to function spaces and so on, are sound ones, 
but it is the believe in the naturality of the natural numbers that 
cannot be justified rationally, it is just part of religion.  
Note that this reservation concerning the natural numbers is not at all 
related to Goedel's incompleteness result (which only Muenchhausen, but 
no proper mathematician worries about), but on the problems which arise 
when dealing with arbitrarily large (or equivalently, with arbitrarily 
small) numbers in nature.  
The lecture will try to point out Whitehead's distrust in the natural 
numbers, and his active use of the "work of man" (in his theory of 
extension). Whitehead's cosmology avoids to presuppose any manifold 
structure as basis, but exhibits a kind of sheaf-theoretical approach.  
It should be discussed what kind of changes to his topological view are 
necessary in order to take into account the quantum theoretical knowledge.  

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The Adequacy of Language for Finite Domains of Reference  

Abstract: A formal system is constructed which generates a finite set of 
statements that correlate 1-to-1 with the facts of a finite domain. Each 
formal statement transcribes directly to English, so the adequacy of 
language in general is entailed by the adequacy of the formal system. The 
crux of the argument involves giving precision to the phrase "finite domain 
of reference." It is assumed that any such domain consists of a finite 
number of individuals connected to one another by a finite number of 
relations. A domain of three individuals is examined in detail, which
serves to show that any relation is constructible from a pair-wise relation. This in turn implies that the realm of finite mathematical structure can be systematically generated by an algorithm. An important domain of reference for the formalism is obtained by interpreting the primitive relation as "time order." We then see what Russell and Whitehead's "eventism" looks like when restricted to a finite domain.

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The Whiteheadian Context of Some Formal Theories of Space

Abstract: Formal problems of space occupied Whitehead’s thought for the greater part of his professional life, and span the era from his purely mathematical researches up until his final presentation of his theory of extension in Process and Reality. Work in areas that might be characterized as “the logic of spatial reasoning” has advanced since Whitehead’s day. But Whitehead’s work continues to be of relevance here, and I wish to survey two areas of particular interest while suggesting possible avenues of further development for each. The first of these areas is mereotopology, which explicitly traces its roots back to Whitehead’s work on the theory of extension. The second is modal logic, an area in which, to my knowledge, no one has built any explicit links to Whitehead’s thought, but which invites such connections at a number of levels.

This paper is organized into three parts, with the first two focusing on mereotopology, and the third on modal logic. Part I will rehearse some of the history of Whitehead’s own work on various problems in the logic of spatial reasoning. Unfortunately, Whitehead’s work on extension languished in the secondary literature for almost sixty years. Part II picks up with the re-invigoration of Whitehead’s formal thought by Bowman Clarke in the early 1980s, and traces how this has since morphed into contemporary mereotopology. A novel line of inquiry will then be suggested, specifically that there is a potentially fruitful connection to be drawn between Whiteheadian mereotopology and von Neumann’s Continuous Geometry, i.e., axiomatic projective geometries of infinite dimensions in which the primitive elements are all extensive in character.

Finally, Part III turns to the connections between modal logic and spatial reasoning. This topic, while vigorously investigated by formal logicians, has received scant attention from philosophers at large, and process thinkers in particular. This is unfortunate, since one ought to be profoundly puzzled that modal operators for possibility and necessity behave just like topological operators for closure and interior. Given the profoundly relational nature of process thought, it becomes a matter of particularly process-oriented interest whether or not there is a fundamental connection between spatial thinking and relations of possibility. Alternatively, taking to heart Henri Bergson’s warning against the naïve use of spatial metaphors, the above could indicate a profound inadequacy in our current conceptualizations of modal relations.
Randomness in the Logic of Arithmetics

Abstract: This paper will discuss information theorist Gregory Chaitin’s claim that randomness is a characteristic of arithmetic. The discussion strongly suggests the need for a rethinking of metaphysics. I will follow the problem of algebraic countability from Hiblert, Gödel and Turing and end with Gregory Chaitin’s demonstration of randomness in arithmetic. The significant claim that randomness is a characteristic of attempting to answer some important but very unusual questions in the logic of arithmetic will be examined in light of the metaphysical implications. If one can find issue in the system of arithmetic then this means that the same issues will permeate in other similar systems. Chaitin claims that a primacy of information is necessary for an appropriate understanding of the issue of randomness in arithmetic which leads me to the speculation that a new type of information process metaphysics is the key to bridging process philosophy with a modern mathematical-scientific understanding of the world.

Dynamic Epistemic Process Logic DEC1-DEC2

Abstract: Firstly, we construct the dynamic epistemic process systems DEC1-DEC2, give some results of their proof theory. Secondly, we introduce the order neighborhood semantics, give the frame conditions of the character axioms and rules of DEC1-DEC2, prove the frame soundness of DEC1-DEC2 with respect to the frame conditions, respectively. Finally, we prove the frame completeness of DEC1-DEC2 with respect to the frame conditions as well, respectively.
Did Whitehead and Einstein Actually Meet?

Abstract: In the last footnote of the chapter on Whitehead's Theory of Relativity in Robert Palter's standard work Whitehead's Philosophy of Science (1960, p.213), Palter thanks John Coleman – here present – for the reference to Philipp Frank's Einstein biography, Einstein: His Life and Times (1947), because this biography claims (on p.189) that when Einstein visited England in 1921 he and Whitehead discussed the theory of relativity. When reading this footnote a couple of months ago, it immediately aroused my interest. But when turning to Joachim Stolz's more recent book Einstein und Whitehead (1995) to find out some more on this interesting discussion, my arousal got frustrated. Stolz writes (on p.30): "Thus we come to the central question of Whitehead's relation to Einstein. There is only one biographer, Philipp Frank, who holds that both men met in London in 1920, but this is not in any way confirmed."

In order to make up my own mind on this issue, I first consulted the two volumes of Victor Lowe's monumental Whitehead biography, Alfred North Whitehead: The Man and his Work (1985 & 1990), but could not find any hint that Whitehead and Einstein had ever met. Given Lowe's authority as a Whitehead biographer, I assumed Stolz was right to suggest that the alleged meeting was fictitious. However, I also consulted the source of confusion, Philipp Frank's biography, and found out that the person who invited Einstein to visit London in 1921, was an acquaintance of Whitehead: Richard Haldane, a British philosopher and politician. Taking Haldane as an important clue to guide me while doing some further research on this issue, I found a wealth of information proving Stolz wrong, and enabling me to give a more complete picture of what actually happened.

The least I can say in this abstract is: Einstein and Whitehead did in fact meet in London in 1921 (not in 1920), and this is not only a Philipp Frank account, but a fact that has been confirmed by numerous other biographers. In this lecture I want to tell the story of my little historical search, and I want to share some of the interesting stuff I found along the way.
On Eddington, Whitehead and Einstein

Abstract: As a physicist, my comparison of these three brilliant scholars has emerged from 68 years of coping with both their physical theories and their philosophical interpretation. Criticising Eddington's attempt in the last 15 years of his life to "harmonize" GRT and QM provided the material of my PhD thesis supervised by Einstein's collaborator, Leopold Infeld. Already in 1928, Eddington recognized a problem with reconciling GTR and QM. My 1943 thesis was flamboyantly entitled "Relativistic Quantum Theory"! Fortunately, but accidentally, I read Whitehead's Principle of Relativity before tackling the mathematical exposition of Einstein's GRT and had accepted ANW's statement that there is a logical lacuna in GRT, which implies that there is no logical way in which the results claimed can be directly associated with observations! For details, see my introduction to Synge's Lectures on Whitehead's Theory (ArXiv.org: Physics/0505027).

Eddington, in contrast, believed that both GRT and QM are precisely correct and chose a problem that could be solved exactly by both theories. He equated the two results and obtained a relation between Planck's, and the Cosmological, constant. Eddington then calculated ten constants of nature, all within about one part in ten-thousand. In those days, all physicists "knew" that this was impossible. Fifteen years of Eddington's work was then dismissed as "philosophical" nonsense. It was not noticed, however, that the only valid conclusion was that one or both of QM and GRT must be incorrect. In my opinion, Whitehead has the great advantage of being relatively modest in only claiming to make a first step beyond Newton's theory of gravitation while satisfying new insights gained from Einstein's special theory of relativity and also giving precise operational meaning to terms used for mathematical formulations of physics. For reasons advanced by Dean Fowler and additional considerations, I believe that the key paper of Clifford M. Will, purporting to administer the coup de grace to the simplest of Whitehead's four theories, is not convincing. A critical reexamination of Will's paper is yet needed in addition to a reassessment of Whitehead's unique approach to relativity theory and his critique of GRT. Essential to understanding Whitehead's thought is his Enquiry Concerning the Principles of Natural Knowledge, the first of his physics Trilogy, in which we find his initial definition of several words which cause difficulty for readers of his later works, and in the Preface and first Chapter he announces the Leit Motif of his whole Corpus: a mathematical physicist explores the total human situation.

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The Principle of Relativity in Whitehead's Philosophy of Nature

Abstract: According to Aristotelian ontology, Being precedes Becoming because the former is the actuality of the latter. The opposite is the case with Whitehead. Becoming is the actuality of Being: what has been thought to be substantial Being must be re-interpreted as derivative from Becoming. Therefore the most fundamental category of nature should be found in "events," and not in "substance." Whitehead tried to reduce physical entities, which were previously considered as substantial Being, to the Becomingness of interrelated events. What he means by "event" must not be interpreted as something cut off from the pre-existing continuum of space-time, but the space-time itself is an abstraction from the concrete
relatedness of events. What must be noticed here is that the concept of events as four-dimensional structures plays the role of mediation between space and time. Both matter as a self-identical substance and space-time as a fixed framework of physics are to be deconstructed to the interrelation of becoming events. Whitehead executed such deconstruction by what may be called the reversal of subject-predicate logic. In classical physics matter is treated grammatically as subject, and its spatio-temporal determinations as adjectives. Whitehead, on the contrary, treats matter as an "adjective" of 'four-dimensional events with specific characters. Material beings are considered by him, not to be causes of perceived qualities, but treated merely as one of many adjectives uniformly modifying events. This does not mean that events occupy the place of substance, for the essence of an event consists in its relatedness. The reason why classical physics had to fix separately the framework of space and that of time was that it lacked necessary means of representation for four-dimensional events. Whitehead, adopting Minkowski's idea that four-dimensional manifold should give the framework of relativity theory, tried to deduce that framework itself from the interrelated structures of events. This procedure was called by him "the method of extensive abstraction," according to which the elements of Minkowski's manifold, event-particles without extension, were mathematically re-constructed from becoming events with spatio-temporal extension. Thus Whitehead endeavoured to reconstruct the fundamental categories of physics after having deconstructed classical physics through the relativistic reduction of Being to Becoming. Einstein's theory was to be assimilated to his own paradigm, and at the same time to be criticized in certain points, especially the relation of matter to space-time.

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Measurement, Mereotopology and the Nature of Nature

Abstract: A robust and explicit theory of abstraction is absolutely essential to the philosophy of science. In the absence of such a theory, it becomes impossible to intelligibly relate the structures of science to those of concrete experience. In particular, because an act of measurement is a projection from concrete experience into a purely abstract structure – typically the real number line – it is a specific kind of abstraction. Thus, a theory of abstraction is a cornerstone in the theory of measurement.

It is here that Whitehead’s philosophy of nature and extension becomes of particular interest. Whitehead never explicitly articulated the connection between measurement and abstraction in terms as stark as those used above, yet this connection is clearly present in his thought. Whitehead’s theory of extension – which has become foundational for contemporary work in mereotopology – originated as part of an entire theory of extensive abstraction, whose purpose was to provide the logical foundations for a theory of spatial measurement. This theory of extension and measurement is intimately connected with Whitehead’s theory of nature, and it provides the philosophical underpinnings for his bimetric theory of space and gravity. This paper shall proceed as follows. Part I will examine the fact that all measurement is a kind of abstraction. Part II will sketch Whitehead’s resolution of this problem in the context of his theory of spatial measurement. We will see how his theory of extension evolved within his own works, and mention its current role in contemporary spatial logics. Part III will survey some of the logical relations between Whitehead’s theory of nature and the metaphysical theory of Process and Reality. Part IV, while necessarily brief, is in many respects the payoff of this paper. It will be
argued that an explicit theory of abstraction opens up multiple avenues of potential reconciliation between macroscopic theories of space and gravity, and microscopic theories of quantum mechanics. These routes include the direct path of adopting a Whiteheadian style of bimetric theory of gravity as an alternative to general relativity, and/or the philosophically less satisfying choice of accommodating the macro and micro level of physics as being ultimately irreconcilable due to the fundamentally different kinds of abstractive processes involved with each.

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Whitehead, Bergson, and Local Time

Abstract: The paper will examine the prospects of a local definition of time in connection with Whitehead’s method of extensive abstraction, his assumption of the essential uniformity or congruence of durations, and Bergson’s intuition of the "unity" of time fluxes behind simultaneity conventions in relativity theory. The "passage of nature" on the one hand, the intuition of "duration" on the other, suggest two related yet different strategies for reaching "local time." "Local time" is opposed to "global time" or "coordinate time," although it is not merely a matter of "proper time" (or more generally, of invariant or intrinsic magnitudes). The metaphysical and epistemological implications of this approach to the time of physics remain to be spelled out.

Monday, July 3, afternoon
Room: HS 101
Session 2

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Temporalities

Abstract: Time is enigmatic - the least tangible of all scientific parameters and yet the most basic aspect of experience. We will try to understand the nature of time by looking into the functioning of nature as it is presented by different physical theories, notably: classical mechanics of Newton, special and general relativity of Einstein, quantum mechanics, cosmology, string theory, and quantum gravity. Notions of time originating from these different physical theories are not identical. They range from absolute, rigid specifications of time to internal, relational considerations of time. We will contrast concepts of time used in modern science to Peirce’s evolutionary metaphysics and Whitehead’s process philosophy. This analysis attempts to bypass the being-becoming dichotomy to frame an "ontology in the temporal" and to suggest temporality as a mode of the existence (τρόπος υπάρξεως) of being.
Process Contents of Feynman’s Formulation of Quantum Mechanics

Abstract: There is a rather general agreement that Feynman’s formulations of quantum mechanics stands out from other formulations because of its demonstrativeness, successful application of the principle of least action, and meeting the requirements of the Special Theory of Relativity in a very natural way. Although this version of quantum mechanics is rather cumbersome for everyday use by physicists, it has shown its effectiveness in powerful formulation requisite problems in many areas of modern physics: in cosmology, quantum gravity, physics of the black holes, QED, GWS theory etc. In spite of the above facts most physicists treat this formulation instrumentally. Richard Feynman sometimes considered it instrumental but when he tried to popularize his ideas he used deep metaphors, which have many philosophical implications. The main aim of the presentation will be making an attempt of revealing a few metaphysical possibilities that can be hidden behind Feynman’s version of quantum mechanics. One can draw an analogy between notions such as quantum path, quantum alternative, superposition etc. and some Whitehead’s categories, for instance: prehension, conceptual reversion or concrescence. The physical notions disclose new interesting prospects for modification and development of the process metaphysics. The thesis of the quantum-fibrous structure of the real world will be discussed.

Prehending Strings and the Quanta: A Whiteheadian Framework for a Unified Theory of Physics

Abstract: Whitehead’s cosmological framework found within his formulations of nature, relativity, and ultimately metaphysics, suggest the underlying structure within which contemporary physics can find a place of resolution. Current theories are trying to combine Einstein’s relativity with the uncertainty of quantum mechanics, two notions that seem to be equiprimordial within Whitehead’s framework. While Whitehead incorporates a unique formulation of relativity similar to Einstein’s, his notion of concrescence resembles some contemporary theories in quantum mechanics, e.g. decoherence. Contemporary physicists like Brian Greene and Lee Smolin, while searching for a unified theory, have come to similar conclusions as Whitehead regarding the intermingling of these atomic forces. Greene, in searching for the final atomic element of the universe, posits tiny vibrating filaments that seem to resemble vibrating prehensions. Smolin suggests that string theory, loop quantum gravity, and classical approaches to modern physics all suggest discrete spatiality on the quantum level. The Whiteheadian theory of prehensions could lead to a resolution of the absurdities derived from having spatial and temporal continuity, i.e. infinity, if credence is given to Whitehead’s genetic and coordinate divisions of actuality. Whitehead’s theory also resembles another approach called quantum field theory in that the extensive continuum itself is a
field of geometrical relations from which concrescent actuality emerges. Whitehead’s physics can be viewed as, in Smolin’s words, background independent—a self-evolving system—since, like Smolin, Whitehead places processes as the most fundamental elements of the universe. It is in this mode, as background independent, that Greene suggested furthering string theory, though his physics suggest the classical conception of concrete matter, viz. vibrating strings. The two main focuses of this paper will be: 1) the philosophical similarities between Whitehead’s theories and string theory, loop quantum gravity and quantum field theory, and 2) suggesting the evolution of the extensive continuum—God’s consequent nature implying absolute relativity—through the fundamental question that Whitehead left unanswered, ‘does the consequent affect the primordial?’ These two focuses, broad as they both are, suggest how similar Whitehead’s thought is to some conclusions of contemporary physics and will hopefully provide the impetus for further research. Some current research in both the physics community and the process community will be considered for clarity and augmentation of my thesis. Absent from this paper will be the mathematical comparisons between the theories, with the main focus being on the general systematic and philosophical convergences.

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From Maxwell's Field to Whitehead's Events: The Adventure of a Revolutionary Idea

Abstract: This essay investigates the influence of James Clerk Maxwell's electromagnetic theory and the concept of a physical field on A. N. Whitehead's ontology of events. In his attempt to accommodate the advances in 20th century physics, the concept of an electromagnetic field and the idea of space-time from Einstein's general theory of relativity form the basis of Whitehead's endeavor to formulate a unified theory. In the final part of this essay, I address the status of physics at the beginning of the 21st century and evaluate Whitehead's project in terms of the limited success toward unification of physical theory.

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Rethinking the Second Law: Carnot’s Epiphany and the Concept of Work (Part One)

Abstract: History of science and engineering show us two paths to thermodynamics. Boltzmann’s research program, based on the atom, aims to improve our understanding of the world. Carnot's research program, based on the engine, aims to improve efficiency. According to Atkins (The 2nd Law): "Thermodynamics still has both aspects, and reflects complementary aims, attitudes and applications.” Modern thermodynamics is a process model. All phenomena are understood as methods (viz. processes) of energy-transfer. Atkins (The 2nd Law): “Both heat and work are names of methods, not names of things.” There are no
‘real’ atoms in the mechanical sense. All real things, from elementary particles to galaxy clusters, are dissipative structures. Carnot’s Epiphany is that ‘energy-transfer’ bifurcates into a linear and a non-linear components (viz. work always has an incommensurable heat loss). In Carnot’s sense work cannot occur in a mechanical system where continuity of type is preserved. Boltzmann’s ‘objective’ systems are ‘isolated’ (closed) and the observer is ‘detached’. Carnot’s framework is an (open) ‘flow’ model with the engineer is a ‘participant’.

Boltzmann’s two, complementary, deterministic frameworks, corresponding to classical and statistical mechanics, are shown to be idealized, limiting cases within Carnot’s broader framework. Sang Wook Yi shows that Boltzmann’s two frameworks are, in practice, ‘competitive and compatible’. Neither ‘reduces’ to the other. Maxwell warning us: ‘no matter how elegant and convincing the proof, never accept that either of these two ways can be derived from the other.’ Once rigorously axiomatized they are both shown to be inherently incomplete – and strangely inter-related. This is expected from Goedel’s Proof.

If Carnot’s engineering program is not reducible to Boltzmann’s mechanical program, then the generally accepted (scientific) definition of the concept of work must be re-examined. ‘Work’ in the engineering context is inseparable from problem solving. The engineer is a blind agent (viz. existential pragmatist) who learns how to solve the defining problem of design by exploring and developing the phase space, both quantitatively and qualitatively.

Carnot’s Epiphany, articulating the “second aspect of the Second Law”, identifies the ubiquitous origin of differences. In Part Two (Rethinking the Second Law: Cosmology from an Engineering Perspective) I characterize more fully the engineering framework, its concept of work and the corresponding model of the universe.
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Abstract: The aim of this paper is to demonstrate the suitability of some of Whitehead’s main ideas for a natural philosophy of organismical ontogenesis. The paper presents one way of combining Whitehead’s process philosophy with modern teleonomic thought. From the system-theoretical perspective, which at the present time dominates theoretical biology, it makes sense to assume that each organism, during its own ontogenesis, often faces different possibilities of further development. On the basis of this assumption, it can be argued that the Whitehedian conceptions of the actual entity and the “entirely living nexus” allow one to consider ontogenetical developments as results of protomental decisions, without falling back to a vitalistic position or violating physical laws.

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Purpose and Creative Advance in Ecological Biofilm Communities of Pseudomonas aeruginosa.

Abstract: Only very recently have microbiologists become aware that bacteria not only live in pure “planktonic” or free-swimming culture but also exist as biofilms – community structures consisting of “like” bacteria encased in a three dimensional polysaccharide mesh that is permeated by channels that allow access to oxygen and other nutrients and support communication between the bacteria. Once bacteria have invaded a host, the
biofilm renders the bacteria highly resistant to antibiotics as well as other assaults, a property not possessed by individual bacteria. Biofilms form after individual bacteria send out “quorum sensing” molecules that allow the bacteria to determine population density. Once the appropriate density is achieved, the bacteria switch from a “planktonic” lifestyle to a community biofilm. More recent evidence suggests that bacteria can also detect “unlike” bacteria and use similar molecules to help establish more complex and diverse biofilm communities.

This paper explores the appropriateness of a process philosophy of chemistry as suggested by Ross L. Stein in 2004, to describe the formation and behaviors of such ecological communities of bacteria. The usefulness of process philosophical terms such as "experience", "purposive action", "creative advance" and "holoarchy" as well as “subjective nature” is explored in the context of such ecological communities of bacteria. Recommendations are presented on the extent to which a process philosophy of chemistry and biology provides a more meaningful model of bacterial behavior in this context than a materialistic philosophy of chemistry.

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The Relevance of Whitehead’s Philosophy of Organism for a Better Understanding of the Phenomenon of Physiological Adaptation of Microorganisms

Abstract: Setting out from the observed adaptive response of cyanobacteria to alterations in phosphate supply, we discuss possible analogies between the process of physiological adaptation and Whitehead’s actual occasion of experience. For this discussion, we elaborate those features of the adaptive phosphate uptake behaviour that evade a mechanistic description. Owing to particular energetic properties of the phosphate uptake system, cyanobacteria respond to fluctuations in the external phosphate concentration by distinct adaptive events. An adapted event is a process in which the uptake system proceeds from one adapted state to the next. In adapted states the energy converting constituents of the uptake system operate under the prevailing external conditions in a coherent manner with least energy dissipation. During a passage between two adapted states, initiated by an environmental alteration, the uptake system is in an adaptive operation mode in which its constituent parts are adjusted to each other until a new adapted state emerges.

Whereas adapted states can be characterized using objective parameters, this is not possible with adaptive operation modes, for the following reason: in an experimental analysis of this mode the organisms adapt to the experimental conditions already during the course of the investigation, making futile any analysis in objectivistic terms. Here the functional integration of constituents appears to be guided by a “subjective aim” that accounts for the self-constitution of the organism under the prevailing external conditions. Along a historic succession of alternating adapted states and adaptive operation modes information pertaining to the self-preservation of the organism is transferred from one adaptive event to the next: the latter “interprets” adapted states of antecedent adaptive events by means of a distinct adaptive operation mode, aimed at maintenance of organismal self-identity. The outcome of this interpretation is again objectified in a coherent state that is passed on to a subsequent adaptive event.
A generalization of this idea to the adaptive interplay of other energy converting subsystems of the cell leads to a dynamic picture in which every new experience of an environmental alteration leads to a re-creation of the microorganism, aimed at unison of all adapted states. The characteristic features of adaptive events are discussed with reference to Whitehead’s notion of actual entity, concrescence of initial data to objective datum, efficient cause, final cause and subjective aim.

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The Ontological Unit: Defining a Structure for the Philosophy of Organism

Abstract: This paper works toward understanding Whitehead’s ontology for the purpose of understanding how mindful activity can be generated by single cells. Where most thinkers would have us believe that mind is generated by the complexity of a central nervous system, I am following an intuition that mind is ‘generated by’ the fundamental activity of the cell’s biochemistry. Whitehead’s ‘Philosophy of Organism’ presents an attractive metaphysics that potentially places mind at the heart of ‘what-there-is’, and can therefore lend an explanation to how mentality can exist in the observed activities of a single cell. In his view, what we typically perceive as insentient matter, such as atoms and molecules, is better viewed as centres of experience, each appropriating its sensed data into itself and expropriating it back into objectification with others. This cycle of activity maintains itself to endure through time as something ‘concrete’, such as a collection of molecules. These molecular ‘centres of experience’ also constitute the cell, but in a particularly dynamic and patterned way. This paper addresses the technical structure of the centre of experience to frame it in a pseudo-reductive ‘ontological unit’. Using a standard control systems diagram, I illustrate the mechanisms of the process in a simple way, drawing out the important terminologies and key notions that make up the ontological unit, namely ‘integration’, ‘satisfaction’, ‘subjective aim’. This works to define the components of the ontology and the structure of their relations, forming a comprehensive description of the Whitehead’s ‘fundamental drop of experience’ made accessible and potentially useful for scientific consideration. The unit must be understood first with a fair appreciation for the deeper implications of applying Whitehead’s philosophy, before spending time structuring these into the nexus, societies, and structured societies found in biological systems. To place this framework back into the biochemistry of the cell will be the subject of future discussion.
Whitehead's Process Model and the Hughes-Ingold Model in Organic Chemistry

Abstract: In the Lowell Lectures, 1925 (subsequently published in ‘Science in the Modern World’, 1926, reprinted CUP, 1953), Whitehead attacked deterministic models in physical science on p. 99 and pp. 133-4. On p. 99 he wrote: ‘In this [my] theory, the molecules may blindly run in accordance with the general laws, but the molecules differ in their intrinsic characters according to the general organic plans of the situations in which they find themselves.’ One of the problems facing physical organic chemists from 1925-1952 was that, in solvolytic reactions involving alkyl halides, the ‘reactive’ hydroxide ion sometimes acted as a stronger attacking species than the water molecule and sometimes as a weaker species in apparently analogous circumstances. The then current deterministic model could offer no solution to this problem. A solution was offered from two chemists, E. D. Hughes and C. K. Ingold, utilizing a process methodology in line with Whiteheadean precepts. The role of the supposedly inert solvent (an 80:20 ethanol:water mixture) was far more subtle than previously supposed and offered a variety of situational ‘organic plans’ mentioned above.

Process Thought Defeats the Ontological Reduction of Chemistry to Physics

Abstract: There is a widely held belief that all questions about chemical entities are really questions about more basic physical entities, that chemistry is ontologically reducible to physics. If true, this belief has profound and far-reaching consequences – the practice of chemistry loses its autonomy as a special science and the philosophy of chemistry loses any claim to legitimacy as a field of valuable scholarship. My goal here is to demonstrate how core doctrines of process thought defeat the ontological reduction of chemistry to physics, and specifically to show that the
properties of a molecule are not ontologically reducible to the properties of the atoms that comprise it.

I argue my premise from a process-inspired molecular ontology. In *Process & Reality*, Whitehead taught us that the molecule is at once an “historic route of actual occasions” (PR 73) and a “structured society” of subordinate occasions (PR 99). As *historic route*, each molecule comprises a succession of molecular occasions of experience. Thus, a molecule evolves through time by processes of concrescence in which it prehends and ‘internalizes’ its own antecedent occasions and other occasions of the universe as they perish into objective immorality. While dynamic and ever in process, a molecule retains its identity by a repetition of patterns of existence. As *structured society*, each molecule comprises nested, inter-relating, subordinate societies and occasions, and is actualized through a social ordering of these subordinate occasions. These ontological features allow the molecule to respond to environmental perturbation not as an aggregate of atoms, but rather as a unitary whole, an ontological unit.

Properties of molecules, such as chemical reactivity, depend on atomic arrangement and connectivity, and emerge from internal and external relationships of the atoms and functional groups that comprise the molecule.

A process philosophy of chemistry reveals that molecules possess an ontological asymmetry – the fact that molecules can be *built* from atoms does not mean that molecules can be *reduced* to atoms. In a relational world of dynamic process, molecules are actual in themselves, requiring no reduction for a legitimate claim to existence.

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**Process Structural Realism, Instance Ontology, and Societal Order**

**Abstract:** Whitehead’s cosmology centers on the self-creation of actual occasions that perish as they come to be, but somehow do combine to constitute societies that are persistent agents and/or patients. “Instance Ontology” developed by D.W. Mertz concerns unification of relata into “facts of relatedness” by specific “intensions.” The systems of Whitehead and of Mertz are similar in that they both avoid the substance-property distinction: they differ in their understandings how basic units combine to constitute complex unities. “Process Structural Realism” (PSR) draws from both of these approaches in order to develop an account of how combinations of processes may produce ontologically significant coherence. The basic tenet of PSR is that whenever a group of processes achieves such closure that a set of states of the overall system recurs continually, then the effects of that coherence differ from any effects that would occur in the absence of that closure. Such altered effectiveness is an attribute of the system as a whole, and would have consequences. This indicates that the network of processes, as a unit, has ontological significance with respect to some interactions. The closed network of processes, together with the conditions that prevail, constitutes the “form of definiteness” of the coherence. Each coherence persists only so long as that form continues to be realized. Constituents (processes, subordinate coherences, etc.) of each coherence contribute to that characteristic, rather than sharing the *defining form* as Whitehead held. Whitehead’s notion of a *shared defining form* applies to successive actualities in societies with “personal order,”
but does not generally obtain for constituent actualities of other societies. If time permits, aspects of some recent research in systems biology, microeconomics, and social psychology will illustrate the applicability of Process Structural Realism.

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Whitehead’s Metaphysical Ontology and Prigogine’s Scientific Ontology: From a Point of View of the Philosophy of Chemistry

Abstract: Whitehead’s and Prigogine’s philosophies of science are similar in this respect that they both are interested in ontology built in the light of modern science. This kind of ontological approach, especially Whitehead’s metaphysical reasoning, is usually regarded as speculative— which should be avoided in philosophy of science (see, e. g., Losee, 1993: 1). Ilya Prigogine and Isabelle Stengers have stressed, however, that “Whitehead’s case ... convinces us that only an opening, a widening of science can end the dichotomy between science and philosophy” (Prigogine and Stengers, 1984: 96). According to them, Whitehead’s *Process and Reality* was devoted to the central problem of Western ontology—the relation between being and becoming. Although speculative, it was an attempt to formulate a philosophy of nature avoiding basic contradiction between science and philosophy. Today, referring to Prigogine’s theory of self-organization as a new paradigm in physical science, we can say that physics and metaphysics are coming together and “[t]he direction which microscopic theory of irreversibility takes gives a new content to the speculations of Whitehead ...” (Prigogine and Stengers, 1984: 310).

Chemistry was a starting point of Prigogine’s non-classical physical theory. The purpose of this paper is to examine Prigogine’s conception of non-classical science in the context of philosophy of chemistry and from the point of view of a theoretical conception of science. Prigogine and Stengers, as well as Whitehead, have not really presented a theoretical conception of science. Science is viewed by these authors as adequate knowledge of the real world, nothing being presupposed about the nature or character of scientificity. However, I would like to argue in favour of introducing a theoretical model of science as an idealised physics-like science called “phi-science” which can be used as a tool of investigation. The general approach in phi-science can be characterised as constructive-hypothetico-deductive, and in non-phi-science as classifying-descriptive-historical. Modern chemistry is actually a combination of constructive-hypothetico-deductive inquiry (phi-science) and classifying-historico-descriptive inquiry or natural history (non-phi-science). Such a combination is also Prigogine’s non-classical science. The birth of non-classical science clearly points out premises, actual aims, and limits of science. This interpretation of non-classical science is different from Prigogine’s view according to which non-classical science has liberated science from the myth of classical science and opened up new perspectives.
Two Approaches to Systems Theory: an Analysis in the Context of Ken Wilber's and Alfred North Whitehead's Philosophical Cosmologies

Abstract: The aim of this paper is to draw researchers' attention to the limitations of the two major approaches to systems theory in contemporary science. These two approaches are: (1) "complexity studies" that include the physical chemistry of Ilya Prigogine, the molecular biology of Manfred Eigen, the complexity thinking of Stuart Kauffman (in the context of biological systems), and some other researches; and (2) autopoiesis in its biological form proposed by Humberto Maturana and Francisco Varela, and autopoiesis in its sociological form proposed by Niklas Luhmann. The architecture of the Kosmos suggested by Ken Wilber is by himself called "all quadrants, all levels, all lines, all states, all types...." It contains four dimensions (quadrants) of being-in-the-world (Martin Heidegger's term), which can be summarised as "I," "we," "it," and "its." As Wilber himself has emphasised, these dimensions arise simultaneously: they tetra-enact each other and tetra-evolve together. Some representatives of the new systems approaches (e.g., Maturana and Varela) have claimed that their biological considerations are holistic and therefore grasp the interior aspects of the world. (The theorists themselves call the autopoietic perspective the "inside" view.) However, these claims seem to be not justified. The autopoietic considerations do not correspond to Alfred North Whitehead's 'process philosophy' ("philosophy of organism"), and they do not involve all Wilber's four quadrants of being-in-the-world. It can be shown that both the "complexity studies" and the autopoietic approach grasp the "it" and "its" dimensions, but not the "I" and "we" quadrants, i.e., they cover only the exterior pole, but not the interior pole of the Kosmos.
Abstract: I would like to discuss general issues that would be involved in applying the ‘process and place approach’ (proposed previously by this author) to chemistry and biology. Reference will be made to important papers recently reported by such process philosophers as Joseph Earley, Ross Stein, and others. What makes Whitehead and Nishida most distinct from other current philosophers is the subjective nature of their philosophies, which is characterized by the presence of the subject contained therein. The close interrelationship between the self and reality (a first-person approach) is also a foundation of their uniquely unified cosmologies.

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A Process Philosophy for the Chemical Sciences.

Abstract: Chemical processes are enumerable and contingent. The modes of contingency vary with circumstances as, for example, in enzymatic catalysis. Such relations among the modes of contingency motivate the construction of an exact process philosophy for the chemical sciences. The scientific ground is the existence of electrical particles; the mathematical ground is the list of atomic numbers. (Each individual atomic number can define “condensations” of “actual entities” into specific electrical particles.) The contingent paths for chemical processes express the moods of a chemical grammar. This grammar was constructed explicitly for exact chemical calculations, including the identification of isomeric structures. Chemical process contingencies are expressed in this existential logic of spatial relations. The deep motivation for this work emerges from the necessity for an exact chemical theory of a biological mutation in order to construct a theory of biological emergence. A biological mutagenic process is dependent on catalytic changes from one DNA isomer to another. The two fundamental processes of chemistry, analysis and synthesis, correspond with two different sentence structures within the existential logic. Analysis corresponds with a grammar of existence, synthesis the grammar of change. The logical validity of a chemical sentence derives from exact commutative relations among the concepts of identity as a name, properties of an identity and chemical structure. The existential logic of analysis constructs a systematic name for the consistent relations among the identity as a structure and its properties as a species. Synthesis corresponds with a grammar of change for existential identities, a grammar that captures the contingent moods of a copula with conservation of material relations between precursors and products. The existential logic of chemical processes can be expressed exactly in terms of discrete and continuous mathematics. A new number system, the perplex number system, expresses the discrete relations among nuclei and electrons. It constitutes a new mathematical symbol system. The additive operations of the existential logic form a neutralizing arithmetic. Each existential subject composed from perplex numbers creates a unique mathematical object, a labeled bipartite graph, that corresponds with the identity, the properties and also with the traditional form of the chemical structure. The new number system and the corresponding notation are not inconsistent with the continuous mathematics of chemical thermodynamics and quantum mechanics as the existential logic starts from different pre-suppositions on the nature of a mathematical relation. In conclusion, the logical structures of process philosophies are vastly
richer than heretofore supposed. Chemical process philosophy generates the existential logic necessary for operations on chemical isomers, such as DNA, and the emergence of life, thus separating crisply the existential logic of the chemical sciences from traditional logic of mathematics and physics.

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Toward a Chemical Model for Metaphor: Process, Polystability and Polysemy

Abstract: At what point and for what reasons does one abandon a rational, well-structured and largely successful perspective or account? At what point do we accept a theory that outstrips experience and jettisons empirical verifiability/falsifiability, for the sake of a reasonable and coherent extension of a competing model? Do we not often refer to such activities as characteristic of the frontiers of science? In chemistry we may ask on what occasions does mechanism fail and metaphoric re-description take over? When is a mechanism itself seen to be a metaphoric re-description? For example, biochemists cannot effectively model or teach the folding process of macromolecules without resorting to decidedly non-mechanical metaphors.

In the present study I will explore the explanatory and cognitive function of metaphor in science through an examination of a special class of chemical processes. Chemical systems far from equilibrium display a broad array of dynamical behaviors that seem to mirror the exotic linguistic potency of metaphor. For example some far-from-equilibrium chemical systems exhibit “bistability,” a condition in which the system can assume one of two entirely different dynamical regimes given the same set of conditions (i.e., pH, temperature, flow rate, initial concentrations). In general, the polystable chemical system displays itself as the chemical equivalent of polysemy and embodies the characteristic responsiveness of organisms, on the one hand, and of poetry on the other. In fact, the chemistry described above does this in such a compelling manner that it may suggest some new insights into the function of metaphor, and in turn feed back on suggestions for understanding how science approaches nature, in general. To frame this perspective I borrow, as Whitehead did, from Plato's great cosmological work, The Timaeus. Plato's speculation that the nature of discourse must somehow match the discourse of nature appears in the preamble to his discussion of the cosmos as an intelligent living creature. I claim that metaphor is the strategy of discourse which is most appropriate for describing a cosmos which “is always becoming, but never really is.” Of such a cosmos, only a “likely account” can be given. Some have taken this to mean that all scientific description is necessarily statistical. This is a fair interpretation, but not the most comprehensive one. "Likely" may indicate the self-conscious use of hypotheses, myths, models, metaphors and analogies to explain physical processes. Harré, Hesse, Ricouer and many others have examined the explanatory power of these epistemological potentialities.

While I agree with many elements of these discussions, I wish to examine a very specific characteristic of metaphor, namely that metaphor resembles the "ordered flux" of open chemical systems, and also that of thinking, living systems such as ourselves. The creative use of metaphor in all fields of endeavor has something significant to teach us with respect to the form, content, and conduct of science. All metaphors are, as Whitehead noted, "mutely appealing for an imaginative leap" of understanding that suddenly illuminates the stage with a new
light, displacing shadows from features that were heretofore considered
concrete, and casting shadows and features into new roles. Metaphors are
propositions in the sense that they “propose” our attention -- lure it
into new unifications of feeling and apprehension. Was Whitehead being
merely metaphorical when he stated that propositions are “lures for
feeling,” or are we to take him at his word?
Representation and Revelation: Microgenesis as seen from the Perceptual Retouch Theory Perspective

Abstract: Perceptual retouch metatheory of microgenetic conscious perception is presented and a variety of psychophysical phenomena explained, based on this theory. In all the cases -- visual masking and metacontrast, perceptual latency priming, flash-lag effect, line motion illusion, the Fröhlich effect, motion-induced blindness, binocular rivalry -- two principal participant processes involved in percept genesis are characterised and their interaction described. The first one of the processes is specific representation of the perceptual contents, updated continuously with impinging sensoriae. The second one of the processes is a general-purpose, unspecific modulation from thalamus serving the function of revelation of the contents represented by the specific system. The ways how this conceptualisation helps fit experimental results from psychophysical and cognitive neuroscience research are discussed. Three domains of synchrony/resonance will be thus outlined: specific resentational binding, binding for consciousness, binding with world essence.

Adding to the Perfect Dictionary: Whitehead, Embodiment & Biosemiotics

Abstract: Psychology is discarding the mechanistic metaphor that has dominated the subject for many years. Mental life is once again being treated as part of organic action, as both James and C.S. Peirce recommended. Organic action is embodied, that is, it is taken by particular organisms, including people, whilst they are embedded in the contingencies of particular circumstances. This style of psychology, variously called the embodied, enactive or embedded approach, accepts that experience itself is primary data rather than a secondary epiphenomenon. It is this that makes embodied approach fundamentally Whiteheadian. As the talk will point out, in Modes of Thought (Whitehead, 1938) Whitehead appears to have seen the shift to embodiment coming. For example, at the very beginning of the book he commends William James for his "... protest against the dismissal of experience in the interest of system." (page 4).
Here, 'system' can be taken to mean the attempts to reduce mental life to neurological or computational mechanisms. Moreover, Whitehead would surely have welcomed the rehabilitation of embodied experience. He recognised that to ignore embodiment is mistaken: "The current philosophic doctrines, mostly derived from Hume, are defective by reason of their lack of bodily reference." (page 209).

The proposed paper will start from these issues to address a theme that brings the argument of *Modes of Thought* to a close. This theme is the 'Fallacy of the Perfect Dictionary' (page 234), by which Whitehead means the belief that science and philosophy can create a closed set of concepts by which the world and the human condition may be fully understood. But Whitehead rejects this. For him philosophy must be open since its purpose is: "... to rationalise mysticism: not by explaining it away, but by the introduction of novel verbal characterisations, rationally co-ordinated." C.S. Pierce, while no mystic, attempted to give a rational account of how human existence belonged in the natural order. He proposed that it depended on the productive elaboration of novel signs. Recent research in biosemiotics has applied Peirce's ideas to the causal structure of living systems. The paper will touch on this research, especially the work of Hoffmeyer (1993). It will suggest there are significant resemblances here to the developments in psychology sketched above, which treat cognition as a product of evolved patterns of embodied, meaningful action. In a very similar sense, Hoffmeyer reminds us that while human meanings are naturally the most immediate and salient to human concerns, they are neither the first nor the only meanings in the biosphere: "We did not invent meaning. This world has always meant something. It just did not know it." (Hoffmeyer, 1993, page 146).

It is presumably not an accident that the 6th. Annual Gathering of Biosemiotics and the 6th. Annual conference of the Process network are taking place in Salzburg at virtually the same time. The author is already presenting a paper to the Biosemiotics meeting. (See http://www.biosemiotics2006.org/). To present a paper to the Process meeting as well will, hopefully, help communication between two disciplines that appear to have much in common.

References.

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Towards a New Theory of Mind

Abstract: A classical view of the mind is 3-dimensional: thinking, feeling, action. The interdisciplinary research on this mental capacities is varied, multi-layered – and promising. Maybe we are on the way to a new, comprehensive, empirical and theoretical convincing theory of mind. Involved are humanities as well as sciences - most prominent: neuroscience - and computer science. Central research areas are for instance: a) Cognitive science - dealing with the cognitive dimension of mind; main issues are perception, memory, language acquisition and processing. b) Consciousness research - dealing with the 'soft' dimension of mind - affective, emotional, pre-reflexive; main issues are: intentionalism, mind-body-problem, subjectivity. - The need for philosophy? One option might be to offer a kind of integrative framework: theoretically consistent,
conceptually compatible, empirically plausible and open to new developments.
The present paper sketches the outline of current interdisciplinary progress concerning the topics cognition and consciousness. It formulates central conceptions and basic hypotheses - converging on various levels of description and analysis. For instance: the assumption of basic mental 'wholes' - 'mental models' - corresponding with the notion of representation. Important findings concern the growth, the 'format', the structure and the relations of these entities. The author relates these findings - maybe as constituents of a new, comprehensive theory of mind - to Whiteheadian basics, Whiteheads notion of essential entities and principles, of process and system. The central question: Is the processual system-theory possibly an adequate framework for current interdisciplinary research - conceptually compatible, empirically plausible and open to further developments?

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Process Philosophy and the Interfaces of Psychology and Psychodynamics

Abstract: There are two obvious ways to contrast psychology and psychodynamics: by epistemology and by differences in practice. These two approaches also involve overlaps.
Ellenberger (1970) has shown the long lineage of dynamic psychiatry, predating modern epistemology. Freud’s 1895 Project for a Scientific Psychology aimed to place his future work in a leading position within positivist-scientific neurology. His development left positivism behind, claiming its authority on a new understanding of behaviour based on observation in the clinic yet applicable universally.
Philosophers from Wittgenstein to Nagel and Wollheim have examined the relation of psychology to thinking, language and the concept of mind. Lacanian psychoanalysts have brought Hegel and Heidegger into theoretical formulation, while Deleuze and Guattari criticize the psychological anthropology that emerges from this.
My research in the philosophy of Paul Ricoeur with its many fields of reference has shown what I find a very interesting aspect of this criss-crossing debate: the implications of his study of the interfaces between psychology and psychodynamics in Book III of Freud and Philosophy (1970, pp. 344-375) and taken further in later articles and comments. Starting with epistemology and practice as criteria, he proceeds to the deeper principle that relates them. I believe this is the same principle that he applies to other dialogues and disputes we meet in his work. It belongs to the process of his thinking, and indeed springs from the very notion of process - something not noted by critics.

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Whitehead and the Psychology of Holotropic Breathwork

Abstract: Although Whitehead does not write about psychology directly, central concepts from his cosmology provide a basis for a psychology diverse from the mainstream, and his ideas have inspired the development of Process Psychotherapy. Mainstream psychology has developed under the rubric of the materialist program in science, and it suffers practical, epistemological, and metaphysical problems that trace directly to that program. Whitehead's critique of the materialist program in science and his concomitant cosmology offer solutions to the problems of mainstream psychology. This paper advances Whiteheadian approaches to address problems in three areas of mainstream psychology: consciousness, abnormal psychology, and therapeutics. The pioneering depth psychology work of psychiatrist Stanislav Grof in exploring the psychological importance of the human birth process and developing Holotropic Breathwork therapy is exemplary in Process respects for solving problems in these areas of mainstream psychology.
4.5 Education

Section heads: Robert Regnier
Adam Scarfe

Monday, July 3, morning
Room: HS 102

Session 1
“Process and the Rhythms of Education”

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A Fundamental Problem With Whitehead's Philosophy of Education

Abstract: In The Aims of Education and elsewhere Whitehead urges that education has two sides: An analytic side stressing languages (especially the language of mathematics) and an aesthetic side stressing immediate experience, Whitehead, a mathematician and physicist, has no problem explaining the analytic side. He pleads that it is necessary for the survival of any modern nation. The problem is that he does almost nothing to describe the aesthetic side. How are we to work it into a business or an engineering curriculum, realistically? This paper ends with a plea for help and some suggestions as to how the aesthetic side of education might be developed.

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The Place of Art in the Rhythm of an Education

Abstract: Whitehead’s well-known three stages of education are worth comparing to other aspects of his philosophy. The comparisons yield analogies that can be illuminating to both analogues. My essay explores the comparison between Precision, Romance, and Generalization in The Aims of Education and the civilized virtues of Truth, Beauty, and Art discussed in Adventures of Ideas. Precision and Truth have to do with well-ordered systems, with the careful correlation of symbols with what they symbolize. Precision offer a method for clarifying experience by imposing an unambiguous framework of interpretation upon the vaguely felt presence of the world around us. By learning how to think systematically, how to distinguish rationally between what is actually True from what seems to be true, we find meaning in our thoughts and a purpose to our actions. We fashion patterns of interdependence that orient us toward what is objectively important. Romance and
Beauty have to do with possibility, with ideals understood as novel patterns of relatedness available for concrete realization. Beauty is a feature of any achievement, but its importance for civilization lies in its power to overcome the limits of that achievement, its capacity to suggest alternatives to the stale values of the established order of things. Romance is the critic of Precision, carrying us beyond unquestioned limits, not only luring us back to the vague and poorly ordered experiences from which our clarifying truths are derived but also disclosing previously unrealized orderings, discarded or disreputable truths. Art and Generalization involve the insight and the wisdom needed to take these disruptive and disrespected aspects of experience and use them to transform the established features of what we think is meaningful. They are the skillful making of the new well-ordered systems that new conditions require, and their repeated exercise is how progress becomes possible, how civilizations can arise and be sustained over centuries, and how new civilizations can emerge from the ashes of the old.

An investigation of the relevance of what Whitehead means by Truth, Beauty, and Art for how educational programs should be structured shows that attention to educational practices that take Whitehead’s three stages seriously is crucial to the viability of our way of life as citizens in the global civilization now in the making.

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The Importance of Big Ideas, or How to Encourage Active Wisdom

Abstract: This talk will draw on the philosophy of Alfred North Whitehead and propose a whole new curriculum for higher education. Whitehead famously proposed that there is a three part rhythm to learning: romance, precision, and generalization. The proposal being developed here is that university education should be based on a careful examination of certain very broad generalizations such as all education is moral education and the current form of civilization is both unjust, and ecologically unsustainable.

Monday, July 3, afternoon
Room: HS 102
Session 2
“Educational Reform: East and West”

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The Rhythm of Education

Abstract: It is unclear to most readers whether Whitehead argues that there is an overall rhythm of education or that each process of learning and understanding involves a recurrence of the rhythm of education, i.e. of romance, precision and generalization.
I shall argue in this paper for the latter.

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The Implementation of the Theory of Creative Synthetic Learning Within the Chinese Education System

Abstract: At the Conference on Educational Reform in China, held in Claremont, California, I put forward "A Whiteheadian Theory of Creative Synthetic Learning" which subsequently was published in the volume Alfred North Whitehead on Learning and Education, edited by Franz Riffert. This theory was subsequently presented at several universities in China and is now being implemented on a trial basis by the Chinese Ministry of Education under the supervision of Professor Pei Dina from Beijing Normal University. The theory specifies the 2 fundamental aims of education as 1) the transfer into the present of the accumulated discoveries of the past, and 2) the development of talents and passion for new discoveries. It also enunciates the attributes of students that education should cultivate, including independence and integrity of thought, curiosity, and a bold spirit willing to examine and challenge prevailing presuppositions of thought. Creative synthetic learning is defined in reference to processes of “journeys of curiosity amid communities of problems which journeys are resolved in adventures of discovery and generalization of insights.” Teachers are viewed as guides and co-participants in such journeys. The journeys can be both individual and collective and educational systems must expose students to both forms of journeys. Research processes appropriate to the student’s interests, initiative and level of intellectual development must pervade the entire continuum of educational processes from inception to culmination. The development of synthetic and integrative modes of thought is essential to the capacity to attain generalizations of insight and wisdom. To this end the theory stresses that all problems exist within communities of related problems defined by adjusted variables and diverse environments. This is akin to Whitehead’s fundamental ontological principle that “no facts float in non-entity.” The over-emphasis upon and obsession with standardized tests stifles the curiosity, creativity and intuition upon which fresh discoveries depend. Within the Kingdom of Education, Curiosity must serve as Empress and Creativity as Emperor, if education is to instill in students the perception of the intrinsic value of learning and education is to contribute to the creative advance of human civilization. The experimental program in China to apply in a living way this Whiteheadian theory will be discussed and suggestions elicited and welcomed.
Moral Education with the Postmodernism as its Backdrop

Abstract: Postmodernism which takes the introspection and criticism of modernity as its mission, is a profound proposition inevitable to all aspects of social practice. Any country or nation, engaged, or to be engaged, in modernization should treat all the issues of modernism with a serious theoretical attitude and with an academic conscience responsible for the destiny of their own nations. They should be alert to the imminent crises caused by modernization and involve themselves in the search for remedy. This paper intends to analyze and introduce the moral education enlightened by the spirit of postmodernism and present a panorama of ethical and moral education against this background, for the sake of providing, on the basis of an evaluation of the merits and demerits of the postmodern moral education, some inspiration and implication for the present phase of moral education reform in China.

Some Implications of Whitehead’s ‘Deeper Faith’: Toward a Radical Educational Reform

Abstract: While there is an unwritten history to the emergence of "The Two Cultures Debate" in 1960s-1970s, there is little, if any, acknowledgement of Whitehead's most subtle concerns, especially on the motive for "seek-ing meaning and significance" and "understanding." Rhetorically, What do we "stand-under"? Or, in Pro-cess Thinking, What are we 'living-within'? I will pro-vide a summary review of the, first "debate" between T. H. Huxley and M. Arnold; a more extensive review of "The Two Cultures Debate" wherein the initial insights of Jacob Bronowski (as informed by his reading of Whitehead [although not formally identified by him in my formal "Science, Poetry and Species-Specificity: An Interview with J. Bronowski" ["The American Scholar, Summer, 1975]], as it were, left unacknowledged Whitehead's inspiration: not to be found in C. P. Snow or F. Leavis, (et al.). Yet, now, we face John Brockman's The Third Culture: Beyond the Scientific Revolution" (1995) and every expecta-tion that E.O. Wilson's life and thought, especially his "Consilience: The Unity of Knowledge" (1998) will ignite a "The Fourth Debate." I have kept in touch with Edward Wilson: he appreciates what he has understood about Whitehead (but not
necessarily what has been written by Process Scholars whether about Whitehead or about him). I will end my paper with a series of rhetorical questions: all suggesting that both "Interdisciplinary" and "Integrative" educational reforms, when they have "reclaimed 'human presence," need to be more radical: probing more deeply into, for instance, Wilson's testimony, "What else lay hidden deep within my soul?" (Naturalist, 1994, 46) Within Whitehead and, perhaps Wilson, there is an engaging "Fifth Debate."

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Emerging Possibilities in Urban Education: A Dialogue between Whitehead and Kanzeon

Abstract: This paper articulates an emerging theory of action for adult learners that is shaped by the cross currents of process thought, organizational and learning theories, and the wisdom tradition of Zen Buddhism as practiced in the White Plum Community, Kanzeon International. This paper uses concrete cases from an urban school district in Utah that embody a culture of commitment and manifest the deepest aspects of who we really are: limitless possibility, Big Mind/Big Heart. It offers both an experience and a reconceptualization of the self as global identity, transcending and including all diversity.

Tuesday, July 4, morning
Room: HS 102

Session 3
"Teaching and Learning in Higher Education"

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A Pluralistic University: William James and Higher Education

Abstract: The main focus of William James's criticism of higher education is the tendency of many academics to substitute abstractions, stereotypes, simulations, and oversimplifications for the specific details and problems of life. While James recognizes that general concepts are useful and necessary in daily life and lie at the heart of language itself, he notes that they may also be harmful in at least two main ways. First, they may fail to take into account subtle and often crucial aspects of problems, thus neglecting to address these problems in constructive, concrete, and meaningful ways, and second the intelligibility of certain kinds of abstraction
can sometimes be extremely narrow and confined only to the initiated few, i.e., understood or claimed to be understood solely by other academics with similar viewpoints and training. Implicit in the second point is the overspecialization of academic disciplines, which James considered to be a pernicious type of abstraction in itself. In its exclusive attention to what is special to a field, James argued, such fragmentation can cause university leaders and faculty to fail to recognize the complex interconnections of one field with other fields and with the concreteness of day-to-day experiences.

For James, this failure to recognize the complex interrelationships of a discipline with daily experience thwarts the university's highest mission: the cultivation of the whole person as a distinctive moral individual in a diverse world. The whole person knows not only how to make critical judgments about significant issues, but also how to recognize traits that characterize a virtuous individual. Knowing how to recognize a virtuous human being is especially important, argues James, in a democratic society where the educated must elect their own leaders and assume leadership themselves. To accomplish the task of recognizing "human excellence," colleges and universities should teach subjects, such as geography and literature, in their historical and biographical context.

The purpose of this paper is to show how James’s metaphysical pluralism and perspectivism are central to his critical assessment of higher education in his day. More specifically, it examines James’s ideas on the uses and misuses of abstractions and the bearing these ideas had on his philosophy of higher education. For James, a superior education is one that teaches students to think constructively and critically and to live morally. This education cannot be accomplished if the university becomes solely a technical or professional school.

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Whitehead’s Thoughts about Teaching and the Way of the Liberal Education

Abstract: The actual crisis in European educational systems was depicted by Hanna Arendt in a very famous paper concerning the United States in the 1960’s. Of course Whitehead could not be aware of the importance of the shifting in contemporary teaching and learning. Like Arendt, his own education was impressed with the ideals and the aims of liberal education. Now we would like to show, from the outlook of process philosophy, that a different relationship between past, present and future entails a discrepancy concerning the relevance of the traditional way of schooling between both of these thinkers. So we hope to promote a better knowledge of Whitehedian educational philosophy, curiously absent nowadays through all the controversies related to this topic.
Learning as Valuing: A Whiteheadian Perspective

Abstract: Not only does Whiteheadian education seek to achieve "an appreciation of the infinite variety of vivid values achieved by an organism in its proper environment," it can be argued that the creative processes core to Whitehead's rhythmic learning are fundamentally processes of valuation. In Science and the Modern World, Whitehead criticizes how assumptions about the valuelessness of nature that lead to lack of reverence for natural or artistic beauty undermines the achievement of value in education. He argues for recognition of the aesthetic dimensions of learning in discussion of how "art is the habit of enjoying vivid values" and calling for the restoration of aesthetics to achieve balanced education. In Religion in the Making, he analyzes "value as inherent in actuality itself" and "enjoyment as the experiencing of value;" and in Process and Reality Whitehead refers to valuation in his explication of concrescence. This paper is an inquiry into learning as valuing that reviews Whitehead's distinctive understanding of the notion of value, how value emerges within his cosmology, and how the notion of learning as valuing can be the basis of a revised critical pedagogy.

Education as Process: Why Engaging the Whole Person Is Important and How to Do It

Abstract: Part One: The largest goal of teaching is to "grow persons". Learning is a life-altering process, in which the whole person changes, for better or worse. The whole-person student is personally (not just, "intellectually") engaged with the learning process, and thus has all of his resources and energy available for the tasks of learning, and is the most likely to put the results to the true benefit of civilization. Education is optimal for both the student and the culture when all of the student's (and teacher's) creative resources are enlisted together. This is why "engagement" is important.

Part Two: I present a detailed "teacher’s" narrative of my own five-stage process, showing how engagement can be created, step by step. I also exemplify Whitehead’s stages of romance, precision, and generalization. The basic idea is: first, I make an immediate assignment to find/ create "your own" views in a task or project (appropriate to the course subject), due a week or so later. Second, I then have them each compare their own results with a peer's. Third, we all reflect together on what we’ve learned (about both the subject and learning itself). Fourth, I invite each of them to use the rest of the course as an opportunity and aid in gradually developing
their own personal, yet publicly defensible, view of the course subject. Students frequently tell me this approach has been “life-changing” for them. This process could be adapted or abbreviated for a wide range of courses and purposes.

Part Three: From reflecting on my own struggles to become a better teacher, I make recommendations under a number of headings. 1. Credencing feelings and concrete individuality; 2. Authenticity, mutuality, and trust; 3. Leading responsibly and responsively; 4. Respecting limits and cherishing achievements; 5. Facilitating drama and zest; 6. Adapting to other disciplines and personalities; 7. Proper motivation and reward; 8. Relevance and protecting vulnerability. Ultimately, we must learn all this by doing it, and adapt to each different situational nexus, so my readers should “eat the meat and throw away the bones”.

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Evaluating University Teaching Means Evaluating Student Learning: A Whiteheadian Perspective

Abstract: My paper examines the views of faculty members and students about student evaluations of teaching (SETs). Through the use of a qualitative methodology that avoids the fallacy of misplaced concreteness, and in conjunction with the voluminous literature about SETs, I draw several conclusions about their limitations. These focus on the extent to which such evaluations strengthen the ideology of “students as customers,” and the ways in which this tendency undermines the goals of education. I conclude by proposing alternative forms of evaluation in keeping with a Whiteheadian philosophy of education.

Tuesday, July 4, afternoon
Room: HS 102
Session 4
“Experience, Education, and Speculative Philosophy”

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Educating the Five-Minded Animal

Abstract: Whitehead’s universe is a fractal universe, though the language of fractal geometry had not yet developed to allow him to describe it in
this way. The three phases of development from infancy to maturity replicate the oscillation between the physical and mental poles in each moment of creative experience – physical sensation, mental observation and the imaginative leap that connects them. They are replicated in each experience of transformative learning, instantly in a moment of insight which shapes our behaviour, or extended over time in life-changing events. There is some evidence from a number of sources that they are also replicated on a larger scale – in the experiences of the species. Whitehead’s thinking in this regard runs parallel to that of a number of thinkers who have distinguished different ways of experiencing the universe. However, where Whitehead distinguishes between the physical and mental pole of each moment of experience, others have presented more complex models based on evidence from the history of consciousness, developmental psychology and neuroscience.

This paper borrows the expression ‘the five-minded animal’ from Kieran Egan. However a more thorough and more complex exploration of this notion is to be found to be found in the work of Jean Gebser. Gebser’s notion of ‘structures of consciousness’ provides a framework for looking at the process of education as it involves the physical pole of experience, the mental pole and the gradations between.

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The Human Body as a Companion for Education: The Withness of the Body

Abstract: I propose here to analyze how the withness of the body as developed in PR (passim, notably pp.311-312) modifies in depth the presentation of Whitehead's educational theory, in order to integrate it into a general cosmology. I shall also mention his later works, namely Adventures of Ideas and Modes of Thought, which apply this cosmology to the specific domains of human activity.

Such a conception of the withness of the body rests, Whitehead tells us (PR, 65-70), on two principles, namely, on the principle of limitation of the current events by the effectively given, and the (converse) principle of an extensive scheme according to which this limitation becomes effective. Each human body illustrates at the same moment this limitation of the given and its general frame.

It is exactly this conception which we shall find in Adventures of Ideas, where Whitehead describes the diffuse presence of the human body in the work of art. An artwork could be defined as an expression, in and through the common space, of feelings limited to an individualized point of view or perspective on the world. It is through the body that we feel such a limitation in its depth, and we express it in and by the work of art. To adopt the later terminology of Modes of Thought, the body is the place of an interplay between the importance of the world and its particular expression, when the human being is experiencing the importance of the world.

Having this scheme in mind, we could re-interpret Whitehead's model of education, as found in The Aims of Education. Everything can be subject to education, because everything is subject to expression. The real educational opportunity will be one that best respects the physical rhythms of education, and is one in which the body plays an irreplaceable role in the very process of giving the importance of the world its appropriate expression, as shown by the phenomenological analysis of another
philosopher, namely M. Merleau-Ponty.
The major consequence for education is that it is itself a process with a
double phase: a phase of interiorization and a phase of public display
without which we would never get any real appropriation of the values there
conveyed by a global society.

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Whitehead's Prehending and Dewey's Experimenting: Speculative Philosophy
vs. Educational Theory in Twentieth Century One-Room Schoolhouses

Abstract: In 1898, 98% of North Dakota's schools were one room school
houses, with an average of 15 students per school. In 2006, North Dakota
has 5 one-room schools remaining, with a total enrollment of 40 or an
average enrollment of 8. These rural schools remain open at the insistence
of the parents, who believe that their children are receiving an excellent
education. The twentieth century one-room schoolhouse can be seen as a
place to consider whether a pedagogy unencumbered by the burdens of mass
schooling approximates the ideals of various educational theorists.
One-room school houses have several characteristics in common, among them a
richly integrated curriculum and the commonly held sense of belonging.
Whitehead tells us that "The connexity of existence is the essence of
understanding"; Dewey concurs: "Meaningful knowledge," he says, must be
constructed under vital conditions of experience which require us to hunt
for connections." (In other respects, these philosophers do not always
agree.)

My questions are: how, if at all, do the special circumstances of the one-
room school house (isolation, small enrollments, community support)
facilitate these connections? And when we consider this actual learning
setting in terms of various theoretical ideals, how do those ideals compare
and contrast?

This paper will have 3 sections. In the first, I will give a brief
description of the one-room schoolhouse of a century ago and the one-room
schoolhouse of today. In the second I will define Whitehead's theory of
existence as a series of prehensions (Process and Reality); Whitehead's
theory of learning as concrete apprehension (Aims of Education); and
Dewey's theory that cognition is developed as a result of testing
hypotheses (Experience and Education). Finally I will conclude by
discussing whether, using this unique situation as a backdrop, these three
large and influential theories are at all operationally disparate.

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**Prehensive Selectivity and Academic Research (with Reference to Learning)**

**Abstract:** This paper draws from a related article, “Prehensive Selectivity and the Learning Process,” in Riffert, F. (ed.), et al. Alfred North Whitehead on Learning and Education: Theory and Application, which provides a systematic elaboration of Whitehead’s theory of prehensions in relation to learning processes. By applying Whitehead’s descriptions of the processes of valuation, which are at work in human experience via the interplay of positive and negative prehensions, to higher education, this presentation addresses a controversial issue, namely, the selective processes surrounding academic research.

Making a distinction between ‘internal-private-subjective’ and ‘external-public-superjective’ selectivity with respect to academic research, I shall first provide a critical analysis of the ‘internal’ processes of valuation and selection of the ‘curricula’ or the ‘content’ of research by individual scholars, as the ‘prehending subjects’ of research possibilities. Second, I shall apply Whitehead’s categories to issues pertaining to the ‘external’ assessment and evaluation of research and research programs. On the one hand, I take issue with the dominance of forms of academic research which are selected and carried out on the basis of the potential monetary and instrumental value of their applications. Especially, I provide a critique of the hegemony of research programs which: 1.) are primarily ‘money-driven’ rather than ‘curiosity-based’, 2.) are not focused on the promotion of life and the ‘art of life’, and 3.) through their reductionism, overstate the division of the extensive continuum, thereby neglecting relatedness and committing the fallacy of misplaced concreteness. In turn, I try to show the importance of considerations of aesthetic and intrinsic value in selecting and carrying out academic research, in order to re-balance the contemporary state-of-affairs in higher education. On the other hand, I raise similar questions surrounding ‘external’ selection processes concerning research, such as the ‘Research Selectivity’ exercises in the U.K., which have been employed for the purpose of discriminating between ‘higher-order’ and ‘lower-order’ research, thereby according resources to the more ‘reputable’ institutions, departments, research programs and centres, and eliminating the ‘lower’ ones from funding.

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**Abstract:** First a short overview is given about the actual situation of national and international standardized testing. Then the two major reasons are presented why standardized testing has become so wide spread: (1) the missing reliability of teachers’ assessment of students’ achievement and (2) the important role standardized testing plays for out-put management in educational systems.

At the background of this outline Alfred North Whitehead’s critical remarks on external standardized testing are presented. Whitehead’s main point is that standardized external testing limits the freedom of teachers to adapt to the complex, situation specific circumstances in order to obtain the maximum of a creative learning process for students who are conceived as “specialists”. Instead external testings lead to “teaching to the test” and the cramming of test-relevant contents. As a consequence, the attitude of creative, adventurous exploration is killed and subsituted by simple
pattern recognition, narrow visions, and even boredom. Finally the question is raised if there is any possibility to develop a measurement tool which on the one side meets scientific test criteria, and on the other side still is flexible enough to be adapted to needs of single schools - according to Whitehead the essential educational unit - and not vice versa, as it is the case at present with external standardized testing. That such a flexible approach to evaluation is possible is demonstrated by the presentation of the basic ideas of the MSS (Module Approach to School Development Projects) which was developed and examined so far in 10 schools by the author and his collaborator at the University of Salzburg. Just recently the MSS was developed into an online-evaluation tool.

Wednesday, July 5, morning  
Room: HS 102  

Session 5  
“Process, Curriculum, and Application”  

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Education as a Process: Reflections on Whitehead's The Aims of Education  

Abstract: My presentation focuses on education as a process in Whitehead's seminal book, The Aims of Education. For Whitehead education must keep knowledge alive, that is, from becoming inert. How is this done? The teacher must evoke curiosity, interest, and good judgment. There are no set formulae for achieving these objectives, because we are dealing with the human mind, rather than with dead matter. Successful teachers know in their own minds what students must know. Whitehead sees education as a process rather than a product. His view of education was totally at loggerheads with those of his own day who believed that students' heads must be crammed with facts or "throwaway knowledge," i.e., matter to be digested for an exam and then thrown away. Whitehead held that the best teachers are creative or imaginative. (Imagination understood as a way of illuminating the facts.) This can only be achieved by faculty who wear their learning with imagination. Knowledge does not keep any better than fish. It must come across to the students as just drawn out of the sea and with the freshness of its immediate importance. Whitehead's ideas on education go hand in glove with the "critical thinking" movement in education, particularly with the emphasis on "active learning," where students do something in addition to listening to the teacher. Active learning puts a premium on the development of higher order thinking skills such as analysis, synthesis, and evaluation. Active learning makes the teacher a catalyst for "learning" which means watching the open pages of all the books one has ever read and when the occasions warrants, selecting the right page to read to the universe.
Whitehead's Philosophy as a Basis for a Conceptual Framework in a Teacher Education Program

Abstract: This paper describes the Teacher Education program at Kentucky Wesleyan College and how Whitehead's Philosophy has served as a basis for the Conceptual Framework. The theoretical underpinnings of the Framework are discussed and examples of how the Whiteheadian Framework is "fleshed-out" in actual practice are described. Strengths and weaknesses of the KWC framework are discussed. The Education faculty at KWC view themselves more as applied Whiteheadian practitioners than as Whiteheadian philosophers. This paper deals with putting the ideas associated with process in action in a concrete situation. KWC has maintained the Whiteheadian Framework for nearly two decades. Useability of the Framework will be discussed and recommendations for improvements will be suggested.

Mindell’s Process Paradigm in the Marketing Classroom

Abstract: "Encouraging clients to follow only one part of themselves is always less useful than helping them contact all their parts. Only the total process is really healing. Following a client in process oriented psychology means not only following the part which the client identifies with in the moment, but following the total process, that is, with both the primary and secondary signals." In light of the aforementioned quote from Mindell (1988), we examine how university students register for marketing subjects to learn how to sell goods and services to earn a living and yet sink further into debt in line with the society around them. We encourage marketing educators to look beyond students’ narrow interest in marketing theory and address the students’ aspirations to accumulate wealth by positioning marketing as a total process for lifelong prosperity. Such process paradigm approach is warranted by troubling economic statistics. The current savings rate in the United States is around zero and credit card borrowing is at record highs. According to Nellie Mae, "Graduate students... carry higher credit card balances than others in the general population, and are less likely to pay their balances in full each month... Graduate business students accumulate... an average balance of $11,585." USA Today headed its October 4, 2004, edition with the following lengthy title "$84,454 is the average household’s personal debt. $473,456 is the average household’s share of government debt, including Medicare and Social Security. The government isn’t asking you to pay it. Yet." Two weeks earlier, in Canada, CBC News Online stated that "In 2003, for the first..."
time ever, the average Canadian household owed more than its annual take-home pay... Students are often graduating with accumulated debts of $25,000 or more. Consumer debt levels are rising much faster than incomes”. Students are an integral part of the society around them and a consumption-oriented society promotes a consumption-oriented lifestyle. Rather than treating debt as an experience beyond the reach of the classroom, marketing educators need to take corrective action. We owe it to our students to groom them with a healthy financial attitude by following the total process rather than treat their registration for marketing courses as a mere part on the way to graduation.

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Steps to a Process Curriculum

Abstract: Presenting a strategy and tactic to revitalize pedagogical methodology and to displace traditional curriculum design. All teaching and learning are formativer processes. The tactic is identified as "contextual perceiving." Delineated first are criteria for recognizing humanity's three perceptual contexts. Then the Epigenetic Learning Hierarchy in which the concepts of Motion, Process, Structure, and Symbolics are related by means of a synthesizing evolutionary tetrahedronal model. There is then differentiated Extracted information from Abstracted information. Finally, there is offered a tentative outline of the AEIOU ecologically based curriculum approach -- in a "classical" format organized around the concepts of Water, Earth, Air, and Fire.
Leadership: A Different Theoretical Approach

Abstract: Much leadership study is characterised by hyperbole and normative speculation about the essential self as the centre of individual agency and self-discipline (objective or enlightenment-subject); or else the external other produced by institutional standards of normality and entitlement (rationalised or normalised-subject); Contemprary research does now examine the leadership role as a centre of social influence and identity-seeking interpersonal exchange (relative or liberal-subject); or, more critically, as a system of interdependencies (identity-politics; tolerances) without a sovereign agent (interactive or cosmopolitan-subject). Extending from this latter approach the paper will acknowledge the inevitable indeterminacy of leadership behaviour and develop a process philosophical perspective that is more sensitive to leadership as a unified relation that refuses to essentialise identity or exogenous relations as a foundation and is invoked more as a difference-in-itself (shared or relational subject).

A. N. Whitehead: Rationality and the Social Progress

Abstract: In this article I intend to analyze the relationship between theoretical reason and practical reason from a whiteheadian point of view, because I consider that nowadays there is a tendency to give priority to practical reason which only focuses on the most urgent and basic problems. This position is, defended by authors (like Rorty) which try to reduce or even suppress the speculative function of Reason, refusing to use terms such as ‘truth’, ‘reality’, ‘objectivity’, ‘knowledge’, notions on which our occidental civilization was built. In this sense, Whitehead believes in the necessity to recuperate the value of theoretical reason due to its direct relation with social progress. This topic is especially developed by him in the text ‘The function of Reason’ published in 1929. According to Whitehead, the speculative thought (theoretical reason) -
defined by him approximately as a Reason based above the praxis of life looking for a unified understanding of the world and of life with uninterested curiosity-, is the decisive factor for social progress, despite of its unavoidable abstract character. Theoretical reason does not always produce immediate changes in social life; however, its development depends directly on the importance given to this aspect of reason. I judge opportune to stress this whiteheadian reflection due to the alarming process of universalization of practical and instrumental reason. The unusual widening of the domain of practical reason has led some philosophers to try intentionally, to turn the philosophical research more 'superficial', becoming themselves indifferent to the truth and starting a rebellion against the philosophical impulse which is perceived as humiliating and deprived of realism.

Practical reason plays, undoubtedly, an important role in human life because it guides our activities in the world; but the problem is that it has progressively become omnipresent invading all the interstices of life and its harmful consequences have become evident to the sight of the most ingenious person. In this context, I try to rehabilitate Whitehead’s ideas who, following the old Greek ideal of wisdom, points out emphatically the value of theoretical or speculative reason which has as an only purpose the search for truth by the truth itself, since man does not only live on bread. Hence, the article travels round the Whitehedian’s position towards nature and the value of the Speculative thought (Theoretical Reason); and its basic importance for the comprehension of social development.

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Management Thought and Coming Civilization

Abstract: The civilization of 20th century was founded by corporate activities after the industrial revolution. Automobiles and computers would show the typical examples. The representative management thought was Scientific Management System introduced by F. W. Taylor. In the period after World War I the philosophy of Alfred N. Whitehead gave an influence to management thought developing at Harvard University and its surrounding areas. However, the influence of Whitehead could not continue after World War II. The main stream of management thought in the century was not based upon the view of organism but economic man. Those problems such as environment, conflicts between cultures and humanity we face now are the legacy of 20th management thought. Information Technology and Globalization of business, competitive market will bring the coming civilization of 21st century. However, for this coming civilization we do not have any philosophy, and so do not have any new management thought to solve those problems. We would like to try to develop a new research for management thought, based on Process Thought and Narratology.

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Whitehead and Keynes: Process Philosophy as a Foundation for Political Economy

Abstract: Whitehead’s process philosophy has important implications for political economy. Whitehead himself pointed to some of these, most explicitly in two essays originally delivered as lectures at the Harvard Business School: “The Study of the Past: Its Uses and Its Dangers” (published in Essays in Science and Philosophy) and “Foresight” (published as chap. VI in Adventures of Ideas).

The ontological ideas that constitute this philosophy had already found expression in political economy before Whitehead, most obviously in Marx as a result of Marx’s appropriation of the tradition in philosophy stretching from the Greeks through to Kant and Hegel. Though the only explicit remark Whitehead makes about Marx’s political economy is dismissive (Whitehead 1933, p. 42), in Adventures of Ideas he also makes a very insightful and positive indirect reference to it, pointing to the consistency of key aspects of its approach to history with his own by crediting “the economic interpretation of history” with the insight that the “essence of freedom is the practicability of purpose” (ibid., pp. 73-4).

There is, however, another very important tradition in political economy that appropriates these ideas, the tradition in Cambridge originated by Alfred Marshall and further developed by Marshall’s student, John Maynard Keynes. In the case of Marshall, the main sources are German idealism (in the preface to his major theoretical work, the Principles of Economics, Marshall points to Hegel’s Philosophy of History as representative of one of “two kinds of influences” that “have affected, more than any other, the substance of the views expressed in the present book” (Marshall 1961, vol. 1, p. ix)) and, though Marshall hardly ever explicitly acknowledges him, Marx. In the case of Keynes, there is, in addition to the influence coming from Marshall, evidence of direct influence from Whitehead. Keynes was a student of both Marshall and Whitehead. In fact, Whitehead once joined Keynes’s name with Bertrand Russell’s as instances of his “best pupils”.

The paper will explore the implications of Whitehead’s process philosophy for political economy by way of an examination of the role the ideas constituting it play in Keynes’s political economy. Particular attention will be paid to the idea of “internal relations”. This idea underpins Keynes’s conception of the methods appropriate in economics, in particular his rejection of “physics” as an appropriate model for reasoning in the “moral sciences”.

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Alfred N. Whitehead's "here and now" and it’s Application to Management Theory

Abstract: In Harvard Business School in 1930s, the Scientific Community was formed and the new movement of Management Theory was begun. The movement was to construct the science of human cooperation.

Alfred N. Whitehead’s Lowell Lecture “Science and the Modern World,” especially his “here and now” profoundly influenced the movement.

In my study, I clarify Alfred Whitehead’s influence on L. J. Henderson, a
physiologist who recruited Alfred Whitehead, W. B. Donham, the second Dean of HBS, C. I. Barnard, the founder of Modern Management Theory, and T. North Whitehead, Alfred’s son. My focal point is to construct a conceptual scheme based on the “here and now” in Management Theory.

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Towards the Whiteheadian Organization: Gebits and/or Event Fields?

Abstract: Process physics (Cahill, 2005; Eastman and Keeton, 2003, Griffin, 1998, 1996) is, like all physics, a model of reality. However, unlike traditional substance-based versions, process physics implements many process philosophical concepts, perhaps most notably, the notion of internal relations. It argues that the universe can best be understood in terms of self-referential semantic information that is remarkably similar to mathematical stochastic neural networks research in biology. It argues that information patterns generate new information through causal efficacy and, ultimately internal integration, generating self-organising patterns of relationships that have an intrinsic value inherent in their self-actualisation and which thereby experience a subjective unity in response to influences from the totality of their past. The result is an internally related self-organising stream of experiences that provides a defining essence objectively distinguishable in abstraction (Dibben and Smallman, 2005) and as exhibiting all the characteristics of a quantum space and quantum matter. In process physics, therefore, quantum phenomena emerge where no prior assumption regarding their existence is made or prescribed at the start, but rather where they are internally generated as an inherent feature of an experientially becoming reality, growing in size over time and thus having an observable key feature – i.e. a ‘defining essence’ – of an expanding universe. Reality itself is now understood – and modelled – as having a primitive form of self awareness, i.e. prehensions of other actualities as objects in terms of their provocation of some special activity within the subject (Whitehead, 1933/1961: 176) and which, in more biologically complex information systems, ultimately leads to experiential integration as conscious discrimination of contrasts in prior experiences. Reality is, ultimately, not about the identification of isolated individuals through externality, but related individuals through internality. The purpose of this paper is to apply these principles to the social sciences by asking whether and to what extent they might help explain organisations as event fields (Bracken 1989, 2003), within which persons-in-communities (Cobb, 2006) reside.
Chinese Marxism and Whitehead's Philosophy

This paper will discuss the general similarities between 1) Chinese Marxism with its emphasis upon the major relationships needed for a harmonious, sustainable and continuously progressive development of human society, and 2) the philosophy of organism and process as developed by Alfred North Whitehead. Underlying similarities between Marxism as developed in China and Whitehead's philosophies will be discussed regarding: a) the relationship between undivided interests (values) and the interests of society as a whole and b) the concept of the liberated and more fully developed human being.

Just as Whitehead opposed the bifurcation of reality into mental and material realms, so too, Whitehead's philosophy opposes the bifurcation of 1) theology and spirituality, and 2) issues of social justice. The severe tension and counter-productivity of erecting walls of separation and antagonism versus building bridges of cooperation and mutual benefit in respect to the world's religions and progressive social movements will be discussed in reference to the historic conditions from which Marxism was transformed from an abstract ideology to a powerful political movement operating in human history. Whether and how previous historic antagonism and contradictions between religious traditions and a progressive social movement like Marxism for social and economic justice can be overcome will be explored.

We will also explore the important relationship between the Marxist view of social reality and Whitehead's fundamental view of the interconnections and independencies that exist within the flux of events. Whitehead's fundamental ontological principle that the Many creates the One and the One yields to the Many that constitute the One's Causal Future will be discussed in the context of Marxism's view of the social fabric. As Marxism holds, the individual cannot be understood in abstraction from his or her social relationships. Whitehead's metaphysics holds that no concrete entity can be understood in abstraction from its relationships with the broader environment.

Issues of social and economic justice and issues of liberation are issues that concern relationships among entities that cannot be considered as independent atoms but must be seen from an organic perspective of reality. Certain contradictions between theory and practice in respect to contemporary capitalism and socialism will be discussed from the framework of Whitehead's philosophy of organism.

The contrasts between disjunctive vs. integrative models of social and
economic and ecological development will be defined and discussed within the broad context of Whitehead’s metaphysics.

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Libertarian Socialism, Anarchism, and Process Thought

Abstract: This paper explores the thought of such Hungarian libertarian socialists as Jeno Schmitt, a follower of Tolstoy, in the late nineteenth century; Ervin Szabo, an anarcho-syndicalist in the first two decades of the twentieth who was the first to translate the works of Karl Marx into Hungarian; and in the middle of the twentieth century, the thought of Istvan Bibo, which has a great deal of affinity with process thought. The plausibility of relating the thought of each thinker to process thought will be examined. Since all of the Hungarian thinkers deal almost exclusively with human affairs, the issue of how process thought might extend the area of their concern to the non-human natural world will also be analyzed.

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Balancing Individuality and Community: Political/Economic Thought of John Adams and Adam Smith

Abstract: Fundamental misinterpretation of the thought of John Adams and the thought of Adam Smith has contributed to excessive individualism in the U.S. especially, but also in other societies. Such extreme individualism comes at the expense of community. To read either Adams or Smith as advocates of extreme individualism is to commit the historical crime of anachronism. Both Adams’s quest for liberty and Smith’s emphasis on the free market took place within a community context. Their thought balanced individuality and community. Cobb’s concept of “person-in-community” would be one way to characterize that context.

Adam Smith’s carefully balanced thought has been polarized; he is often cast as an advocate of rugged individualism. One example of this polarization is the gross misinterpretation of Smith as a strong advocate of laissez-faire. The rugged individualist’s interpretation of Smith is that the individual should be able to pursue his/her self-interest without governmental intervention. But Smith never used the term laissez-faire. In fact, because of his concern for justice, which he defined as fair play, his books include significant qualifications of individual initiative and a more significant role for the government than laissez-faire advocates recognize.

John Adams has been misinterpreted on the question of aristocracy vs. democracy for over 200 years. He has been criticized for being a democracy apostate. The “Atlas of American Independence” supposedly became an aristocrat. Adams did not change. His critics could not accept his
argument, based on his omnivorous reading of history going back to the Greeks and Romans, that the revolutionary ideal of equality would be destroyed by the inevitable ascension to power of elites, the aristocrats. The message was unacceptable so the messenger was rejected. Adams understood something which Robert Michels “discovered” almost two centuries later: “The Iron Law of Oligarchy.” Adams wanted a system that would balance the democracy (the masses) and aristocracy (the elites). In short, he wanted a system which would respect the rights of all citizens through democratic community processes.

Sub-section: Marxism

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Legitimacy in Process Perspective

Abstract: In Western history authority has generally received legitimacy through religion. In Christendom the Popes crowned the emperors. The Reformation weakened this tradition. One result was the doctrine of the divine right of kings that retained the religious basis of legitimacy but excluded the church. The other was the idea of a contract escaping the anarchic state of nature by giving authority to government. A Whiteheadian view sees the state of nature as community and derives the legitimacy of government from its service of community.

5

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A Philosophical Reflection of Process and Process Thought

Abstract: This paper expressed author’s philosophical reflection to process and process thought based on his understanding to Karl Marx’s process thought and Alfred North Whitehead’s process thought. White’s process thought is mainly expressed in his theory of cosmology as understood in his book Process and Reality. He also asked to pay very close attentions to the matters and events. Karl Marx’s process thought mainly related with the process of development of natural world, human history, and people’s life. He especially insisted the progressive direction of the world and human life. However, there are many common points between Karl Marx and Whitehead. According to the reading of their books and the understanding to their ideas, author would like to give some philosophical thinks to process and process thought from following aspects.
1. The nature of process is the existence of matters or events in the temporal movement. The main reference and the main methodology to understand process is temporal methodology. Though temporal methodology is not new in the history, but it has been used so broadly in the contemporary sciences, technology and social area. It means the importance of process thought as an existence in the temporal situation.
2, Processes are always concrete. Different processes have different subjects, such as matter, spirit, people or social event, and different environment, so different process have different moving status. The research to philosophy of process should pay the attentions to the different status of process.

3, Process is a kind movement with its own developing direction. There are mainly three statues of process: progress, stagnation or retrogress. One of the main tasks of process studies is to find, explain and evaluate the direction of process.

4, The basic motivation of process is the inner contradiction of matter or event. The different kinds of contradiction prompts the movement of process and changes its development direction.

5, Value is the most important elements in the process thought. Value conflict and value choices influences the developing direction of process, or changes the direction of the process thought.

6, Evolution is the main direction and the main characteristic of life, human being and social world.

7, Process study is actually a kind of complex studies. Both complex idea and complex research methodology are very important to a rational and effective study to process and process thought.

Tuesday, July 4, afternoon
Room: HS 109

Session 2

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Whiteheadian vs. Straussian Political Philosophy

Abstract: I discuss Shadia Drury's interpretation of Strauss (in terms of Nietzsche), which I take to be basically accurate. I then discuss the harmful effects of accepting such a political philosophy, with reference to the possibility that this view has shaped the attitudes of some members of the Bush-Cheney administration. I then sketch a Whiteheadian political theory, suggesting that it would be more salutary as well as more in harmony with reality. The key issue is whether moral values belong to the fabric of the universe. This difference leads to difference on many other matters, such as whether might makes right and whether politicians must conceal their true beliefs.

7
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Whiteheadian Process Thought and Public Policy: Depolarization for Network Coalescence

Abstract: Policy roles for Whiteheadian thought are perhaps twofold, the success of the latter depending on the former. (1) Its general polarity method indicates a potential to develop a policy method of depolarization of ideologized concepts and communities, facilitating coalescence of polarized policy networks in various issue areas. (2) Its trans-disciplinary scope enables it to explain the Right-to-Left expanding manifold of policy interests, lending credence to attempts to enfold movements of un-enfranchised stakeholders within mainstream policy networks.
Earth Jurisprudence

Abstract: Humans for the first time are experiencing natural limitations on a global scale. There is a need to establish an ecological basis for law. The process philosophy of Alfred North Whitehead and the work of Thomas Berry on the Origin, Differentiation and Role of Rights provide a starting point for a new Earth Jurisprudence. Berry states: Rights originate where existence originates. That which determines existence determines rights. The universe is self-referent in its being and self-normative in its activities. It is also the primary referent in the being and the activities of all derivative modes of being. The universe is a communion of subjects, not a collection of objects. As subjects, the component members of the universe are capable of having rights. Every component of the Earth community has three rights: the right to be, the right to habitat, and the right and correlative responsibility to fulfill its role in the ever-renewing processes of the Earth community. In doing so, Berry appeals to a cosmological basis for rights. This paper reflects on Whitehead’s cosmology and how it does or does not support Berry’s enumeration of principles on which law should be based. The paper also includes a discussion of the “rights” theory as a basis for Earth Jurisprudence and concludes with a discussion of the new Earth Jurisprudence Center, the first of its kind, currently being established as a joint collaboration of the law schools of St. Thomas University and Barry University in Florida.
Abstract: This paper addresses the issue whether human society, already integrated across the ultimate, maximum area of Earth’s surface, can overcome the global environmental problems. I will analyze the issue from the perspectives of politics, economics and culture and focus, in particular on the adequacy of the Western European roots of the present globalized society. I will also use Alfred North Whitehead’s philosophy of organism for illumination of the problems and solutions. The global environmental situation presents the most widespread, common and serious challenges facing international community and civilization, challenges so great that they put the continuation of civilization in question. Though we have entered the 21st century, there is no sign that the environmental problems will be solved. The reports published recently by the UN Environment Programme and the Intergovernmental Panel for Climate Change point out that the situation has been worsening, and has been approaching the critical point forecast in “Limits To Growth” in 1972. With the advancement and development of information technology, economic globalization has rapidly progressed since the 1990s and now spans the entire Earth. Five years into the 21st century, we can say the capitalist system of market economy has been globalized and even includes China whose economy is referred to nominally as a socialist market economy. The political, economic and social systems controlling this new world are fundamentally based on the political and economic ideas originated in Western Europe. To say that we today are living, so to speak, in an age when Europe has become the world is not an exaggeration. This trend of globalization of the capitalist economy as the sole economic system involves all of the world’s countries that have differing histories and cultures. They consist of: (i) the advanced countries of Western Europe and advanced non-Western Europe countries that have attained a similar level of development, (ii) developing countries, and (iii) less-developed countries which suffer from poverty and population explosion. In all of these diverse countries, because of the restrictions caused by global environmental problems and the constraints of the accelerated pace of economic globalization, antagonism among different interests has become so intense that sustainable growth has reached its limits. The power and the effectiveness of market economy system grounded on the modern democracy and capitalism deriving from Western European civilization has significantly contributed to the development of human society. However, at the same time, despite their contributions, the modern democracy and the capitalist system are today confronted with economic globalization problems and global environmental problems that contradict the value system that lies at the profound root of Western European civilization.
Are Democratic Rights Human Rights?

Abstract: This paper seeks relevance to legal theory by asking whether democratic rights, specifically, those rights properly stipulated by a democratic constitution, are also rights constitutive of our sheer humanity. The discussion begins with Whitehead’s comments regarding “the humanitarian ideal” and the threat to it posed by “several strands” of modern thought, especially moral theories on which the ideal for humans requires “no ultimate understanding of their relation to the rest of things” (Adventures of Ideas: 28, 37-38). Moving through Kantian examples of such theories, the paper is focused on the nonmetaphysical alternative characteristic of post-Enlightenment thought and, specifically, a discussion with Jeffrey Stout’s Democracy and Tradition. Stout’s proposal that democracy is a discursive social practice properly seen as secularized but not secularistic is, the paper argues, compelling. But his account of democracy denies, at least by implication, that democratic rights are human rights because his conception of democracy as a tradition depends on a kind of “specific pragmatism” and thus excludes a necessary moral principle. Specific pragmatism, I further argue, cannot provide a coherent account of democratic rights, so that adequate backing for the compelling aspects of Stout’s proposal requires metaphysical pragmatism. Returning to Kantian theories, the paper argues that metaphysical pragmatism requires, against them, a comprehensive good. Hence, democratic rights not only must be human rights but also lose “their security of intellectual justification” without a backing through which they are related “to the rest of things.”

Responders:

Mark C. Modak-Truran
James MacLean

General Discussion

Thursday, July 6, afternoon
Room: HS 122
Session 2
A Prolegomena to a Process Theory of Natural Law

Abstract: As in other areas of the academy, the influence of process philosophy on modern and post-modern legal theory has been impeded by the predominance of post-metaphysical assumptions. Modern legal theory has insisted that law must have a rational justification which is independent of religious and metaphysical worldviews. Although postmodern legal theory shares these post-metaphysical assumptions, it rejects the idea that law can have an autonomous, rational foundation and primarily deconstructs the law to reveal its political underpinnings.

The two most important quandaries in contemporary legal theory, however, suggest that legal theory is now ready for a revival of interest in the metaphysical principles presupposed by the law. First, the debate about legal indeterminacy has made it clear that law cannot function autonomously as a self-contained set of rules that can be mechanically applied to resolve disputes. For example, in hard cases, judges must rely on “extra-legal norms” because the positive law is indeterminate. Judicial reliance on these “extra-legal norms” raises the specter that these judicial decisions are illegitimate. In addition, Steven D. Smith has persuasively argued that the metaphysical or ontological presuppositions of the practice of law are inconsistent with the presuppositions of contemporary legal theory. This results in an “ontological gap” between the practice of law, which presupposes a classical or religious ontology, and legal theory, which presupposes a scientific ontology (i.e., scientific materialism) that rejects religious ontology.

This article attempts to demonstrate how a process theory of law can eliminate the perceived illegitimacy arising from legal indeterminacy and close the ontological gap between legal theory and legal practice. I will further argue that a process theory of law is best understood as a new theory of natural law that constitutes a unique addition to the current schools of legal theory. In this process theory of natural law, the telos of Beauty provides a comprehensive normative justification for the law and the so-called “extra-legal norms” relied on by judges when the positive law is indeterminate. Furthermore, it closes the ontological gap between legal practice and legal theory by providing an ontology that unifies the moral insights of religion with the new insights of modern science. As a result, a process theory of natural law solves the two most important quandaries in contemporary legal theory.
Abstract: This paper examines legal reasoning from a process point of view; that is, it seeks to demonstrate how Whitehead’s thinking can be applied to legal decision making to bring to light its underlying processual nature. I begin by identifying a way of looking at law and legal problems that centers on the relation of particulars and universals, focusing on the problem of finding justifying reasons for legal decisions in hard cases. The difficulties involved in attempting to articulate the legal decision-making experience in this way are well documented in contemporary literature, being variously described as ‘the particularity void’, ‘the aporia’, ‘the phronetic gap’. In light of a discussion of these difficulties I utilize a mainly Whiteheadian approach to question the ontological and epistemological assumptions of the institutional theory of law (MacCormick) and attempt to re-present law and legal reasoning in process terms. I suggest that such a repositioning of law within a processual world-view allows a better understanding of the dynamic between institutions and practices (MacIntyre) and provides a more adequate description of the nature of law and legal reasoning; in particular, how a legal decision is created, maintained and employed within the decision making system.

Responders:

Herman F. Greene
Chuichiro Hirose
Franklin I. Gamwell

General Discussion:

Process Thought, Law,
& Rights Theory