WEDNESDAY, 26TH JULY

Terrence W. Deacon
"Process and hierarchy in biology"

Abstract: To be an organism is to typify process: it is a process organization that preserves this process organization with respect to the extrinsic conditions that it depends on. But because of this preservational character—a primitive form of memory—living processes are also potentially accretive, making evolutionary change inevitable. Darwin's logic of natural selection has long been recognized for the way it accounts for adaptation, assuming only reproduction, variation, and competition for resources. But beginning in Darwin's time there have been constant criticisms that natural selection theory is inadequate to account for life's hierarchic complexity and the global evolutionary trend whereby organisms with increasing hierarchic complexity tend to emerge over time; such as eukaryotic cells, multicellular bodies, eusocial organisms, and organisms with brains and minds. Though not in conflict with natural selection, hierarchic evolutionary transitions raise many of the same questions that prompt theorizing to explain the evolution of "altruistic" and prosocial behaviors. Common to these evolutionary transitions is that they involve constraint on the autonomy of component lower-level entities to enable higher-order collective activities to take precedence. Although there have been numerous selection processes proposed to account for the competitive stabilization of higher-order synergistic/cooperative units—from group selection to kin selection theories—there is no theory other than assuming "hopeful monster" mutation to explain *the process of transition* to higher-order synergistic forms. This is because the logic of all selection theories is inevitably *post facto* and subtractive. I argue that the very concept of organism process must account for this emergent tendency, since it is the very basis for the origin of life itself. So the challenge is to explain why and under what conditions formerly autonomous organismic entities tend to spontaneously sacrifice autonomy to form higher-order synergistic forms of organism. By reviewing some major hierarchic transitions in biological evolution I will identify a process that is orthogonal to selection processes and which explains why hierarchic transitions are an unavoidable consequence of organism dynamics.

Mark Dibben
"The Good and Prudent Handling of Things: The Need for an Ecological Management"

This paper considers the problem of Management and the lack of Resilient Ecological Communities. It also sets out a solution, called Ecological Management, which is a new

underpinning narrative to guide management thought and practice so that it can help us navigate through the impending ecological crisis. It argues that management is a universal feature of all purposeful life, i.e. that it is a Naturally occurring phenomenon and not the preserve of Homo sapiens, but that we have turned this Natural phenomenon to a peculiar purpose. That purpose is the making of an entirely artificial commodity – money. As a result, management as we have gone about it is largely to blame for the ecological crisis. The paper explores how this has come to be in terms of the development of what is now the taken for granted and only legitimate form of inquiry, the science discipline model in research universities. Although this was once not the only model, nonetheless its increasing power in the Modern Age has served to inexorably separate us from Nature with inevitable consequences. The paper concludes that for Management to lead us out of the crisis it has largely helped to create, it must be radically refocused not to deliver economy – the artificial wealth of money, but instead ecology – the Natural wealth of the Earth.

Yuval Dolev
"Whitehead, Bergson and the Global Now"

"But, for myself, I cannot reconcile [Einstein's interpretation of his theory] with the given facts of our experience as to simultaneity, and spatial arrangement" (*Science and the Modern World*, 125). Phenomenology, according to Whitehead, does not corroborate the claims concerning time which Einstein based on his theory, and specifically concerning simultaneity. Relativity theory famously does away with absolute simultaneity, and renders simultaneity a frame-dependent relationship. However, according to many, Einstein included, this result is tantamount to the abolition of tense, and the relegation of the distinction between the past, present and future from the physical to the psychological. Indeed, when Einstein snapped at Bergson, in the course of their public exchange in Paris, 1922, "the time of the philosophers does not exist", the gist of what he meant was precisely this – tense and passage belong to the mental, and are not part of the fundamental structure of the universe. Of course, any notion of a Global now had to be relinquished as well. It's this contention that drove Whitehead to reject the standard interpretation of relativity and formulate an alternative. The "given facts of our experience" mandate that we recognize a universe that, "simultaneously with ourselves", extends beyond what we can sense, and which we can apprehend intellectually, e.g., by being able to meaningfully ask what is happening *now* at some distant location (ibid., 127). This conception of a Global Now is intertwined with Whitehead's notion of the endurance of emergent objects. I will argue that Whitehead's interpretation is phenomenologically much sounder than that of Einstein and his followers. I will also suggest that it fits closely with, and was inspired by, Bergson's later philosophy of time. For both, there is a unique present, which is more than just psychological, and which, moreover, is extended in space. However, in contrast with Whitehead, Bergson was not engaged in an attempt to produce a view that integrates cosmological and psychological time and conjoin them within one theoretical framework. Rather, his approach celebrated a pluralism, in which physical and experienced time live side by side. In my paper I will discuss the

significant ways in which Whitehead's and Bergson's understandings of simultaneity overlap, but also the differences emerging from this contrast.

Michael Rahnfeld
"On the Application of Whitehead's Ontology to Ecological Models"
This paper explores at a basic level the applicability of Whitehead's ontology to selected features in theoretical ecology using cellular automats (CAs). As a well-known ecological model we select the coupled non-linear, differential Lotka-Volterra equations, describing the lawful periodic dynamic of ecological systems in which two species interact, one as predator and the other as prey. These equations provide an extremely simplified representation of the system as they do not take into account the spatial distribution of the respective predators and preys in the territory, nor do they reflect the random behavior of living beings. For this reason, a sensible expansion of the model is required which includes such local relationships and integrates a kind of stochastic diffusion process into the model. CAs have proven to be an elegant solution for this problem and apart from this example, due to their ease of implementation and capacity to simulate spatial patterns, CAs have been widely applied to ecological problems related to basic biological processes: dispersal and competition. From a philosophical point of view, it is noteworthy that CAs facilitate bridge building with Whitehead's ontology, completely in contrast to using differential equations. This is due to the fact that, in general, CAs correspond more closely to Whitehead's discrete, probabilistic account beyond classical continuity and determinism reflected appropriately by differential equations. The applicability of Whitehead's ontology to CAs results essentially from their common approach: In Whitehead the self-organizing process of basic organisms (*actual entities*) creates a hierarchy of complex societies including specific laws and in a similar manner CAs generate large-scale patterns from small-scale local processes. In detail it can be shown that key concepts as *actual entity, feeling, prehension, superject, subjective aim, concrescence, nexus, society, epochal time, eternal object, final and efficient causes, creativity* or *value* can be made explicit within the framework of a CA.

Nick Rossiter
"The Monad in Process-Relational Systems"
Whitehead's Process and Reality introduces many of the concepts of metaphysics. Later workers, including Robert Mesle, Margaret Stout and Mary Follett, have used the ideas of Whitehead to formulate the process-relational philosophy. Such a philosophy has been applied in a social context to handle creativity, Becoming, imagination and experience. In a language context, the same philosophy has been applied to ontology or Being.
The process-relational philosophy considers that the world can be thought of a collection of interrelated processes, rejecting the Cartesian dualism of Descartes and favouring the dynamic process (flux) of Heraclitus. Such a philosophy satisfies current requirements in computer science and information systems but has often been difficult to achieve. This is because the basis of much of computer science is set theory, which provides adequately the static (Being) but is

restricted to process as function. Further, handling the logical types across the static and process components in an integrated manner is very difficult in practice, a problem encountered by Russell and Whitehead in their series on set theory, Principia Mathematica. A single-level approach is inadequate for the complexities of information systems.
Much of Whitehead's Process and Reality can be considered as informal category theory, preceding the later developments in pure mathematics, starting in the 1940s by such workers as Mac Lane and Eilenberg. For instance Whitehead's category of prehension, or grasping, corresponds to the categorial adjunction. Other examples are that Whitehead's category of the ultimate corresponds to the topos and his category of existence to the Cartesian-closed category. In this paper we consider how the process-relational philosophy, naturally arising from Process and Reality, can be considered formally in category theory by the monad, which relates inputs and outputs through adjointness. The monad operates on a category, such as a topos, over three-levels, providing the necessary closure of being defined as unique up to natural isomorphism. The term monad was developed by Leibniz and his use of the term will be compared to its use today in mathematics and computer science.

Sinan von Stietencron
“Career Management in a Post Growth Economy”
This paper examines the anthropological conditions which have to be taken into account when considering one’s occupation on a whiteheadian basis and suggests an unconventional way of career management. At the beginning it critically examines the central term Post-Growth-Economy with the aid of alternative growth indices such as Daly and Cobb's Index of Sustainable Economic Welfare and the German National Wealth Index. Based on this conceptual clarification the paper demonstrates the peculiarities of a type of career planning which takes Whitehead’s anthropological implications into consideration. Its argumentation is mainly sourced from Whitehead’s two types of intellectual enjoyment and his criticism of a plain work-relaxation rhythm, as well as a metaphorical adaption of the Concrescence of an Actual Entity. It aims at a conceptual framework for a way of which is fit to meet the requirements of a sustainability oriented economy and society. It develops a theory of a trifold and integrated career model which produces both culture and expert knowledge and matches the requirements which arise within a Post-Growth-Economy. Concluding, already existing examples from different economical fields are used to illustrate the practical applicability and to give an outlook on further developments.

Lenny Gibson
“Durée and Drops”
In the early decades of the twentieth century a great debate on the nature of time began. It echoed through the century and still plays out. The original protagonists were Henri Bergson and Albert Einstein. Whitehead was allied with Bergson, but as Bergson averred, not his lieutenant. Bergson's stipulation was accurate in the moment, but the independence it suggested for Whitehead presaged his advancing from Bergson's ideas to the speculative philosophy of

Process and Reality. The debate began about whether time was best characterized by Einstein's stipulation of objective science or Bergson's subjective durée. The debate extended to the question of whether the deliverances of science provided metaphysical truth or merely advanced an epistemological bias that led to what Whitehead called "the fallacy of misplaced concreteness." A significant understanding of Bergson's influence on Whitehead can be illuminated by that great debate, but I argue that Whitehead developed his ideas beyond that debate's parameters. Whitehead finally maintained that the paradoxes of relativity arose because Einstein's theory maintained a strict difference between the local and the distant. The difference depends on the fallacious idea that time and space are continuous and infinitely divisible. Whitehead alternatively conceptualized what he called "the extensive continuum," which conceives local and distant to be fundamentally connected. The connection is effected through an activity of subjectivity that Whitehead describes where objectivity is ingredient. Whitehead's concept capitalizes upon Bergson's argument that the philosophical conception from antiquity of subjective and objective misconceives a person as made up of two separate parts, one of which is more real and essential than the other.

This misconception leads to a bifurcation of nature into two main categories: one physical and material, and the other psychological and mental. When Einstein understood this criticism as explained to him by F. S. C. Northrup, a student of Whitehead, he said he got it. But then he paused and said at second thought, "it is a fairy tale. Our world is not as simple as that." The irony of Einstein's response is that Whitehead in fact criticizes materialist science for adopting the bias of a simplistic, Cartesian dichotomy between matter and mind.

Einstein came out on top of the debate with Bergson just after the First World War, when the result was announced for the famous eclipse that showed light rays bent as they passed the sun. Later, however, the development of quantum mechanics posed a problem for Einstein. But Whitehead, who already accepted Einstein's relativity theory, was also able to incorporate quantum ideas in his epochal theory of time, and he credited Bergson's thoughts about time as his influence. Bergson's influence on Whitehead was enhanced via William James by leading James, as he says in *A Pluralistic Universe*, "to renounce the intellectualist method and the current notion that logic is an adequate measure of what can or cannot be." It had induced him, he continued, "to give up logic, squarely and irrevocably" as a method, for he found that "reality, life, experience, concreteness, immediacy, use what word you will, exceeds our logic, overflows, and surrounds it." (PR 106) The intellectualist method gives rise to the fallacy of misplaced concreteness. James's focus on immediacy, which led to his stipulating that our experience "grows literally by buds or drops of perception," is central for Whitehead's characterization of actual entities and his conception of the extensive continuum that denies infinite division and the strict division Einstein maintained between the local and the distant.

Leo Caves

“Towards a Process Biology: Whitehead’s Philosophy and Relational Biology”

Whitehead’s Philosophy of *Or ganism*, with its focus on the primacy of *p rocess*, offers a compelling body of thought for those interested in developing new approaches to Biology (Jaeger and Monk 2015) . But rather than new knowledge, or approaches that can be adapted to

concrete problems, Whitehead offers a system of interrelated concepts that constitute a *mode o f thought* (Stengers 2011) that may invite new modes of action (e.g. research). Further, these conceptions are very general, purposely vague and interdependent; rather than being amenable to a reductive analysis, they serve to support an elliptical self-correcting dynamic interplay from which understanding may emerge (Kraus 1998) . In this way, Whitehead attempts to convey the complexity of nature, by building a conceptual scheme that draws deeply on Biological thinking, and a mode of narrative, that is commensurately complex. Given this, a question we can ask is: of what relevance is Whitehead's philosophy for the practice of Biolog y *as a science* (cf. biophilosophy)?

In invoking Relational Biology, Rashevsky (Rashevsky 1954) was inspired to "throw away the matter and keep the underlying organization" by Woodger's (1937) work on the formal axioms of Biology, itself inspired by the symbolic logical framework of Whitehead and Russell's *Princip ia Mathematica*, their project to build mathematics from logical foundations. Rashevsky's student Rosen (1991) (and in turn his student Louie (2009)) developed the algebraic topology of Relational Biology in terms of Category Theory, with an emphasis on structured mappings between sets (i.e. *functors*) (Abramsky and Tzevelekos 2010) . Rosen interpreted these mappings as entailments and his analyses led to him a distinction of living vs. non-living systems via characteristics of a system's entailment structure, specifically that certain kinds of mappings need to be organised in a *closed* loop for self-maintenance and reproduction. This self-referential constraint, causing ambiguity in the system's formal description (an impredicativity), led Rosen to the conclusion that living systems are non-simulable (by conventional Turing machine-based computation).

Bradley (2002), offers an alternative view of Whitehead's philosophical work as an extension of his and Russell's earlier work on the logical foundations of mathematics; Indeed Whitehead described his thinking as "generalised mathematics" and used logic to shape it. Bradley argues that Whitehead's philosophy was built on a "speculative generalisation of the function" and establishes its primacy in the process of *mapping*. This mapping takes form in the cumulative succession of *occasions*, in which occasions contain their predecessors in an iterative manner: this notion is equivalent to that of the functor in Category Theory. Also, characteristic of Whitehead's speculative approach are apparent ambiguities (Nobo 1974) , that I suggest are hallmarks of Whitehead's struggle to convey self-referential or processes in subject-predicate language.

It is interesting, that at the root of Relational Biology there is a (forgotten?) connection to the work of Whitehead (and Russell), and that in some respects its adoption of the generalised framework of Category Theory, is parallel (in conception, not temporally) to the speculative generalisation of functional mappings in Whitehead's later work. In this paper, I will survey the landscape of contemporary Systems Biology, and then explore the connections between Relational Biology and Whitehead's metaphysics, to reflect on the prospe cts for the emergence of a *Process* Biology.

Piotr Leniask

"Withness of the body in Bergson's and Whitehead's theories of perception"

Both Whitehead's and Bergson's views on the role of the body in perception are rooted in their antimechanistic metaphysics. They both put emphasis on unreality of time as a series of unextendended instants and unreality of innert material bodies situated in abstract space.

I am not going just to compare Whitehead's and Bergson's conceptions, but to situate them against their common ground, which as I claim, is Plotinus metaphysical scheme. There are different types of perceptual attitudes or perspectives which we may adopt while perceiving. The first attitude may be called objective or scientific. When we perceive in this way our attention is at the physical aspects of an object. We perceive in a purely objective manner, as if there were no „subjective additions" to the process of perception. We are engaged in „measuring" an object. In the second, subjective attitude our attention goes into the stream of our impressions and associations. We are engaged in „exploring the presentations of the subject". This is typical for empiricist (like Hume or Berkeley) attitude. The third kind of perceptual attitude may be called contemplative. In this attitude our attention is not engaged in any particular task and we are able to notice that there is both objective and subjective pole in the process of perception. Interestingly enough, it is this third attitude where the „withness of the body" may be experienced. Both in subjective and objective attitudes our perception works as if it were disembodied.

In all of the three attitudes there are different kinds of temporalities implied by them. In an objective attitude it is physical time of physical nature, in subjective attitude it is psychological time of an individual and in a contemplative one it is the time of *nunc stans* or „everlasting now". Three kinds of perceptual attitudes and the three types of temporalities may be associated also which three kinds of souls (or its faculties) in Plotinus. There is the higher, thinking soul, active in the intelligible world, the second sort of the soul (the lower soul) which is the faculty of presentation and which is responsible for our „normal" cognitive life. There is also vegetative or „natural" soul responsible for the activity of our body. The proper souls (both higher and lower) are not „naturally" connected to the body, they may descend to it (for human soul to descend is to turn its attention to the body) Plotinus rejects also the popular view that the soul is in the body (it is rather the other way round, the body is in the soul). How do Whitehead's and Bergson's conceptions look like against this view? What does it mean to experience embodiment? What is the role of this kind of experience in our normal perceptual activities? What are the practical consequences of this?

Zbigniew Oziewicz

"Neither space nor time in Nature'

MetaMathematics, over usually employed MetaPhysics, stress imagination without experience, imagination against experience. The fundamental subject of MetaMathematics since ever is the concept of the Universe in the Process. What is the mathematical counterpart of Whitehead's philosophical concept of the Process?

The Leibniz derivation of algebra is synonym of the (in_nitesimal) process, it is a synonym of the ordinary di_erential equation. Some identify Process with Heraclitus (panta rhei), and consider that Process must be opposed to Parmenides (everything is conserved). But fundamental theorem of ordinary di_erential equations claim that each algebra derivation possesses some

conserved quantities, and a lot other quantities that forcibly must be changed. Like iso-thermic process conserving Temperature, but changing Pressure. Adiabatic process conserve heat, but change a lot of other thermodynamical variables. Therefore the both philosophies, of Parmenides and
of Heraclitus, in fact must hold together.
The MetaMathematics of Universe start with The Mathematical Concepts of the Material World published by Whitehead in May 1906, a year after Einstein's publication. However the right mathematical concept of the material body was invented by Minkowski in 1908 as a time-like derivation of algebra of scalars, each such derivation is iso-position Process. This allows to introduce, again by Minkowski, the relative velocity among Processes, the relative velocity that cannot be reciprocal and pick up to the groupoid category of iso-position processes, that cannot be understand in terms of the (Lorentz) group category. The groupoid category was introduced by H. Brandt in 1928 one year before the _rst printing of Whitehead's Process and Reality. In this talk I will reinterpret the Process and Reality within the Brandt Groupoid Category.

Arran Gare

“Re-Embedding the Market”

Karl Polanyi in The Great Transformation diagnosed what had happened in the Nineteenth Century that led to increasingly wild economic fluctuations, increasingly severe depressions, and social dislocation and oppression on a massive scale – the market had been disembedded from communities which were then subjected to the imperatives of a supposedly autonomous market. In fact such disembedding and imposition of these imperatives was a deliberate strategy developed in opposition to democracy as a means to exploiting and oppressing people. Recognizing this, after such disembedding had engendered a major global depression in the 1890s and an even more severe depression in the 1930s, and two world wars, reformers succeeded in re-embedding markets after the Great Depression and the Second World War. This achievement was fought by neoliberals, and their triumph in the 1970s was a really a project of reversion to the Nineteenth Century economic order, now upheld by much more powerful forces, including immensely powerful transnational corporations and much more effective mind control industries. As in the Nineteenth Century, it has concentrated wealth and income, destabilized economies, and threatens a new Great Depression and possibly a new world war as a by-product of global ecological destruction. As opposed to Marxist analyses, Polanyi’s analysis provided a much clearer goal to aim at that has not been discredited by the failures of supposedly communist countries. However, there are still huge problems to be overcome if we are to re-embed the market in communities, including the problem of grappling with the immense power of transnational corporations and those who serve them and the success they have had in corrupting the institutions of democracy and the public sphere through the mind control industries where they have promoted decadence in the population to render them powerless. In this paper I will examine proposals to develop institutions able to achieve this re-embedding, centrally, those promoted by Arild Vatn in his book Institutions and the Environment, and offer further directions for achieving this re-embedding.

Alex Gomez-Marin
"Possibility and obligation in biology"
Biology, inspired by the accomplishments of classical physics in the study of matter, inherited its conceptual frameworks and sought to explain life by means of the double operation of the rational mind that first defines what "could be" and then shrinks it by means of what "should be", rather than grasping directly what "is". This explanatory movement of the scientist's intellect is centripetal —what Jankélévitch called the "Demiurgic prejudice"— in that it tends towards life rather than stemming from it. In order to anticipate the fact, we place ourselves after the fact, incurring at the same time in retrospective and prospective illusions. In a word, we introduce the conditions whose presence we try to explain, at the same time that we miss the essential elements of the phenomenon of life. Intuition, instead, is never ahead nor behind, but contemporary with life. Put plainly, our habitual use of mind places life into the Procrustean bed of matter. Perhaps, composing the real as an artificial hybrid of the possible tamed by the obligatory had to be the first natural ansatz to be tried out. Given the empirical and experiential evidence we now have of the failure of such presuppositions, it is about time we are willing to approach biology as what it was always supposed to be: the logic of the living. I argue that philosophy, either as a spectator or as a commentator of science, cannot effect that transformation alone. Scientists must complete the job from the inside. This requires duration, sustained effort and precision, all hallmarks of intuition — the challenge thus becoming something else than an academic puzzle to solve. As a theoretical physicist turned a behavioral neurobiologist, I will discuss how I see the legacy, the challenge and the promise of Whitehead's, Bergson's and Sri Aurobindo's intuitions in surpassing the comfortable habits of the rational mind, which we believe define us. In a word, I will use the problem of biology to reflect upon our humanness, in an evolutionary context.

Michel Weber
"Bergson and Whitehead: Some Cross-Elucidations"
The proximity that exists between the respective worldviews of Whitehead and Bergson is often underlined. As a matter of fact, it is difficult to deny that both thinkers share the same cultural background, the same concern for the philosophical relevance of XXth century (relativistic) science and for its mathematical core, and a similar interest for common-sense, the limitations of language, uncommon perceptions, religiosity, Post-Darwinian *lebensphilosophie*, and pragmatism. Polymaths they most definitively were.
The outcome of their speculations is also strikingly similar : isn't the "creative advance" directly interpretable with the "élan vital" and vice-versa ? Moreover, their respective understanding of consciousness ("durée" vs. "sense-awareness" and "pure perception" vs. "subjective form of an intellectual feeling") are clearly entangled with the psychophysical concepts of threshold (Herbart, 1824) and the reflex arc theory (Hall, 1832).
In truth, every phenomenology presupposes an ontology, but sometimes one does not make the right ontological requirements explicit. As a matter of fact, one single puzzle remains: the

difference of Whitehead and Bergson respective assessment of James's late ontological interpretation of Zeno. Both valued greatly James's savage creative storms (to borrow Rilke's expression), but while the former adopted the bud theory of experience, the latter remained uncompromisingly faithful to the continuity of the "durée." Since only the bud theory can arguably allow us to understand the ontological requirements of creativity and freedom (continuity involves transformation, meta-morphosis, of existing materials, not creation), this is by no means a subsidiary question. It thus seems likely that contrasting Bergson and Whitehead leads us at a bifurcation: either we accept the epochal theory and Bergson's liberty *qua* creation is a fairy tale, or we stick to duration and some of the late Whitehead's core categories are idiosyncrasies factually useless outside of their genetic space.

Michael Rahnfeld

"From Nexus To Points"

According to Whitehead's Ontological Principle all reality is based on the self-organization of concrete individuals, called actual entities. Finally, every explanation of reality has to refer to actual entities. For our topic it is important that also the construction of points and other geometric objects must be well-grounded in actual entities and there relationships, called nexus.
The self-organization of actual entites can be analysed from two points of view: (1) The genetic analysis stresses the internal view of stepwise growing together of actual entities to nexus in terms of prehensions and finality (self-direction). (2) The morphological analysis, called coordinate division, emphazises the outside or public viewpoint of the completed process of self-organization in terms of contiguous regions within a four-dimensional spacetime. These regions are continous artifacts as the granulated structure of their development disappears.
The morphological analysis makes use of geometrical objects as point, line, plane or space. According to the Ontological Principle these terms have to be constructed out of nexus of actual entities, and this means that geometry must be derived from ontology in a purely formal way. The formal method of construction has to meet two criteria: (1) the logic of relations in terms of Whitehead and Russell and (2) the minimalist principle well-known as Ockam's razor.
In accordance with (2) Whitehead selects a single domain of objects only, namely that of nexus whereby it applies that all nexus are continously connected, and in the same sense Whitehead selects one logical relation only, namely C of extensive connection (overlapping, inclusion or contact) which proves to be sufficient to define all relevant geometric terms.
Whitehead's account to see points not as single substances but as constructions has been further advanced in modern mathematics, especially
(1) in the space theory by Kleinert which is motivated by the fact that space as point set is a mathematical fiction without phenomenological justification, and (2) in the so-called Scheme Theory developed by Grothendieck. In both cases points are thought as morphisms in the sense of Category Theory, and this is the key difference to the traditional view which understands points a substances: In the process thought of Category Theory substances are made dynamic insofar points are transfered into morphisms.

Matt Segall

”The Place of Life in the Cosmos: Feeling the Origin of Organism”

Resolving longstanding aporias with regard to the ontology of life, not to mention the ontology of mind, will require re-imagining the mechanical world-picture that still holds sway over the biological sciences. Following the groundbreaking approach of Evan Thompson (*Mind in Life*, 2007), which builds on Varela and Maturana's earlier work on the concept of autopoiesis, I will defend the strong continuity thesis regarding life and mind: To be a autopoietic being is already to be a cognitive being; in other words, *life is mind*. But the approach of Thompson, et al., does not go far enough, since while it may help close the gap between life and mind through a kind of biological transcendentalism, it leaves the gap between life and matter as wide as ever. What is the place of living organisms in the physical cosmos? Are organisms peripheral anomalies, or essential participants in our universe? For help resolving these questions, I turn to the *Naturphilosophie* of Friedrich Schelling and the philosophy of organism of Alfred North Whitehead. Both of these philosophers, or "biophilosophers" to use Koutroufinis' word ("Introduction," *Life and Process*, 2014), argued that making sense of biological organisms requires an intuition of the cosmic organism of which the former are microcosmic recapitulations. Articulating an organic cosmology, implying a kind of evolutionary panpsychism, is the only coherent way to account for origin of biological organisms. Without taking this radical step beyond the mechanical world-picture inherited from Descartes, and a further step beyond the transcendental compromise defended by Thompson, life and mind remain inexplicable phenomena in an otherwise dead and dumb universe.

Tamar Levanon

“Bergson and Whitehead on the Tension between Language and Experienced Temporality”

Bergson’s attack on the intellectualist mindset is a pivotal theme in his writings. Especially prominent is the tension between Bergson’s perspective on language and his account of our experience of temporality. Language distorts the real nature of experienced temporality since—by creating concepts such as ‘earlier’, ‘later’, ‘before’ and ‘after’—it discriminates between phases that are actually fused together. According to Bergson, the elements within our stream of experience “intermingle in such a way that we cannot tell whether they are one or several” (1913, 137). In fact, since from the Bergsonian perspective there is a complete fusion of the elements within our stream of experience, it is almost impossible to even use the term “element”. He referred to this complexity as follows: “I said that several conscious states are organized into a whole […] but the very use of the word ‘several’ shows that I had already isolated these states, externalized them in relation to one another, and, in a word, set them side by side” (1913, 122).

Thus, Bergson endorses a radical position with regard to the unity of temporal experiences: it is a unity that is explained in terms of an extreme blurring between phases and renders the idea of stages superfluous. “Intermingling” is probably the most convenient way to express what is actually inexpressible, viz., the comprehensive unity of temporal experience.

Mullarkey captures the essence of the problem as follows: "...according to everything Bergson seems to write about language, thought and philosophy itself, it is far from evident how he, or anyone for that matter, could have ever been able to write genuinely about time at all" (1999, 150).
Like Bergson, Whitehead is uncomfortable with the authority of language in accounting for our experiences. In fact, he holds that one of the two problems of philosophy is the "uncritical trust in the adequacy of language" (AI, 228) and that the history of ideas should be studied with a "constant remembrance of the struggle of novel thought with the obtuseness of language" (AI, 120). We create words in order to cope with practical needs and develop effective actions. Therefore, language is directed toward prominent aspects of changing situations. It is concerned mainly with the facts, which are "seized upon by consciousness for detailed examination, with the view of emotional response leading to immediate purposeful action. These prominent facts are the variable facts,—the appearance of a tiger, of a clap of a thunder, or of a spasm of pain" (AI,163). But they are also superficial facts and while they are often conceptualized, other more complex and enduring structures of consciousness do not have verbal representation. The dynamic nature of temporal experience is one example of such an element, which expresses the nature of consciousness itself rather than the facts (AI, 163).
In my paper, I will address aspects that are common to both Bergson's and Whitehead's perspective on the inability of language to fully express the experience of temporality. However, while Bergson focuses his attack on the inherent inefficiency of symbols, Whitehead stresses the need for new symbols to deal with new experiences and the need for revisions of existing symbols.

Helmut Maaßen
"Spinoza on necessity and probability"
At first glance, Spinoza's a concept of absolute necessity leaves no space for any form of probability, possibility, contingency etc. This view is shared by many interpreters, turning Spinoza's thought into an obsolete, contradictory and inconsistent sytem. However, the stating of contradictions in any concept of necessity enables us to interpret Spinoza differently. This would include a certain concept of probability in his thought, thus allowing an acceptable basis for his ethics.

Franz Riffert
"Is Whitehead's Call for Autonomously Developing Schools Realistic?"
Alfred North Whitehead emphatically declared „that school is the educational unit […], no larger unit, no smaller unit" (Whitehead 1929/1967, 14) and that any educational reform has to take this into account if it seriously tries to avoid complete failure: „[T]he first requisite of educational reform is the school as a unit, with ist approved curriculum based on its own needs, and evolved by its own staff. If we fail to secure that, we simply fall from one formalism into the another, from one dung-hill of inert ideas into another." (Whitehead 1929/1967, 13 italics added). Based on this position the author and his team have developed in a ten years process the Module

Approach to Self-Evaluation of School Development Processes (MSS) and successfully implemented it in about a dozen of single schools in Austria. (Riffert & Paschon 2005; Riffert 2005).
Despite these prototypically successful efforts and its inspiration by process philosophy the question remains if this approach can be justified empirically. Elinor Ostrom's Core Design Principles (CDP) offer the possibility for such an attempt: Ostrom (+2013), the first woman to win the Novel Prize in Economic Sciences (2009), devoted her whole career to challenge Garrett Hardin's claim of a Tragedy of the Commons (1968) which states that a sustainable management of common goods can only be secured by centralist state top-down regimes or by radical privatization approaches. Based on a huge data pool about local groups trying to manage common pool resources on their own, she and her colleagues at the University of Indiana have shown that sustainable self-governance of the commons by local groups is possible. By comparing those groups which failed to those which were successful she came up with what she called the Core Design Principles (Ostrom 1990, 2010). They characterize the successful groups and have been empirically supported recently, for instance, by a review of 91 studies. (Cox, Arnold & Villamayor Tomás, 2010). In this presentation it will be shown that the MSS is able to contribute to the realization of Ostrom's Core Design Principles. While this offers empirical justification for the MSS, which was developed to support Whitehead's call for autonomously developing schools, it also adds to the ongoing process of generalizing Ostrom's Core Design Principles to new fields of application. (Davies & Ostrom 1991; Wilson, Ostrom & Cox 2013)

Jason James Kelly

"The Allure of Cosmic Consciousness: How the philosophy of organism can enhance our contemporary understanding of spiritual ecology"

In light of the alarming evidence on climate change provided by the scientific community is difficult to question the fact that we are living in the midst of an ecological crisis that threatens the very existence of all life on our planet. Yet, despite this knowledge powerful nations throughout the world continue to support neoliberal social and economic policies that fail to address the urgency of the situation. The question is: what steps can we take as a global community to stave off disaster? In her recent work, *This Changes Everything* (2014) the Canadian philosopher and social critic, Naomi Klein, argues that the hopes of turning to science and technology for answers to the ecological crisis is short-sighted because such a move fails to address the heart of the issue, which is that we are encultured by religious and secular ideologies that have normalized the central conceit of modernity – namely, our mastery over nature. Klein and other progressive environmentalist are convinced that what is required is a fundamental change in how human beings relate to the environment. In other words, we need new ways of *being-in-the-world*. To this end, the emerging field of spiritual ecology has sought to call attention to alternative narratives of *being-in-the-world* that highlight nature's intrinsic value. I believe that a deeper understanding of the relationship between spiritual ecology and process philosophy can play a pivotal role in helping us to create more ecocentric narratives to counter the hegemonic dominance of neoliberal philosophy. In this paper I examine how certain concepts associated with spiritual ecology, such as holism, relationality, cosmic consciousness

and biophilia can be reconfigured in light of Alfred North Whitehead's philosophy of organism. Ultimately, I suggest that both spiritual ecology and the philosophy of organism privilege a nondualistic conception of consciousness that can be utilized to support the emancipatory efforts of the contemporary environmental movement.

Sinan von Stietencron

"Speaking Truthfully in Art and Science: Whitehead and Bergson as pioneers of a new scientific use of language"

This paper deals with the critical position of language in a process-based metaphysical system which tries to preserve its claim to truth. It investigates the stance Bergson and Whitehead took on the subject of language, interconnects their positions and subsequently proposes a simple training model for a truthful use of language. In a first step it briefly sums up why and to which extend Bergson and Whitehead doubted the ability of language to grasp general truths and how they dealt with this general dilemma in order not commit a performative contradiction within their philosophical schemes. Assuming the non-ontological nature of generic terms it then proposes a model which demonstrates a rhythmic interplay between two incommensurable modes of linguistic usage. The two modes are developed from Bergson‘s notion of ‚Intuition‘ and Whitehead‘s two fallacies, the ‚Fallacy of Misplaced Concreteness‘ and the ‚Fallacy of the Perfect Dictionary‘. It is shown that both modes express two complementary key intentions of the (process-)philosophical endeavor which depend on each other in order not to degenerate. Using examples from areas such as Fine Art, Natural Science and Philosophy it illustrates the practical application of said modes and demonstrates their mutual relatedness in practice, aiming at an increase of integrated contrast within said scheme. In a final step it briefly sketches a future scientific community which practices the proposed use of language in order to see if such a use would settle Bergson's and Whitehead's claims.

Hilan Bensusan

"Leibniz and Whitehead: the time of process"

It is often held that the philosophy of organism of Whitehead has strong similarities with Leibniz's mature system and can therefore be understood as a neo-monadology. The commonalities involve a metaphysics of agents, a pluralism that posit no isolated atom, a rejection of substrata and a social articulation of the ultimate units of reality. The approximation between the two systems has been made explicit, in recent years, from very different perspectives by authors such as Gilles Deleuze's (1988), Timothy Mooney (1988) and Pierfrancesco Basile (2009, 2015). In fact, there seems to be a major strand in process philosophy – associated also to names like James Ward, Gabriel Tarde and Bruno Latour – that, postulating individuated units of action as the ultimate reality, draws on the idea of a monadology. In recent works (Bensusan 2016, Bensusan & Alves de Freitas 2017) I have attempted to find defining features of a general monadological framework and have claimed that such framework constitutes a general scheme of metaphysics of which Leibniz's monads were

the first example. Whitehead's philosophy displays these features and postulates a metaphysics where individual while interdependent units of action are the ultimate reality. The monadological character of the philosophy of organism illuminates several elements in Whitehead's thought and provides a baseline to understand the fabric of concreteness out of ultimate actual entities. More insight can nevertheless be gained by asking where exactly the difference lies between a design philosophy like Leibniz's monadology and a thoroughly processual thought such as Whitehead's neo-monadology. The splitting point between the two systems is the main concern of this work.

My thesis is that the main difference between Leibniz's concerted monads and Whitehead's philosophy of process springs from considerations concerning time. A process philosophy requires that the present time brings in what constitutes concrete reality – the passing of time is more than an execution of a determined design and an instantiation of an already selected configuration. The present time brings about genuine novelty. In contrast, Leibniz understands the co-existence between his monads as shaped by what can be described as a succession of three distinct times – the present time where the monads co-exist being entirely subsidiary of the others. These three very different times are implicit in his idea of a creation by design and in the role of God as the one who chooses freely and wisely what appears to an unsurmountable intellect who doesn't act by necessity as the best of all possible worlds. In the first of these three times, the different infinite possible worlds are presented to God. It is the time of the architecture of the Palas palace, following the image of Valla's extended dialogue at the end of the *Theodicy*. There, each room is a possible world. This is the time of contemplation where the different possible worlds appear in front of God. To be sure, the first time took no time at all, as God requires no time to accomplish mathematical operations and Leibniz understood that calculating what is compossible is one of such operations. As such, the architecture of the Palas palace was a mathematical operation and one that appeals to no more than analytical truths. In this first time, the Eden's apple somehow interacts both with Adam and with Adam* which is not Adam because Adam is the one who sins (using the example in Leibniz's correspondence with Arnauld) and Adam* is his counterpart who doesn't eat the apple. As a result of the first time interactions, Adam and the Eden's apple are compossible but Adam* and the Eden's apple are not. Therefore there is a possible world where Adam sins by eating the Eden's apple and another where Adam* interacts maybe with an apple*. This strange first time that takes no time is distinct from a second time: the time of choice. Then, God dealt not in necessities, but freely and wisely chose between the different possible worlds that had been contemplated. Importantly, the choice was global and every element in the each world (including the prayers) somehow contributed to the overall choice of a possible world. Here God exercised freedom and made a contingent determination of one course of action among infinite others; further, the determination was one that was made once and for all. The conjunction of these two first times makes up for pre-established harmony. It is only after these two times that present time takes place.
In Leibniz, the first two times shape the third, present time. The interaction between the units of ultimate reality have taken place beforehand and the present time is when these interaction are made actual. In contrast, in process philosophy the present time is loaded with the events of Leibniz's first two times: compossibles are calculated on the fly while perception and action are taking place and choices are determined by the aims and purposes of each actuality. Whitehead's

present time is not the execution of a previously stipulated arrangement but rather a moment of sprouting novelty and diversification, specification and exception don't follow from a determination taken once and for all. In *Modes of Thought* V, Whitehead contrasts his philosophy with the postulation of a barren tautological absolute; we can say that the present time is conceived as not barren, never tautological and in no manner absolute. This dense present time – that can be better understood if we consider that it shelters the events that Leibniz placed elsewhere – is the time of process. It is precisely what makes a monadological system into a process philosophy – time is a genuine mode of alteration, it brings in movement. The present time is not the form of process, it is the agent of process itself as the present is shaped by the concrescences actually co-existing. What crucially distinguishes a monadology of design – such as Leibniz's – and a process monadology, I claim, is precisely the dense present time where multiple contemplations and choices are simultaneously happening and the commencing of any action takes place.

Shengquan Luo

"The Contemporary Significance of Whitehead's Educational Thoughts"

Whitehead's educational thoughts are based on an organic philosophy and its content including process education, ecological education and life education. These thoughts have important guiding significance for contemporary education. First of all, contemporary education should regard the procedure of education as value guidance, cultivating "wise men" as its value orientation. It might show students the value of self-generated and rhythmic characteristic of intellectual development, and show how to correctly handle the relationship between freedom and discipline, knowledge and wisdom. Taken together, professional knowledge and general culture knowledge can promote individual growth. Secondly, contemporary education should regard the ecological education as a logical mainline, advocating the ecological conception of 'harmony between man and nature' ontologically, the natural central thought of 'harmony of heaven and human' as a value theory, and the ecological education of 'heaven and human symbiosis' as a methodology. In addition, contemporary education should regard the life characteristic of education as an eternal theme, understanding education originated in real life, as opposed to education as separate from life, returning to education to life and life to education.

Tomasz Femiak

"The art of conscious speaking and the essence of education"

The essence of education is that it be religious [...] A religious education is an education which inculcates duty and reverence.[...] And the foundation of reverence is this perception, that the present holds within itself the complete sum of existence, backwards and forwards, that whole amplitude of time, which is eternity (A. N. Whitehead, The Aims of Education and Other Essays, New York 1967/29, p. 26).

What does A.N.W. mean by "this perception"? Is this esthetic or contemplative kind of experience? How do we activate our attention in that kind of experiences? In our exercise of

conscious speaking we try to revive the individual's natural perception of the present, directing his attention to the primary process. The exercise arose as a result of interpreting of the Maiuetics of Socrates in the spirit of Homeric psychology. The exercise was incorporated in academic teaching. Students were asked to note their observations during the exercise, some sessions were filmed. A very interesting material was gathered which is the base of further theoretical and empirical research.

The cognitive part of the process of speaking is much wider than we tend to think. Is it possible that some habitual forms of speech, undesired emotions and some forms of mental interpretations are processes leading us away from the primary (or natural) process of speaking?

The exercise of conscious speech refers to Whitehead's protest against intellectualism in education, but also to his understanding of *an immediate perception of a concrete fact of actualisation of a subject* (A. N. Whitehead, Science and the Modern World, New York 1991/23, p. 272). It seems that in the conscious speaking we experience the natural spontaneity of thinking as a **creative process**.

Conscious speaking may be described as regaining the state of "being present" by means of reconnecting to the primary process. From the philosophical point of view real presence is an interesting angle of consideration, from the didactic point of view, it is the most serious problem for all teachers: the activation of the process of experience and real creative understanding in students.

The process of conscious speaking is easily interrupted. For example the moment we begin to observe it, or control it or begin to lock it into words and concepts, it loses its spontaneity and disappears. In conscious speech it is possible that the moment of pure oneness with the process exists, but it is interrupted every moment we wish to "catch it" The latter interpretations of bodily sensations and state of mind show a big difference between the 'normal' state of speaking and a state we call "conscious speaking". Being in the primary process may be understood as regaining a state of childlike spontaneity of speech without disturbance of thinking or emotional routines. It is kind of a unity of existence, where feelings, thoughts and communication are in natural union with themselves.

During my presentation I will shortly describe the homeric sources of the exercise and try to explain some details of the method. Some visual material will be also presented. I will sum up the experiment to this point, in order to receive a creative criticism, which will hopefully aid further research.

Katelynn Carver

"Whitehead and Phenomenology"

The literary works of Virginia Woolf consistently evoke what she calls a "philosophy" of interconnectivity within the world. From this thematic scaffolding of intersubjectivity, this paper connects Woolf's writings with the process-relational metaphysics developed by Alfred North Whitehead, focusing specifically on the interconnectivity of beings within the creation of momentary reality as well as across time. In thus highlighting the similarities between Woolf's work and Whitehead's metaphysical model, the potential application of this unique intersection

of writing and process-relational philosophy to the recognition and development of literary coping mechanisms for mental illnesses will also be explored.

Carlos Joao Correia
“Substância e Processo: Leibniz e Whitehead”
A presente comunicação tem como objectivo mostrar a importância da metafísica leibniziana para a filosofia do processo em Whitehead. Para esses efeito, mostraremos como é possível construir uma teoria das mónadas que transcenda as categorias tradicionais do pensamento substancialista.

Carla Milani Damião
"The experience of duration: between nature and the social"
We have in view the temporal notion of duration (*durée*) in Henri Bergson and some theoretical intersections connected therewith. These connections will be established in a necessary way with the epochal theory of time in Whitehead, that is to say, of the understanding of the time constituted atomically by epochs, which foresees a kind of temporal divisibility related to the idea of duration. The relationship between Whitehead and Bergson on this issue is well known. Our proposal is to explore other relationships based on the experience of duration defined in *Matière et Mémoire* by Bergson, according to the well-known hypothesis launched by Walter Benjamin in his essays on Baudelaire: that the writer is able to participate in the experience of duration and that Marcel Proust would have been the writer to test such theory of experience. Walter Benjamin's phrase that motivates us to reflect on the proposed theme is: "Proust's work, *Le Recherche du Temps Perdu*, may be considered, under current social conditions, as the attempt artificially to reproduce the experience as Bergson imagined it, as one can have less and less hope of realizing it by natural means”.

Yulan Liu
“The Contemporary Value of Marx 's Nature View”
Historical materialism and surplus value theory are the two major discoveries of Marx, which has long been accepted. The misunderstanding that Marx’s nature view is only relevant with people and productive forces, results to the aphasia state of Marx's thought in solving the current ecological crisis. Making further study on Marx’s nature view in order to deal with the current global crisis of modernity, it is an important topic. Marx makes great emphasis on humanized nature. He explores the contemporary history of nature, analyzes the fact that nature is ruled by capital logic, and points out that nature is neither an independent, non-human existence nor an exploited passive being. Opposite to the mechanistic view, Marx points out that nature has one-way agency while human being has two-way agency, so the relation between human being and nature is organic process, not relationship between subject and object. Nature being taken as the external entity, and neglecting nature’s organic link to people and society, is the root of modern ecological crisis. In this point, Marx and Whitehead have something in common.