Michel Weber and Will Desmond (Eds.)
Handbook of Whiteheadian Process Thought
Volume 1

P R O C E S S T H O U G H T

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Volume II—Thematic Entries; Biographical Entries; Critical Apparatus

Abbreviations

AE	*The Aims of Education*, 1929 (Free Press, 1967).
AI	*Adventures of Ideas*, 1933 (Free Press, 1967).
CN	*The Concept of Nature*, 1920 (Cambridge University Press, 1964).
D	Lucien Price, *Dialogues*, 1954 (Mentor Book, 1956).
ESP	*Essays in Science and Philosophy*, 1947.
FR	*The Function of Reason*, 1929 (Beacon Press, 1958).
IM	*An Introduction to Mathematics*, 1911.
IS	*The Interpretation of Science*, 1961.
MCMW	"On Mathematical Concepts of the Material World", 1906.
MT	*Modes of Thought*, 1938 (Free Press, 1968).
OT	*The Organisation of Thought*, 1917.
PM	*Principia Mathematica*, 1910-1913 (Cambridge U. P., 1925-1927).
PNK	*Principles of Natural Knowledge*, 1919/1925 (Dover, 1982).
PR	*Process and Reality*, 1929 (Corrected edition, 1978).
R	*The Principle of Relativity*, 1922.
RM	*Religion in the Making*, 1926.
S	*Symbolism, Its Meaning and Effect*, 1927.
SMW	*Science and the Modern World*, 1925 (Free Press, 1967).
TSM	"Time, Space, and Material", 1919.
UA	*A Treatise on Universal Algebra*, 1898.

Preface

Jan Van der Veken[i]

This book is truly a tribute to the universal applicability of Whiteheadian thought. One of the criteria for accepting a philosopher as a spiritual guide is the fruitfulness of his insights to illuminate every aspect of our experience. Whitehead indeed tells us that a philosophical system should take into account every experience:

> Nothing can be omitted, experience drunk and experience sober, experience waking, experience drowsy and experience wide-awake, experience self-conscious and experience self-forgetful, experience intellectual and experience physical, experience religious and experience sceptical, experience anxious and experience care-free, experience anticipatory and experience retrospective, experience happy and experience grieving, experience dominated by emotion and experience under self-restraint, experience in the light and experience in the dark, experience normal and experience abnormal (*AI* 290-1).

Many people discovered Whitehead because he "made sense" of what they were experiencing and studying, whether it was logic or mathematics, religion or philosophy of nature, politics or ecology. Whitehead's conceptual scheme indeed helps us to interpret the world in which we live:

> Speculative Philosophy is the endeavour to frame a coherent, logical, necessary system of general ideas in terms of which every element of our experience can be interpreted. By this notion of 'interpretation' I mean that everything of which we are conscious, as enjoyed, perceived, willed, or thought, shall have the character of a particular instance of the general scheme (*PR* 3).

The requirements of coherence and of logical structure are especially tackled in this *Handbook* in a section on Mathematics and Logic. These rather difficult questions are often overlooked in introductions to Whitehead's philosophy.

The "empirical side" is expressed by the terms "applicable" and "adequate". "Applicable" means that "the texture of observed experience, as illustrating the philosophic scheme, is such that all related experience must exhibit the same texture". I think that "style" is another rendering of the same requirement. "Style" was an idea put forward by Merleau-Ponty, and as is made evident in two of the contributions, the relationship between Whitehead and the later Merleau-Ponty is worth studying.

There is indeed a certain style to approach the different domains of our experience, and that "style" accounts for the deep unity of the *Handbook* that is offered to us. That "Whiteheadian style" is easily recognizable. Whitehead himself always puts a problem in a broader perspective:

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[i] President of the European Society for Process Thought 1978–1998; Emeritus professor at the Institute of Philosophy, Leuven; jan.vanderveken@hiw.kuleuven.ac.be.

there is not something like an isolated discipline which has absolutely no connections with the overall scheme of things. In this sense there is a deeper unity of this *Handbook*, in spite of its obvious diversity: in any domain of human experience, we are confronted with an aspect which illumines the whole. Deep inside we surmise that everything is related to everything, and that everything somehow exists together, is related to the whole. Philosophy looks for that essence of the universe which ensures that nothing exists in isolation.

Whitehead's conceptual scheme is a tool, not a doctrine. As a mathematician Whitehead does not shy away from the constructive part of the philosophical enterprise. He knows that a philosophical system does not pre-exist. It cannot be found "ready made," waiting for its discovery. It is rather the result of the endeavour to grasp the general in the particular: a philosophical system has to be created, the best one can. Whitehead has the extraordinary gift of being at ease as much in logic and mathematics as in the world of civilisation, religion and art. He may not be a specialist in all these domains, and "real" experts will always be capable of finding objections about the details. The same applies when we situate Whitehead in the history of philosophy. He knew how to draw insights from his preferred authors, like Plato, Locke, Spinoza and also from scientists such as J.C. Maxwell and A. Einstein. But he was hardly interested in the exact phrasing or historically correct interpretations of their insights. He was reading and meditating on those authors, asking himself what he could do with them. The *Biographical entries* in this *Handbook* contain an impressive array of contemporary and historical figures. This section is quite illuminating for getting an inkling of the extraordinary scope of the Whiteheadian conceptuality. Do not expect an answer to the question whether Whitehead "had it right". Rather, learn to capture the Whiteheadian "style."

This *Handbook* is a landmark in Whiteheadian scholarship.

In the sixties and seventies of last century Whitehead has been introduced to a new generation of philosophy students by scholars such as Ivor Leclerc, John B. Cobb Jr. and Schubert Ogden. Not to forget Charles Hartshorne, who himself was the teacher of a whole generation. He was also a philosopher in his own right. He has done more than anyone else to introduce Whitehead's metaphysics. The collection of articles that Hartshorne wrote about *Whitehead's Philosophy* (*Selected Essays, 1935–1970*, published in 1972) are even today an introduction to Whitehead "without pain." Yet, the fact that Hartshorne was teaching mainly philosophical theology accounts for the fact that the process movement caught fire above all at Theology Faculties (Chicago, Claremont). The extraordinary fruitfulness of the Whiteheadian conceptuality in elaborating a relational theology has somehow influenced the "reception" of Whitehead. Although Whitehead as such is not a professional theologian, his insights proved to be extremely helpful. Whitehead has offered a conceptual scheme which is at least congenial with a contemporary Christian incarnational understanding of God. The bibliography published by Barry Woodbridge gives an ideal idea of Whitehedian scholarship until 1977.[1]

The Claremont School of Theology, mainly due to the efforts of John B. Cobb Jr., has been during several decades "the den of the process lion." An impressive number of conferences took place in Claremont and elsewhere. Remember the Silver Anniversary Conference in Claremont in 1998. Contacts with Buddhists and Chinese scholars made possible a conference in Beijing in 2001 entitled *Whitehead, China and the New Millenium*, which attracted 120 scholars. Much of

the work done in process thought found its way to the journal *Process Studies* (with working bees such as Lewis Ford, B. Whitney, and many others). In the meantime the home journal *Process Perspectives* and the journal *Creative Transformation* (by the Process and Faith group) have informed the international community of the extreme usefulness of the Whiteheadian outlook on reality for tackling questions concerning the common Good, the sustainability of the planet, human rights issues, etc.

In 1978, Charles Hartshorne was conferred an honorary degree at the Katholieke Universiteit Leuven where he was also teaching a one-semester course in Philosophical Theology. At that occasion, there came together, for the first time in Europe, a number of process thinkers, including Norman Pittenger, H.G. Hubbeling, David Pailin, Michael Welker, Wim Welten, Jean-Marie Breuvart. A *European Society for Process Thought* was established. When the degree was conferred, a conference was organized around the theme of *Whitehead's Legacy*. Somehow "Whitehead" caught fire in Europe, and important conferences were organized in Köln, Bad Homburg, Sigriswil and other places. The focus was now on relating Whitehead to other philosophers, and important studies have been published in the volumes relating to those conferences.[2] In 1998 the ESPT organized a conference in Lille-Kortrijk about *The Future of Process Thought in Europe.* Given the new possibilities offered by internet, we decided that from now on members of the ESPT should send their papers by e-mail. Helmut Maassen set up a web-site and, together with James Bradley, André Cloots and Michel Weber, launched a series *European Studies in Process Thought* and edited the first Volume *In Memoriam. Dorothy Emmet (1904–2000)*, including Dorothy Emmet's Notes on Whitehead's Harvard Lectures, 1928–29 (see www.espt.de).

At that moment it was completely unforeseeable what the third wave of Whiteheadian scholarship would be like. An *International Process Network* has been created to coordinate the many process initiatives all over the world (see www.processnetwork.org). A new generation of scholars, such as Michel Weber, Palmyre Oomen, Ronny Desmet, Pierfrancesco Basile e.o. came to the fore. Several doctoral dissertations were written in Leuven, Louvain-la-Neuve and the Netherlands, so much so that at one of these defences the Dean of the Faculty said "that Whitehead was becoming fashionable." Isabelle Stengers became deeply interested in Whitehead and gathered around her a whole group of philosophy students. Isabelle Stengers has published an impressive book *Penser avec Whitehead. Une libre et sauvage creation de concepts*.[3] She sees strong connections with Gilles Deleuze, and this theme has been the topic of a number of doctoral seminars with Keith Robinson and of a conference organized by André Cloots and Keith Robinson in Brussels.[4]

Mainly due to the inexhaustible energy and the publishing skills of Michel Weber, two whole series of books are being published by Ontos Verlag, under the title *Chromatiques Whiteheadiennes* and *Process Thought* (see www.chromatika.org and www.ontos-verlag.de). "Chromatiques" expresses well the broad scope of the topics under discussion, both at a weekly seminar at the Sorbonne and at the different Whitehead conferences.

This *Handbook* serves as an apogee of this third wave of Whiteheadian scholarship. Never has the extraordinary scope of the Whiteheadian conceptuality been brought to the fore in a more impressive way. The clear structure of the book makes the wealth of material a little less

bewildering. Everyone can easily find his/her field of expertise, and the bibliographies allow for easy in-depth study of the topics touched upon.

As "emeritus" of the second wave, I can only wholeheartedly welcome this upsurge of creative dynamism. It was of course unexpected, but it is certainly a new step of the flight of the spirit of the Whiteheadian adventure.

Notes

[1] *Alfred North Whitehead. A primary-secondary Bibliography*, Barry A. Woodbridge, Editor. Jay McDaniel and Marjorie Suchocki, Associate Editors, Philosophy Documenation Center Bowling Green State University, Bowling Green, Ohio 43403, U.S.A.

[2] *Whitehead und der Prozessbegriff. Whitehead and the Idea of Process*. Beiträge zur Philosophie Alfred North Whitehead-Symposium 1981. Proceedings of the First International Whitehead-Symposium 1981, Harald Holz and Ernest Wolf-Gazo, eds., Freiburg/München, Karl Alber 1984. *Whiteheads Metaphysik der Kreativität*, Friedrich Rapp and Reiner Wiehl, eds., Freiburg/München, Karl Alber 1986.

[3] Isabelle Stengers, *Penser avec Whitehead. Une libre et sauvage création de concepts*, Paris, Seuil 2002.

[4] *Deleuze, Whitehead and the Transformation of Metaphysics*, May 23-25 2005, André Cloots & Keith A. Robinson (eds.), Brussel, Koninklijke Vlaamse Academie van Belgiê voor wetenschappen en kunsten, 2005.

I. Introduction

Michel Weber[i]

The present *Handbook of Whiteheadian Process Thought* is the product of three years of collective labor. Gathering 113 entries written by 101 internationally renowned experts in their fields, it aims at canvassing the current state of knowledge in Whiteheadian scholarship and at identifying promising directions for future investigations through (internal) cross-elucidation and (external) interdisciplinary development. There is indeed an urgent need to interpret Whitehead *secundum* Whitehead and to read him from the vantage point of interdisciplinary and cross-disciplinary research. As Felix Frankfurter claimed in his tribute to the philosopher some sixty years ago, the "need for breaking down sterilizing departmentalization has been widely felt. Unfortunately, however, a too frequent way of doing it has been, wittily but not too unfairly, described as the cross-sterilization of the social sciences."[1] This misplaced concreteness is precisely what we seek to avoid here.

Needless to say, the Whiteheadian legacy is exceptionally rich, both because of the various expertises and character of A.N. Whitehead (1861–1947) himself, who worked in most *scientific* areas of his time, and also because of the contemporary challenges in philosophy, techno-science and politics. According to Hilary Putnam, scientists acknowledge nowadays the contribution of only three "philosophers": I. Kant (in astronomy with his 1755 *Nebular Hypothesis*), C.S. Peirce (in geodesy, gravimetry and *Photometry* in 1878) and Whitehead (in relativity with his 1922 *Principle*). Of course this list would be very long if one were to take account of all actual philosopher-scientists: we would have to go as far back in the Western tradition as the Presocratics, and give much attention to Descartes, whose influence (especially in the cognitive sciences) has been lasting and remarkable and who could be seen as Whitehead's arch-enemy—even though he fostered the modern "subjectivist bias" and anticipated the merging of space and matter.[2] However, given the state-of-the-art in the sciences and the humanities, Whiteheadian process thought remains the most promising, both from a *synthetic* perspective (because of its capacity to bring together, i.e., coherently articulate, all gnoseological fields both within and without philosophy) and from an *analytic* one (because of its potentiality for contributing to—if not solving—topical conundrums). Last but not least, Whiteheadian processism is intrinsically *critical*, both in the transcendental and pragmatic senses (it is fully aware of the limitations of intuition, sense-perception, language and rationality) and in the fallibilist one (applicability matters as much as coherence while adequacy

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remains out of reach): hence, new light is cast on the crucial arguments of Kant, Peirce and Popper.

This introduction will sketch Whitehead's life and works, present his legacy, and offer some remarks about the *Handbook*'s general policy and on its entries.

1. Brief Vita

Born on 15 February 1861 at Ramsgate (Kent, United Kingdom) and deceased 30 December 1947 at Cambridge (Massachusetts, United States), Whitehead attended the Sherborne public school (Dorsetshire) where "classical studies were interspersed with mathematics" (*ESP* 6) before entering Trinity College in 1880 with a scholarship in mathematics. In 1884, he was elected Fellow in Mathematics with a dissertation (now lost) on Maxwell's *Treatise on Electricity and Magnetism* (1873) and started teaching mathematics and mathematical physics. In 1905, he received a Doctor of Science degree on the basis of his *Universal Algebra* (1898) and of his four *American Journal of Mathematics* papers (1901–1904). In 1910 he resigned his Lectureship and moved unexpectedly to London, where he was an independent scholar for a year, then taught at University College London for three years and moved finally to the Imperial College of Science and Technology (London), where he taught the same subjects until 1924. According to the chronology Victor Lowe masterfully established, President A. Lawrence Lowell wrote formally to Whitehead on February 6, 1924 to invite him to teach philosophy at Harvard University.[3] Although the matter was in the air—at least within Harvard's "Royce Club"—since 1920 and an informal inquiry took place in January 1924, it seems that the formal invitation was a "complete surprise" for Whitehead and that he was immediately very enthusiastic: "I would rather do that than anything in the world," he said to his wife.[4] The Whiteheads left on August 15 and reached Boston on August 27. He started to lecture on September 23 at the Department of Philosophy, which was probably expecting only classes and new publications in logic and the philosophy of natural sciences. Whitehead, however, immediately embraced a far more *speculative* standpoint that became straightforwardly metaphysical one year later when he published the course of lectures he had given at the Lowell Institute (upon the invitation of A. L. Lowell, who was then the sole trustee of the Institute). Emeritus in 1937, Whitehead continued to work at a slower pace until his death. Upon his request, all his unpublished papers, letters and notes were burned either by Weiss or by Hartshorne.[5] He was cremated and his ashes scattered in the graveyard of Harvard's Memorial Church where a service was held for him on 6 January 1948.

Whitehead's lasting philosophical outlook is characterized by a constant desire to question the meanings of "simple obvious statements" (*R* 40) and to reorganise general ideas in order to attain higher orders of abstractions—while being critically aware of the limitations of language. This twofold tension nourishing his speculations can be specified as follows: towards a radical empiricism on one hand, and a complete formalism on the other.[6] One can see, in other words, that the so-called Analytic-Continental divide has *always already* been obsolete for Whitehead.

His turn towards a radical empiricism is informed essentially by a pluralism and an attention to the interconnectedness of events. Of course, it is somewhat daring to speak of a Whiteheadian radical empiricism before 1924, but this becomes nevertheless possible because of the importance of relations in all his writings. In order to understand what is at stake, a short Jamesean digression would be needed: this can be found in the introduction to the "Consciousness in Process" section of our "Panpsychism in Action" entry in this volume.

The other trend in Whitehead, towards a complete formalism, took on various guises during his career. His formalizations remained indeed open to the conceptual revolutions of his time: the early Whitehead is particularly sensitive to the recent foundational developments in algebra and geometry; his middle period particularly tackles electromagnetism (including the nascent quantum mechanics, as in Planck, Einstein, and Bohr) and Einstein's theories of relativity (including Poincaré and Minkowski); the late Whitehead also shows the influence of contemporary thinkers like S. Alexander, H. Bergson, F. H. Bradley, C. D. Broad, J. Dewey, L. J. Henderson, W. James, J. McTaggart, G. H. Mead, G. Santayana, and, of course, B. Russell.[7] In the background, the systems of Plato, Aristotle, Descartes, Galileo, Hume, Kant, Leibniz, Locke and Newton stand out as well. Needless to say, both lists are not exhaustive, especially because Whitehead was an introvert by temperament and does not always reveal his influences, because his library was dispersed on the occasion of his several moves, because of the change of orientation of his research program and, finally, because of the clauses of his will. Unfortunately, a treasure chest such as the one his good friend Keynes discovered in 1936 with all Newton's unpublished manuscripts does not seem to be available.[8]

The development of his thought can be divided into three periods which exemplify his lasting outlook in different ways, placing emphasis respectively on logic, epistemology, and metaphysics. An examination of these three "canonical" epochs reveals that Whitehead respectively contemplates (i) the logico-mathematical field *sub specie totalitatis*, where he aims at the ultimate generalities (for which reason the logicist program was once appealing to him) *and* at disclosing reality's fundamental pattern (for which reason we can speak of his formal *ontology*[9]); (ii) geometry as a physical science, both in the sense that geometry frames common sensical perception and science *and* that it can be extracted from them; and (iii) metaphysics under the category of creativity for, *prima facie*, *Process and Reality* indeed offers a genetic calculus of creative intension (for which reason one can speak of an *existential* ontology[10]) but it works hand-in-hand with a morphological calculus of created extension. There is thus a common double thread or root-metaphor to these three dimensions—the assessment of the questions of uniform (spatial) extension and of relationality—that boils down to one single character, broadly understood: relativism. Formalism is always only a tool (an *organon*) to come to terms with reality understood from the standpoint of a relationist theory of extension.

More precisely, one finds the same Fregean pattern throughout Whitehead's development: a primitive polyadic relation operating upon a field of relata or domains.[11] *Polyadic* is used here in the sense that the basic dyadic relation (of the type aKb) is activated in a web of relationship (it is the case that aKb, but also that aKc, aKd…). Besides, the relation is sometimes generalized, as in the case of *MCMW's* pentadic relations. The three emblematic works are *UA*,

PNK and *PR* (*MCMW's* 1905 "Theory of Interpoints" providing the continuity seemingly interrupted by *PM*).

In *UA*, rules of equivalence and of derivation (such as addition or multiplication) operate on a Grassmannian-Riemannian manifold of regions. The immediate goal is to elucidate the ontological weight of Maxwell's equations. Uniformity is treated with the concept of equivalence grounded in linear strains.

In *PNK*, the (mereological) relation of extension operates on the continuous field of events. The goal is to supply the foundations of sense-perception, as it is exploited by common-sense and by the sciences: hence the "method of extensive abstraction" using the notions of "convergence" and "equivalence class" (directly imported from the *Principia Mathematica*, probably under the influence of Frege's works). Uniformity is treated with the concept of congruence that provides the framework for understanding coincidence, recognition and measurement.[12]

PR introduces the relation of extensive connection operating on regions. Its purpose is to display the gearing of actuality *per se* or existence (which is subjective and qualitative) and of the various layers of potentiality or being (basically objective and quantitative). *PR* thus transcends Whitehead's previous *formal* ontological standpoint with a proper *existential* ontological standpoint. Uniformity is again treated with congruence, which is conditioned by ovateness.[13] Furthermore, whereas previous systematic attempts bore the obvious seal of other mathematicians and physicists, Whitehead is here tapping his *own* resources (besides the reference he makes to Th. de Laguna) and drawing the metaphysical consequences of his adoption of an epochal theory of time.

Yet another way of sketching the developmental trajectory would be as follows: in Cambridge, Whitehead focused on the *a priori* knowledge that can be extracted from the knower; in London, on the *a posteriori* knowledge imposed by the known; while in Harvard, he attempted a synthesis of the knower and the known.[14]

Let us now peruse the main publications of the philosopher; we lay particular emphasis on the works that are somehow less extensively treated later in this *Handbook*.

1.1. Cambridge, U.K. (1880–1909)

A Treatise on Universal Algebra (1898) was Whitehead's first book. It is largely based on a thorough investigation of Grassmann's calculus of extension (*Ausdehnungslehre*, 1844), Hamilton's *Quaternions* (1853), Boole's algebra of logic (*Symbolic Logic*, 1859), Benjamin Peirce's *Linear Associative Algebra* (1870) and Riemann's Manifold ("Über die Hypothesen, welche der Geometrie zu Grunde liegen," 1867). Furthermore, as its title displays, Leibniz's shadow (under the guise of the "Ars combinatoria") leads him to the quest of a "universal calculus to *facilitate* reasoning in connection with every province of thought, or of external experience." (One should note that Russell's and Couturat's Leibnizian inquiries are yet to appear.) His thesis is that mathematics (in its widest signification) is not simply the science of number and quantity, but a highly efficient universal engine of investigation of the possibilities of thought and reasoning: Whitehead's algebra avoids the restriction of variables to symbols for particular numbers (*cf.* his interest in projective geometry) to elaborate a fully-fledged logic of

propositions ("the sole concern of mathematics is the inference of proposition from proposition"). The planned second volume never appeared, being factually replaced by the co-authorship of the *Principia Mathematica*. On *UA*, see especially Dawson's and Valenza's entries in Part XVII, Volume II.

"On Mathematical Concepts of the Material World" (1905) is a cautious comparative study of five logical constructs describing the possible ways of conceiving *a priori* the structure of the physical world. It is written with the reformed symbolism of the forthcoming *Principia* (itself based on Peano's conventions, which were inspired by Frege's). Whitehead looks for nothing less than the "fundamental relations" acting between "ultimate existents." The monograph launches the trenchant criticism of Newtonian materialism that will mainly occupy his next periods, and introduces various other forthcoming features as well, such as the "theory of interpoints," which clearly anticipates his "method of extensive abstraction." The background to this work is James Clerk Maxwell's thought and the natural philosophy (in the loose sense of the word) of John Henry Poynting, Joseph John Thomson and Joseph Larmor, as well as the work of George Gabriel Stokes, William Thomson (later known as Lord Kelvin) and Peter Guthrie Tait. On *MCMW*, see especially the entries by Gaeta, Gerla and Miranda in Part XVII, Volume II.

Russell came up to Trinity in 1890 and followed Whitehead's and J. Ward's lectures. In 1897 appeared his *Foundations of Geometry*; in 1903, he published *The Principles of Mathematics* and soon discovered the possibility of a synergy between his planned second volume and the second volume of the *Universal Algebra* that was still in the air. As a result, the authors decided to unite their efforts. *Principia Mathematica*'s bold program of deducing mathematics from a set of logical axioms stems from the above mentioned works plus Peano's theory of natural numbers (*Arithmetices principia nova methodo exposita*, 1889; *Formulario di mathematico*, 1895), Cantor's transfinite arithmetics (*Grundlagen einer allgemeinen Mannichfaltigkeitslehre*, 1883) and Frege's foundational inquiries (*Grundlagen der Arithmetik*, 1884). According to Russell, Whitehead especially contributed the treatment of "apparent variables" (*PM* IB), "identity" (IB), "cardinal arithmetic" (Parts II & III), "convergence and limit of functions" (VC), and "quantity" (VIB & C). He concludes: "In most parts of the book, there was, in the end, very little for which either had sole responsibility."[15] On the whole, Whitehead was especially active in Parts II (where he was responsible for the blunder on the nature and number of individuals), V, and VI. On *PM*, see especially Grattan-Guinness' entry in Part XVII, Volume II.

Thanks to Gödel's Incompleteness Theorem, it is now accepted that logicism—the understanding of arithmetic (and much more of mathematics) as an extension of deductive logic—is mistaken. However, *Principia Mathematica* remains an intellectual landmark of the twentieth century, not only for its famous Theory of Types, but also as the final (though not the first) break with the Aristotelian subject-predicate logic.

An Introduction to Mathematics (1911) is a popularizing work laying stress on the empirical basis of mathematics. It constitutes a straightforward introduction to the methods and applications of mathematics (broadly understood). Written for the layman, it is nevertheless quite illuminating regarding Whitehead's lasting philosophical outlook.

The fourth volume of the *Principia* was supposed to be written by Whitehead alone. In order to be able to properly discuss the geometry of the world, around 1905 he launched a series of new inquiries, that would culminate in a personal reassessment of Einsteinian relativity (i.e., the replacement of the real curvature of space-time by multiple time-systems constituting a flat or pseudo-Euclidean space-time). In other words, the completion of the *Principia* is simply postponed and he begins his journey in epistemology. The genesis of non-Euclidean geometries (Gauss, Lobachewsky, Bolyai, Riemann, Helmholtz) had occupied Whitehead during his entire life; now he went on to exploit philosophically the concepts of "field" and "vector" as well.

1.2. London (1911–1924)

The London years saw the publication of three books of similar inspiration: *An Enquiry Concerning the Principles of Natural Knowledge* (1919, 2nd. ed., 1925), *The Concept of Nature* (1920), and *The Principle of Relativity. With application to Physical Science* (1922). Their goal is to be useful for mathematicians, scientists *and* philosophers. Throughout their respective developments, the basic questions remain: what is "Nature" (i.e., the object of perceptual knowledge); how are time and space rooted in direct experience; and what shape could (should) the simplest generalization take from immediate evidence? The answer takes the form of a careful study of the presuppositions of modern science, with special attention given to Newton, Maxwell, Larmor, Lorentz, Minkowski and Einstein. Whitehead insists on the necessity of satisfying *both* science and common sense. Hence the two main features of his epistemology: the systematization of the concepts of event and object, and their instrumentalization by the "Method of Extensive Abstraction," which constitutes a skilled generalization of the instinctive procedure of habitual experience in the light of the Fregean definition of cardinal numbers with equinumerical classes. Both features result from his denunciation of the "bifurcation of nature," i.e., of the Galilean dichotomization between nature as sensed and nature as postulated by science *and* of the subsidiary Lockean bifurcation between primary and secondary qualities. The substance-oriented physics, dualistic in essence, is utterly replaced by a physics of events, at three complementary levels: extension no longer expresses disconnection between substances but connectedness between events; instants are replaced by durations; and absolute space is replaced by a relational/connectionist account of spatio-temporality. On the works of the London period, see especially the entries of Part XVIII, Volume II.

In the Preface to the second edition of the *Principles of Natural Knowledge* (dated August, 1924—remember the Whiteheads left London for Liverpool on August 15 and reached Boston on August 27)—Whitehead was already stating that he hoped "in the immediate future" to embody the standpoint of his epistemological inquiries "in a more complete metaphysical study." And he did so in a rather revolutionary way. What begins to matter indeed is the intelligence of the ontological conditions of possibility of the "creative advance of nature." The full systematic—or rather, heuristic—answer will be given by *Process and Reality*; but three other works particularly matter: the pre-systematic *Science and the Modern World* and *Religion in the Making*, and the post-systematic *Adventures of Ideas*.[16]

1.3. Harvard (1924–1947)

Science and the Modern World (being the Lowell Lectures of 1925) embodies perhaps the first critical historico-conceptual study of the development of modern science ever, starting with the Greeks, surveying 2500 years of techno-scientific struggles with "stubborn facts," and devoting special attention to the Einsteinian upheaval and the nascent quantum mechanics. These lectures ran from February to March 1925 and were published—"with some slight expansion" according to *SMW*'s Preface—in October 1925. The added material consists of two generalist chapters that were delivered as lectures in other circumstances (Chapter II on *Mathematics as an Element in the History of Thought* and Chapter XII on *Religion and Science*) and two brand new chapters (Chapter X on *Abstraction* and Chapter XI on *God*), both especially reflective of an ontological orientation.

Science and the Modern World constitutes Whitehead's earliest careful exploration of the everlasting ontological problem—how to understand the "coming-to-be and passing-away" of actualities? Here he underlines his special indebtedness to S. Alexander and C. L. Morgan. The pure phenomenological standpoint of his previous period is no longer satisfactory, as it leads to the deepening of the event/object polarity with the actual occasion/eternal object polarity. On the one hand, the phenomenological continuous transition is so to speak atomized in ontological units of experience ("epochs"); on the other, the quasi-Platonic notion of eternal object embodies general potentialities. Moreover, the axiomatization of the process of actualization asks for a threefold immanent "principle of limitation" working together with a transcendent-immanent "Principle of Concretion"—God—grounding value and order in an eventful universe. The discussion of the concept of God occurs thus in a totally dispassionate context, independently of religious or even ethical concerns. What matters more is the "ontological priority" of flux over permanence and the grounding of actuality in a "sea" of potentiality. In any case, *SMW* constitutes without doubt a major step (not a leap) in Whitehead's conceptual development. [17]

Religion in the Making (being the Lowell Lectures of 1926, delivered in King's Chapel, Boston, and published in Sept. 1926) resumes the systematic task by naming the three "formative elements" implicit in *Science and the Modern World*: creativity or *substantial activity*, eternal objects or *pure possibilities*, and God or the *Principle of Concretion*. The *Timaeus*' categories are obviously still haunting his mind. In any case, it is the concept of religion that is in the hot seat here, both from the perspective of the relativity of first-hand and second-hand experiences (*cf.* James' *Varieties of Religious Experience*, 1902) and of the correlation between the history of religion and the general history of knowledge.

Science and the Modern World—and, to a lesser extent, *Religion in the Making*—were (and still are) well-sold books. Due to the topics they address and the treatment they accord them, they have usually been acclaimed by critics and welcomed by the general public as well as scholars. Partly historical and partly common-sensical, they could easily find an open-minded audience in Boston. Nevertheless, it is fair to recognize that, in comparison to *Process and Reality* (1929), these works were conceptually timid, simply because Whitehead had not yet thought his way to a coherent system. The main damper impeding his speculations was his

atavistic Platonism, itself induced by his Logicism and his Anglicanism. In other words, both because of his algebraic training and his Christian education, he was heavily subjected to the creed of the time: creationism (not in the contemporary meaning of the word). Creation is a *making* not a happening; it is *poietic*, not praxic.[18] It remains however of the highest importance to assess that conceptual reticence in order to understand *Process and Reality*'s drive. All the more so if one does not accept the thesis of the uttermost importance of the Gifford Lectures to understand what is at stake for their author: *SMW* (together with *AI*) become then the loci of the revelation of his late *worldview*.

An excellent introduction to Whitehead's *Weltanschauung* in general, and his epistemology in particular, can be found in his Barbour-Page Lectures of 1927, published under the title of *Symbolism, Its Meaning and Effect*.[19] *Symbolism* is noteworthy mainly for its introduction of Whitehead's mature analysis of sense-perception. Our experience, he claims, has three main modes, "each contributing its share of components to our individual rise into one concrete moment of human experience" (*S* 17). Two of these modes are perceptive, and the third one names the interplay between the former. The goal is to save "appearance" *and* "being," opinion *and* science. In respect to "pure (sense-)perception"[20] or "direct recognition,"[21] the philosopher distinguishes "causal efficacy" and "presentational immediacy," both constituting an objectification of the mundane tissue. On the one hand, in "perception in the mode of causal efficacy," we "conform to our bodily organs and to the vague world which lies beyond them" (*S* 43). In other words, we undergo the pressure of an external world which is both determined and *past* (*S* 44, 50, 55 and *PR* 178). That heavy and primitive experience (*S* 44) brings to the fore the meaning of our embodiment (the "withness of the body," as he will later call it), which is to root us deeply in the World. On the other hand, "perception in the mode of presentational immediacy" delivers a clear and distinct image of the *contemporary* world. An instantaneous cut-out presentifies (i.e. renders present) reality as an extensive pattern: determined items localized in a spatio-temporal continuum. This projection, in our present, is achieved with the (past) data delivered by causal efficacy. Its paradigm is sight and the coldness of its objectification: to locate is the act of sight itself. The intrinsic natural processuality is here obliterated; the World becomes stiff and lifeless, a mosaic of qualities spread out in front of an acosmic subject.[22] None of the two pure modes can be judged true or false, only their confrontation could: Aristotle saw it already, truth and falsehood are not "in" things, but in the synthesis made by the mind. In order to explain perceptual errors and other, more positive, degrees of freedom humans can enjoy with facts, Whitehead introduces "symbolic reference," which is the conscious synthetic activity whereby the two pure modes are "fused into one perception" (*S* 18). To mistake a square tower for a round one is to misinterpret what is actually given to us: although what is seen is undoubtedly a roundish object, the tower is indeed square and this fact cannot but be conveyed by causal efficacy. "Direct experience is infallible. What you have experienced, you have experienced" (*S* 6). The mistake lies in the *conscious judgment* claiming that this tower *is* round. His answer to Hume (and Descartes) is thus the following. Although it is with good reason that the Scot criticizes perception in the mode of presentational immediacy, his reduction of all possible perception to sensory perception (restricted to the five

senses) is mistaken. In sum: conscious perception is understood as "the symbolic interplay between two distinct modes of direct perception of the external world."[23]

The Aims of Education (1929) gathers addresses given between 1912 and 1928 (it actually recaptures most of the essays published in *The Organisation of Thought, Educational and Scientific*, 1917). The Preface summarizes the stakes: "The whole book is a protest against dead knowledge, that is to say, against inert ideas." According to Whitehead, "education is the acquisition of the art of the utilisation of knowledge" and such an art necessarily involves the uncompromising awareness of *duty* (that "arises from our potential control over the course of events") and *reverence* (which 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"[24]). Accordingly, he spells the rhythm of education in three phases: wild Romance, efficacious Precision and visionary Generalisation. On this, see especially the entries of Part VI, Volume I.

Process and Reality (being the Gifford Lectures of 1927–1928, published in December 1929)[25] disrupts *RM*'s threefold Platonic framework by reorienting it around the concept of "creativity." Although *Process and Reality* constitutes Whitehead's most imposing work, undoubtedly the acme of his speculations, it was—and is still—badly received and drastically misunderstood. Actually, Whitehead wrote to his son North: "I do not expect a good reception from professional philosophers."[26] As a matter of fact, the Lectures were a debacle, and the book itself is usually fragmented in order to make it sizeable for hurried readers. It constitutes of five strictly interdependent parts: I. "The Speculative Scheme;" II. "Discussions and Applications;" III. "The Theory of Prehensions;" IV. "The Theory of Extension;" and V. "Final Interpretation." Part One includes the famous "categoreal scheme" that is "practically unintelligible" unless studied along with the rest of the book. Part Two (which is the weakest) mainly studies the Classics and Kant from the perspective of its reformed subjectivism. Part Three analyses "genetically" the coming into existence of new actualities. Part Four analyses "coordinately" the being of actualities (and defines straight lines without reference to measurement). Part Five reinterprets the ontological system so far adumbrated, starting with the rebalancing of the God/World relationship.

The ill-success of *Process and Reality* seems to have suggested a renewal of the expository style of *Science and the Modern World. Adventures of Ideas* (1933) elucidates the main categories of *Process and Reality* with the help of a vast picture of the major ideas haunting civilizations. We have here not only a philosophy of history emphasizing the concept of persuasion, but also an assessment of the impact of the scientific worldview on European culture and a renewed exposition of the ontology of process. According to the philosopher, a civilized society is to exhibit the qualities of Truth, Beauty, Adventure, Art, and Peace. See especially on this Allan and Henning entries, respectively in Parts II and VII of this volume.

The Function of Reason—being the Louis Clark Vanuxem Foundation Lectures delivered at Princeton University, March 1929—constitutes Whitehead's most valuable meditation on the complementary topics of Darwinian evolution and Jamesean Pragmatism. It is structured in a remarkably dialectic way: it first introduces the pragmatic function of reason, then its theoretical function, and lastly its (hyperdialectical[27]) theoretico-pragmatic one. The first definition

Whitehead gives of *the function of Reason* is "*to promote the art of life*" (*FR* 4). Although this is promptly reformulated as "the direction of the attack on the environment,"[28] the philosopher remarks that life should not be equated with survival as such: mere persistence is nothing but death.[29] *Life* should be approximated by three concepts that will be evoked again with the introduction of the "creative advance of nature": self-enjoyment, creativity and aim. But there is a second, equally important, function of reason: the speculative one, which is far less focused on immediate issues and attempts to grasp the overall picture. It is a "godlike faculty which surveys, judges and understands" (*FR* 9). The pragmatic function is rooted in our animal life (this being *not* a derogative statement), the speculative one in civilization. The former promotes *life* in all its dimensions; the latter, *science* and its disinterested quest. However, neither life nor science has the last word in Whitehead's Victorian optimism: Ulysses and Plato pave together the way for James Watts' (1736–1819) *techno*-science. With technoscience, a synergy is established between the archaeological propensity of speculative systematization and the consequentialism of pragmatic thought. In a somewhat Kantian manner, Whitehead insists on the complementarity of the two functions: methodology and direct observation derive from the practical side[30] while the global imaginative standpoint needed to pilot it and the emphasis upon novelty[31] are theoretical. On pragmatism and process, see especially Allan's entry in Part IX of this volume.

Modes of Thought (1938) gathers together Whitehead's last lectures, spread over the years 1924–1938. Their main object is to bring to the fore the presuppositions and oversimplifications that underlie abstractions, whether they be everyday, commonsensical patterns of thought or elaborate scientific systematizations. Whitehead shows, with the help of the concepts of importance, interest, discrimination and perspective, that there is a continuous gradient from the infinite unity or connexity of all events to the individual, finite, selectiveness of enjoyment of conscious actualities. By the same token, he insists on the difference between intuition, thought, and language and contrasts the sheer, vibrant disclosure of stubborn facts with their symbolization in science, philosophy, poetry and mysticism. Ideals can mask the concrete, well placed abstractions never.

"Autobiographical Notes," "Immortality," and "Mathematics and the Good," first published in the Schilpp volume devoted to *The Philosophy of Alfred North Whitehead* (1941; reprinted in his 1947 *Essays in Science and Philosophy*), constitute his last major publications. All three make the same plea for relativism in *PR's* reformed sense of the term and for its direct correlates pattern and rhythm. First of all, Whitehead makes clear that his thought has always been anchored in his vivid knowledge of history and in plain conversation, both common-sensical and technical, with colleagues, students and friends. Second, the Uni-verse is understood as the interplay between two "Worlds," the World of Active Creativity and the World of Timeless Value. The former is the World of origination of patterns of assemblage that nevertheless develops Enduring Personal Identity. The latter is timeless and immortal, but it nevertheless seeks Realization. In sum: neither finitude nor infinitude are self-supporting; fact and value require each other—and "exactness is a fake."[32]

2. Whitehead's Legacy

It is well known that until recently Whitehead has kept a fair visibility only in Protestant natural theology and mainly in the United States. There is however nowadays a (re-)discovery of Whitehead in philosophical and scientific circles: below, we propose a brief overview of the Whiteheadian legacy and list a few of the most recent promising development in Europe, Asia and Africa.

2.1. United States

The propagation of Whiteheadian organic philosophy outside Harvard was first due to Henry Nelson Wieman (1884–1975), who did not study under Whitehead but introduced, as early as 1926, the standpoint of *Religion in the Making* to Chicago's *Divinity School*, whose tradition was, from its founding in 1890 by William Rainey Harper (1856–1906) until the early 1950s, *empirical* (or *natural*) theology. There has been, as a result, a steady interest in Whitehead among theologians, first at the University of Chicago, later at the Claremont School of Theology (Claremont, California). Charles Hartshorne (1897–2000), Daniel Day Williams (1910–1971), Bernard MacDougall Loomer (1912–1985)—who is likely to have coined, for better or for worse, the term "process thought"—and Bernard Eugene Meland (1899–1993) rank among the first wave of these impressive Whitehead-inspired scholars. In the sixties emerged John B. Cobb, Jr. (1925–) and Schubert M. Ogden (1928–). Cobb's *Christian Natural Theology* (1965/2007) remains a landmark in the field. The journal *Process Studies* was created in 1971 by Cobb and Lewis S. Ford (1933–); the *Center for Process Studies* was established in 1973 by Cobb and David Ray Griffin (1939–) in Claremont. The result of these developments was that Whiteheadian process scholarship has acquired, and kept, a fair visibility only in North-American natural theology.

Whitehead's *philosophical* legacy was far less unified, though it too was a lively one. Willard Van Orman Quine (1908–2000), the most famous of Whitehead's students with Bertrand Russell—and who belongs after all to the formative phase of a new (analytical) ontology—did not follow the speculative path of his mentor. Neither did Paul Weiss (1901–2002), who apparently finally repudiated completely the philosophy of organism. Other past students like William Ernest Hocking (1873–1966), Filmer Stuart Cuckow Northrop (1893–1992), Suzanne Katherina (Knauth) Langer (1895–1985), Victor Augustus Lowe (1907–1988), Joseph Gerard Brennan (1910–1977), Max Harold Fisch (1901–1995) or Allison Heartz Johnson (1910–1973) never kept the argumentative pressure high enough—or federated their efforts enough—to promote the ideas of their teacher the way theologians did. Neither did prominent philosophers like Wilbur Marshal Urban (1873–1952), Sydney Ernest Hooper (1880–1966), Lizzie Susan Stebbing (1885–1943), William Armistead Christian (1905–1997), Milič Čapek (1909–1997), Ivor Leclerc (1915–1999), William Norris Clarke (1915–), Nathaniel Morris Lawrence (1917–1986), George Louis Kline (1921–), Walter Eliott Stokes, S.J. (1923–1969) or Robert Monroe Palter (1924–).

Founded in 1966, the *Society for the Study of Process Philosophies* (http://www.processphilosophies.org) was one of the first satellite organizations of the

American Philosophical Association. The SSPP holds periodic meetings in conjunction with each of the divisional meetings of the American Philosophical Association, as well as at the annual meeting of the Society for the Advancement of American Philosophy. The SSPP is presently coordinated by Jude Jones with the associate director Brian G. Henning.

2.2. Europe

From a European perspective, there was a very significant and often early Whiteheadian influence on the works of outstanding scholars like Henri Bergson (1859–1941), Émile Meyerson (1859–1933), Louis Couturat (1868–1914), Jean Wahl (1888–1974), Robin George Collingwood (1889–1943), Philippe Devaux (1902–1979), Hans Jonas (1903–1993), Dorothy M. Emmet (1904–2000), Maurice Merleau-Ponty (1908–1961), Enzo Paci (1911–1976), Charlie Dunbar Broad (1887–1971), Wolfe Mays (1912–2005), Ilya Prigogine (1917–2003), Jules Vuillemin (1920–2001), Jean Ladrière (1921–2007), Gilles Deleuze (1925–1995), Wolfhart Pannenberg (1928–) and Reiner Wiehl (1929–), but all have kept their own speculative trajectory. (Russell's case is again too complex to be addressed here.)

Louvain's *Center for Metaphysics* maintains Whiteheadian archives, established by Jan Van der Veken (1932–) in 1977 with the help of Claremont's *Center for Process Studies* and now directed by André Cloots (1948–); it is also the host of the *European Society for Process Thought*, created November 10th 1978, on the occasion of the bestowal of a honorary doctorate on Charles Hartshorne.[33]

2.3. Recent Evolution

Recent years have seen the revival of the interest in Whitehead's philosophy, either directly (through the interpretation of Whitehead *secundum* Whitehead) or indirectly, because of debates around problematic epistemological knots (such as interpretational problems in quantum mechanics or in relativity, and chronic difficulties such as the so-called mind-body problem), on the occasion of the reassessment of "great classics" such as Locke, Hume and Kant, or because of some currently fashionable work, e.g. in France, through Gabriel (de) Tarde (1843–1904), Gilbert Simondon (1924–1989) and Gilles Deleuze (1925–1995). Furthermore, Whitehead's anticipating insights on the convergence of fields like "gender studies" and "sociology of science" remain fascinating:

> Except for plain, overmastering reasons connected with the necessary efficiency of Government, it is a crime against Liberty deliberately to deprive any portion of the population of possibilities of political action. That such overmastering reasons for limitation of political functions do exist in many states, perhaps in all states, I am not concerned to deny. They may arise when there is a cleavage in the population produced by inferiority of race, inferiority of civilization, or by deficiency of goodwill.[34]

Here is a brief sketch of the recent major international initiatives.

The *Japan Society for Process Studies* was established on December 8, 1979. Its current president is Haruo Murata (Aomori Public College). The secretariat of JSPS is located at Hitoshi Hongo's office at Tokyo Denki University. Tokiyuki Nobuhara (who is also chairing the East-West Process Studies Project since 1985) acts as project director. The JSPS fosters three study groups—in Tokyo (leader: Chuichiro Hirose, Canon University), in Kyoto (leader: Eiko

Hanaoka, Nara Industrial University), and in Nagoya (leader: Yasuto Murata, Nagoya Ryujo Junior College)—and a journal, *Process Thought* (editor: Yutaka Tanaka, Sophia University), that has just published its 13th issue last fall. On September 2007 JSPS had its 29th Annual Convention at Doho University, Nagoya with a special symposium on "Whitehead and Peace" as its focus. Isami Nagami (Nagoya Ryujo Junior College), Tsugiko Sakai (Tokushima Bunri University), Shigeyuki Itoh (Kyushu Industrial University) were speakers, with Tokiyuki Nobuhra (Keiwa College) and Masaharu Hishiki (Doho University) playing the roles of comentator and presider. Hiroshi Endo (Waseda University emeritus) delivered a keynote lecture on "Whitehead's Metaphysics."

The *Australasian Association for Process Thought* (www.processthought.org) was formed in 1996 by process philosopher and theologian Greg Moses and computer scientist Peter Farleigh, with support from biologist and writer Charles Birch and humanities professor Wayne Hudson. The aim of the organisation is to promote the study of the process-relational thought of Alfred North Whitehead and Charles Hartshorne in the Antipodes. Membership consists of philosophers, scientists, medics, psychologists, clergy, students, and other interested scholars from all over Australia, New Zealand and Papua New Guinea. In June 2000 the AAPT launched an on-line peer-reviewed journal called *Concrescence* (www.concrescence.org) and in 2005 members of AAPT created a new peer reviewed on-line journal: *Cosmos and History: The Journal of Natural and Social Philosophy* (http://www.cosmosandhistory.org). Learned papers are invited on all subjects addressing the problems and issues in process-relational metaphysics. The journals provide a forum for exploring a broad range of issues in this speculative or revisionist field, but not ignoring critical and analytical methods: from the philosophy of science to theology, from environmental ethics to politics, from historical analyses to contemporary issues.

The *Whitehead Society of Korea* (http://whitehead.or.kr/) was created in 1997 after a research stay of Wang Shik Jang in Claremont. The WSK held its first conference at Yonsei University in Seoul on March 29, 1997. It is currently chaired by Chang-Ok Mun.

The *Whitehead Psychology Nexus* scholarly society was created in October 2000 by Michel Weber. It is an international open forum dedicated to the cross-examination of Whitehead's "organic" or "process" philosophy and the various facets of the contemporary psychological field. It seeks to encourage psychology in a Whiteheadian atmosphere and Whiteheadian scholarship informed by psychology. Bold speculations balanced by "complete humility before logic, and before fact" are especially valued. "It is a disease of philosophy—stresses Whitehead—when it is neither bold nor humble, but merely a reflection of the temperamental presuppositions of exceptional personalities" (*PR* 17). Openness means here—at the very least—two things. With regard to the focus of the evoked cross-elucidation: no philosophical or psychological system of thought is a priori excluded, provided that they allow discussion in a Whiteheadian spirit. With regard to the membership: ideologies and other forms of dogmatism are the only approaches which are not welcomed at the present. See www.chromatika.org.

The *International Process Network* (IPN) was created in Claremont in January 2001. It is a global network for process-relational philosophies governed by a multi-cultural and interdisciplinary board. IPN's purpose, as stated in its bylaws, is "to support, generate and

disseminate an international discourse on the meaning and implications of process thought across academic disciplines and conflicting truth-claims, and in relation to the entire community of life and the cosmos." Membership in IPN is available to individuals and organizations who are interested in understanding, teaching, developing, applying, promoting or supporting *process*. See www.processstudies.org.

The *Chromatiques whiteheadiennes* scholarly society was created in January 2001 by Michel Weber. It has since been incorporated as a non-profit organization that regroups the *Chromatiques*, the *Whitehead Psychology Nexus* and the *European William James Project*. The *Chromatiques* network itself intends to bring together research on the different aspects, nuances and implications of Whitehead's thought. Since 2002, the network has fostered in Paris 1 Panthéon Sorbonne research seminars on Whitehead's organic philosophy. The *Chromatikon Yearbook* publishes the main results of this work and also offers critical studies and reviews in Whiteheadian and related fields. It complements the monographs and proceedings published in Ontos' "Chromatiques whiteheadiennes" and "Process Thought" series. Since December 2007, the society has activated its own publishing company—Les Éditions Chromatika / Chromatika Editions—with two volumes presently available. See www.chromatika.org.

A *Research Chapter for Applied Process Thought* was created in 2002 in the University of St. Andrews by Mark Dibben. The Chapter has since then moved to the National University of Ireland, Maynooth, under the leadership of Thomas A. F. Kelly.

Thanks to Zhihe Wang's intercession, no less than fourteen centers devoted to process thought were open recently in the People's Republic of China: *Beijing Center for Process Philosophy* (2002), *Wuhan Center* (Process Philosophy, 2002), *Xian Center* (Process Philosophy, 2003), *Beijing Center for Process Thinking* (2004), *Yancheng Center* (Process Education, 2005), *Suzhou Center* (Process Philosophy, 2005), *Zhanjiang Center* (Process Education, 2005), *Hangzhou Center* (Process Theology, 2005), *Shangdong Center* (Process Psychology, 2005), *Tianjin Center* (Process Education, 2005), *Shenyang Center* (Process Ecology, 2007), *Heilongjiang Center* (Process Philosophy, 2007), *Guilin Center* (Constructive Postmodern Culture, 2006), and *Shanghai Center* (Sustainable Urbanization, 2007). Some of them were open on the occasion of a conference co-organized with Claremont's China Project and the Institute for Postmodern Development of China. The topics included, e.g., philosophy, Sustainable Urbanization, education reform, the dialogue between Science and spirituality, social responsibility in business, land and Social Justice, and postmodern law, management.[35]

The Polish *Whitehead Metaphysical Society* was founded in 2003 and registered in October 2005. It was founded by a group of twenty Polish philosophers in order to support the development of Whiteheadian metaphysics. The Society organizes an annual conference in May (usually in Polish)[36] and publishes the *Studia Whiteheadiana* (issue 1, 2003; 2, 2006; 3, 2008). The contact person is: Bogdan M. Ogrodnik (Silesian University), bogrod@interia.pl.

The *Hungarian and Central European Whitehead Society* (Budapest) was established in 2003. It organizes monthly discussions, inviting not only philosophers, but also experts from areas like theology, informatics, psychology, sociology, history, art etc. Two members of the society translated *Process and Reality* (published by Typotex, 2001): László Fórizs and Gábor Karsai. In 2007 the *Concept of Nature* was published in Hungarian (Typotex, 2007, translated by

Levente Szabados) and Studies on process philosophy were published (*Process and Adventure*, Veszprém, 2006, edited by Ella Csikós and Gábor Karsai). Every summer a "Whiteheadian camp" takes place at lake Balaton, with lessons and cultural programs. Web site: http://whitehead.fw.hu/; e-mail: info@whitehead.hu.

The *Whitehead Research Project* (WRP), established by Roland Faber in 2007, heralds the forthcoming *Whitehead Research Institute*. It is dedicated to the research of, and scholarship on, the texts, philosophy and life of Alfred North Whitehead. It explores and analyzes the relevance of Whitehead's thought in dialogue with contemporary philosophies in order to unfold his philosophy of organism and its consequences for our time and in relation to emerging philosophical thought. Of particular interest is the investigation of the emergence of Whitehead's philosophy in the context of British and American pragmatism, its relation to Continental philosophy and the analytic tradition, the relevance of his thought in the discourse of post-modern paradigms of deconstruction and post-structuralism, and its creative impulse for developing process philosophies. Additionally, following Whitehead's own inclination to reach beyond European modes of thought, WRP seeks to extend its horizon of research by fostering similar conversations with strains of Indian and East Asian thought, thereby exhibiting de facto mutual influence—e.g., with the Kyoto School of Buddhist philosophy.

The Bulgarian Center for Process Studies was established officially on November 2007 with the help of Claremont's CPS. It is a branch of the Bulgarian Ontological Society. Its president is Vesselin Petrov (who is also the head of the Bulgarian Ontological Society), and its secretary is Stefan Dimitrov. It is currently establishing synergies with its Romanian Hungarian counterparts. E-mail: ontologichno_obshtestvo@mail.bg.

In April 2008 a Whiteheadian research center was opened in the Faculty of Letters and Social Sciences of the "Constantin Brancusi University" (Romania). Its Honorary President is Bertrand de Saint-Sernin, professor emeritus of Paris IV–Sorbonne. Its President is Prof. Adrian Gorun, Ph.D., President of CBU and secretary general of the Romanian Department of Education. The research center will have a globalist approach in the field of research and will focus on strengthening the academic relations with the other Whiteheadian centers in Europe and USA. E-mail: ccuteanu@gmail.com.

In Africa, there has been a constant interest in Whitehead since the seventies with the works of Mgr Tshishiku [Tharcisse] Tshibangu, who found his main inspiration in Whitehead, Yves Congar and Jean Ladrière.[37] Joseph Mabika Nkata,[38] Alphonse Ngindu Mushete[39] and David Ongombe Talhuata[40] are continuing Tshibangu's initial exploration of the bridges between organic/process philosophy and African theologies and worldviews. A *Centre Monseigneur Tshibangu. Métaphysiques—Sciences—Théologies* was planned back in 2005 in the Université de Lubumbashi, R.D. Congo but, sadly, ethnic problems apparently make its opening currently impossible.

Given all these developments across the globe, the current optimism in the process field is more understandable. Although this is not the time to denounce that optimism, one should place it within a larger context. There are indeed conceptual rhythms that frame the history of ideas and Whitehead would have insisted that there are still novel conceptual epochs to come. The contrast between pluralistic empiricism and dualistic rationalism is well-known (see for instance

the opening chapter of James' *Pluralistic Universe*) but is a bit too broad to allow the manipulation of an applicable picture. If we consider the last centuries of human thought, we have the following dialectical movement displaying a shift of epicentre from Italy to Germany and later to the Anglo-Saxon world (the latter constituting a far more diffuse entity because of its world-wide cultural hegemony). Whereas the Renaissance lauded the perfection of static proportions, Baroque art and thought, heir to the Counter-Reformation of 1630–1750, stressed movement, change and growth. The reaction of the *Aufklärung* was swift: secularization with its requirements of rationality, optimism and progress spread its dogmatic wings over the entire social landscape (remember Foucault's *grand renfermement*). With Romanticism, the emphasis returned to feeling, becoming and opacity (or inexhaustibleness: *cf. R* 15), sometimes even irrationality. Then the positivism of A. Comte and later the *Wiener Kreis* (soon to be exported to the USA) constituted a new *Kehre*, promptly counter-balanced by the first process publications of F. Nietzsche and É. Boutroux, but also of C. S. Peirce, W. James and A. N. Whitehead. In conclusion, process thinkers can be optimistic because their mode of thought has not yet developed all its potentialities or become generally recognized (although science is nowadays totally processual). But they should not be dazzled either: "in its turn every philosophy will suffer a deposition" (*PR* 7).

3. Handbook's Framework

We now specify the general policy followed by the *Handbook* and make explicit the nature of its thematic and biographical entries.

3.1 General Policy

Planning a *Handbook* covering the whole spectrum of Whitehead's *œuvre* required a very broad and ambitious framework. Given the complexity of the task—perusing all available Whiteheadian material as well as most of its roots and fruits—and the constraints lying upon it (such as the unavoidable obsolescence of the entries and the managerial decisions of the publisher), it makes no claim to completeness or objectivity: the editors only believe it to have reached a standard that should retain its authoritativeness for a good few years.

To achieve this aim, two main types of entries are proposed: thematic (Volume I, Parts II to XV and Volume II, Parts XVI to XVIII) and biographical (Volume II, Part XIX). It is well-known that much compromise is needed to balance the two requirements common to all collective works: first, the enforcement of clear criteria of convergence on all entries; second, the necessity to respect the creativity of all authors involved and thus to grant reasonable freedom of operation within the proposed structure. There is no contradiction here, however, for as Whitehead wrote concisely: "Each task of creation is a social effort" (*PR* 223). These boundaries, combined with the necessity to welcome not only confirmed Whiteheadians but "closet" Whiteheadians as well as scholars who were willing to contribute specialized entries, while so to speak on their way towards process thought, were especially restricting in the case of the biographical entries.

Finally, let us mention that this work will be furthermore complemented in the near future by the publication of *Creativity and its Discontents. The Response to Whitehead's Process and Reality*, edited by Alan Van Wyk and Michel Weber (Ontos, 2008), a book gathering and contextualizing all the major reviews (translated where need be) of *Process and Reality*: its original 1929 edition, its 1978 corrected edition and its various translations (some of which are still on-going).

3.2. Thematic Entries

Each thematic entry provides (i) a broad contextualisation of the issue at stake; (ii) a focus on Whitehead's treatment (if any) or of a possible Whiteheadian treatment of the issue; (iii) a history of relevant scholarship; (iv) a personal assessment by the Author; (v) a section with further essential readings. In some cases, it was expedient to propose two complementary approaches: an analytic entry following closely the above five steps, and a synthetic entry, focusing on the personal assessment of an important issue in the field.

Growing fields, such as "process economy" (6 entries), "philosophy of language" (5 entries), "public policy" (4 entries) and "psychology and the philosophy of mind" (7 entries) receive here close attention while well-established ones, such as "process theology" and "process metaphysics" are comparatively smaller. The reason is two-fold: precisely for these two fields, it proved quite difficult to gather innovative papers while novel publications such as the *Handbook of Process Theology* and the first volume of *Applied Process Thought*[41] provide fair recent syntheses.

Special attention has also been given to the evolution of the concept of *extension* in Whitehead's writings. For one thing, his treatment of extension is important in itself; for another, it is arguable that the core of *Process and Reality* lies in the togetherness of Parts III and IV. Since subjectivity and intensity require objectivity and extensity,[42] both Parts need to be read together to recreate Whitehead's vision. This foundational synergy has largely informed the argument of our recent monograph—*Whitehead's Pancreativism* (2006)—while it underlines Kraus', Nobo's and Jones' earlier analyses.[43] With the articulation of *PR's* intuition through the knower/known dialectic, Whitehead regroups two fields that were separated after the *Principia Mathematica*: one is the process legacy of thinkers such as Peirce, Bergson, James and Dewey; the other is the logical empiricism of Carnap and Quine (Frege being more a maverick). Fitch in 1957 was probably the first to understand this; Dumoncel, Shields, Lango, Lucas, Rescher and Seibt are recent exemplifications of the growing importance of formal *process* ontology.[44]

Bibliographies are gathered at the end of each Part under the title "Works Cited and Further Readings." This helps to avoid redundancy, to provide synthetic data and to optimize the use of space.

3.3. Biographical Entries

Biographical entries are of a rather obvious relevance in the context of a philosophical *Handbook*. There are, in addition, three specific Whiteheadian reasons to feature them: first,

they constitute a major avenue to unearth the presuppositions of our author and of his *Zeitgeist*. With regard to this, Whitehead wittily remarks:

> When you are criticising the philosophy of an epoch, do not chiefly direct your attention to those intellectual positions which its exponents feel it necessary explicitly to defend. There will be some fundamental assumptions which adherents of all the variant systems within the epoch unconsciously presuppose. Such assumptions appear so obvious that people do not know what they are assuming because no other way of putting things has ever occurred to them (*SMW* 48).[45]

To become aware of such a set of (possibly unconsciously) presupposed fundamental assumptions constitutes a necessary hermeneutical step. In philosophical parlance, this is the question of *doxa*, whose study reveals mainly two types of data: contingent and necessary ones, the latter leading straight to our second reason. Second, insights of past authors are of exceptional interest:

> Plato's contribution to the basic notions connecting Science and Philosophy, as finally settled in the later portion of his life, has virtues entirely different from that of Aristotle, although of equal use for the progress of thought. It is to be found by reading together the *Theætetus,* the *Sophist,* the *Timæus,* and the fifth and tenth books of the *Laws;* and then by recurrence to his earlier work, the *Symposium.* He is never entirely self-consistent, and rarely explicit and devoid of ambiguity. He feels the difficulties, and expresses his perplexities. No one could be perplexed over Aristotle's classifications; whereas Plato moves about amid a fragmentary system like a man dazed by his own penetration (*AI* 146-147).

Third, past architectonic attempts themselves constitute an important source of inspiration for a system-builder such as Whitehead. So when he claims that "the systematic thought of ancient writers is now nearly worthless; but their detached insights are priceless" (*ESP* 84), he is not to be taken *prima facie*. There is no contradiction here: his fascination for the fragile coherence of past ontologies (such as Plato's or Newton's) does not obliterate the requirement of applicability, that justifies his quoted claim.

In sum, it is possible to gain a good grasp of Whitehead's roots by studying the presuppositions he shares with his peers, the insights he reclaims and the systems he criticizes more or less subjectively. These routes of approximations should be illuminated by biographical entries providing (with the exception of some shorter notes) (i) a brief *vita* of the targeted thinker; (ii) a sketch of his/her categories relevant to Whiteheadian scholarship; (iii) a personal assessment of the possible Whiteheadian semantic transfer to or from the thinker; and (iv) a section with further essential readings.

The biographical entries are arranged in the following historical manner: Whitehead's Historico-Speculative Context, his Contemporaries, and his Scholarly Legacy (American and European).

Among the missing entries that were initially planned and should be provided in a second edition, we have essentially **(i)** Aristotle, Galileo (1564–1642), Descartes (1596–1650), Locke (1632–1704), Newton (1642–1727), Benjamin Peirce (1809–1880), George Boole (1815–1864), George Gabriel Stokes (1819–1903), Georg Friedrich Bernard Riemann (1826–1866), Peter Guthrie Tait (1831–1901), William Thomson, Lord Kelvin (1824–1907), James Clerk Maxwell (1831–1879), Friedrich Wilhelm Nietzsche (1844–1900), Gottlob Frege (1848–1925); **(ii)** Ernst Mach (1838–1916), Conwy Lloyd Morgan (1852–1936), Max Planck (1858–1947), Henri

Bergson (1859–1941), Ferdinand Canning Scott Schiller (1864–1937), Étienne Gilson (1884–1978), Charlie Dunbar Broad (1887–1971), Filmer Stuart Cuckow Northrop (1893–1992), Hans Jonas (1903–1993); **(iii)** Ian Graeme Barbour (1923–), Reiner Wiehl (1929–). The massive scale of a project that attempted to match all the facets of Whitehead's legacy within the constraints discussed above is the main reason for the inability to provide these entries on time.[46]

The Critical Apparatus is featured in Volume II; it consists of a General Bibliography, an Index of Subjects, an Index of Names and a Detailed Table of Contents.

In the same way that the *Culture-Bound Syndromes* have cast doubts on the comprehensiveness and objectivity of Western psychiatry, one could question the objectivity of a philosophical *Handbook* that leaves so little room to traditions that do not belong to the West. No doubt figures like Leonardo Boff (1938–), Nishida Kitarô (1870–1945) and Cheikh Anta Diop (1923–1986) were in the mind of many of the authors who have contributed, but actual allusions are scarce. Through that bias also, this *Handbook* embodies the current state of affairs in Whiteheadian scholarship. Provided that we remain fully conscious (not simply aware) of it, the adventure of thought will continue.

Is panic of error not "the death of progress; and love of truth is its safeguard" (*MT* 16)?

"Denken ist Danken." All the scholars involved in this long project have to be wholeheartedly thanked for their important input and for their generous collaboration. To Timothy L. S. Sprigge, Jean Ladrière, Peter H. Hare and Thomas A. F. Kelly, who have departed before seeing the *Handbook* published, I owe a very special thanks for their unflinching support in this as well as many other projects.

Notes

[1] Felix Frankfurter, in a Letter to the *New York Times* on January 8, 1948, reprinted as a Preface to the Mentor Book edition of Whitehead's *Aims of Education* (1929).

[2] *Cf.*, e.g., *R* 38 and *PR* 73 sq.

[3] Victor Augustus Lowe, *A. N. Whitehead. The Man and His Work*. Volume I: 1861–1910; Volume II: 1910–1947 (edited by J. B. Schneewind), Baltimore, Maryland and London, The Johns Hopkins University Press, 1985 & 1990. See also William Ernest Hocking's testimony in "Whitehead as I Knew Him," *Journal of Philosophy*, 58, 1961, pp. 505-516, reprinted in George Louis Kline (Edited and with an Introduction by), *A. N. Whitehead: Essays on His Philosophy*, Englewood-Cliffs, New Jersey, Prentice-Hall, Inc., 1963, pp. 7-17 (Corrected reprint: University Press of America, 1989).

[4] According to Lucien Price's *Dialogues of A. N. Whitehead*. Introduction by Sir David Ross, Boston/London, Little, Brown & Company/Max Reinhardt Ltd., 1954. We quote the reprint in Mentor Book, 1956, p. 14.

[5] Very few letters and papers escaped, mainly thanks to V. Lowe and B. Russell: they can be consulted in the Milton S. Eisenhower Library (Johns Hopkins University), in the Mills Memorial Library (McMaster University), and in the Haldane Archives (National Library of Scotland).

[6] This is also testified by Andrew Dawson (see his entry in Vol. II) and scholars such as Emmet (see her "A. N. Whitehead: The Last Phase," *Mind*, 57, 1948, pp. 265-274), Hocking (see his "Whitehead as I Knew Him," *op. cit.*), Allison Heartz Johnson ("Whitehead as Teacher and Philosopher," *Philosophy and Phenomenological Research*, Vol. 29, 1968-1969, pp. 351-376), and Joseph Gerard Brennan ("Alfred North Whitehead: Plato's Lost Dialogue", *The American Scholar*, 47, 4, 1978, pp. 515-524).

[7] Here the interplay between the speculations and personal lives of Russell and Whitehead is a subject unto itself, and one made all the more difficult because Whitehead left very few clues while Russell's numerous testimonies are often unreliable.

[8] John Maynard Keynes, "Newton, the man," in *The Royal Society Newton Tercentenary Celebrations, 15-19 July 1946*, Cambridge University Press, 1947, pp. 27-34. *Cf.* Loup Verlet, *La malle de Newton*, Paris, Gallimard, 1993.

[9] The well-known contrast between formal logic and formal ontology is Husserlian (see his *Logische Untersuchungen* III, 1900–1901, that, incidentally, also sketches a theory of part and whole), but it can be traced back to Aristotle and Grassmann, the later being extremely important to Whitehead.

[10] The contrast between formal and existential ontology is exploited in M. Weber's "*PNK*'s Creative Advance from Formal to Existential Ontology," in Guillaume Durand et Michel Weber (éditeurs), *Les principes de la connaissance naturelle d'Alfred North Whitehead—Alfred North Whitehead's Principles of Natural Knowledge*, Frankfurt, Ontos Verlag, 2007, pp. 259-273.

[11] The predicate Fregean is used loosely, especially since it is not clear to what extent Whitehead knew Gottlob Frege's works (esp. *Die Grundlagen der Arithmetik. Eine logische-mathematische Untersuchung über den Begriff der Zahl*, Breslau, Verlag von Wilhelm Koebner, 1884; "Funktion und Begriff," *Vortrag, gehalten in der Sitzung vom 9. Januar 1891 der Jenaischen Gesellschaft für Medecin und Naturwissenschaft*, Jena, 1891; "Über Sinn und Bedeutung," *Zeitschrift für Philosophie und philosophische Kritik*, Vol. 100, 1892, pp. 25-50) before the publication of Russell's *Principles of Mathematics* in 1903. James Bradley makes a similar claim in his "The Generalization of the Mathematical Function: A Speculative Analysis," in Guy Debrock (ed.), *Process Pragmatism. Essays on a Quiet Philosophical Revolution*, Amsterdam / New York, Rodopi, Value Inquiry Book Series 137, 2004, pp. 71-86.

[12] As *PR* 328 claims: "although 'coincidence' is used as a test of congruence, it is not the meaning of congruence."

[13] "The systematic character of a continuum depends on its possession of one or more ovate classes" (*PR* 307). For its part, the actual *meaning* of congruence requires the introduction of strain feeling (*PR* 330).

[14] *Cf. PNK* vii: "We are concerned only with Nature, that is, with the object of perceptual knowledge, and not with the synthesis of the knower and the known."

[15] "Whitehead and *Principia Mathematica*," *Mind*, Vol. LVII, N° 226, 1948, pp. 137-138; for a non-technical introduction to the *Principia*, see Whitehead's *Aims of Education* or Russell's *Introduction to Mathematical Philosophy*, 1919.

[16] Needless to say that our use of "pre-systematic" and "post-systematic" differs from Christian's (*cf.* "Some Uses of Reason", in Ivor Leclerc (ed.), *The Relevance of Whitehead. Philosophical Essays in Commemoration of the Century of the Birth of Alfred North Whitehead*, London/New York, George Allen and Unwin Ltd./Humanities Press Inc., 1961, pp. 47-89).

[17] With that regard, it is well-known that the standard interpretation of the development of his philosophy finds its basis and its major exemplifications in two cumbersome pieces of "evidence" allegedly haunting his corpus: on the one hand, the shift to ontological atomism and, on the other, the abolition of the category of conceptual reversion. We cannot argue here in detail that neither of these two so-called shifts are actual and that to claim the contrary endangers the achievement of any coherent interpretation of his system or even of its development. They are the product of dubious premises and lead to even more misleading interpretative consequences. As Lowe says: "Whether the method of higher criticism that biblical scholars applied successfully to the *Pentateuch* can be applied with comparable hope to an essay in cosmology written by one old man in the 1920s must be doubted" (V. Lowe, *Alfred North Whitehead*, *op. cit.*, II, p. 221). Suffice it to say that first, epochality does not amount to atomicity and that discontinuity does not *replace* continuity in his system (continuity is now understood in a contiguist manner); second, without reversion creativity is equivalent to substantial transformation. Both matters are transcendental: at one point, Whitehead left the question of the conditions of possibility of genuine eventfulness in brackets; later on, he made them explicit. See "Créativité et réversion conceptuelle" in Michel Weber et Diane d'Eprémesnil (éditeurs), *Chromatikon. Annuaire de la philosophie en procès—Yearbook of Philosophy in Process*, Louvain-la-Neuve, Presses universitaires de Louvain, 2005, pp. 159-174.

[18] See Michel Weber, "Concepts of Creation and Pragmatic of Creativity," Wenyu Xie, Zhihe Wang, George Derfer (eds.), *Whitehead and China*, Frankfurt / Paris / Lancaster, Ontos Verlag, 2005, pp. 137-149.

[19] The conclusions of *S* are synthetized in *PR*, mainly on pp. 117-125 and 168-183. Although *PR* contains the key to Whitehead's conceptual revolution, its study will probably be fruitful only if it comes after the contemplation of less technically dense material. Besides *S*, *FR*, *AE* and *MT*, Price's *Dialogues* are highly recommended (and it is a very interesting question, indeed, to determine why exactly some scholars have ridiculed that work).

[20] See, e.g., *S* 5, 40 and *cf.* also 17, 20, 53-56 and *PR* 168.

[21] *S* 7 and passim; *PR* 65, etc.

[22] "Une mosaïque de qualités étalée devant un sujet acosmique" (Maurice Merleau-Ponty, *Phénoménologie de la perception*, Paris, NRF Éditions Gallimard, 1945, p. 359). *Cf.* Hans Jonas, *Philosophical Essays. From Ancient Creed to Technological Man*, Chicago, University of Chicago Press, 1974.

[23] "There are, in this way, two sources of information about the external world, closely connected but distinct. These modes do not repeat each other; and there is a real diversity of information. Where one is vague, the other is precise: where one is important, the other is trivial. But the two schemes of presentation have structural elements in common, which identify them as schemes of presentation of the same world. There are gaps, however, in the determination of the correspondence between the two morphologies. The schemes only partially intersect, and their true fusion is left indeterminate. The symbolic reference leads to a transference of emotion, purpose, and belief, which cannot be justified by an intellectual comparison of the direct

information derived from the two schemes and their elements of intersection" (*S* 30-31; see *PR* 122-123). On all this, see especially Code's entry in Part XIV of this volume.

[24] *Cf. OT* 9-10 and 28 or *AE* 4 and 14.

[25] Whitehead sent the last proofs to Macmillan on Aug. 13, 1929. On Nov. 4 he wrote to his son North that he didn't expect a good reception from philosophers. We infer that since it was published in 1929, it had to be Nov. or Dec., together with *FR*. (See Lowe's bibliography, Vol. II, 252 and 339.)

[26] See Lowe's *A.N. Whitehead*, *op. cit.*, II, p. 252.

[27] "La mauvaise dialectique commence presque avec la dialectique, et il n'est de bonne dialectique que celle qui se critique elle-même et se dépasse comme énoncé séparé; il n'est de bonne dialectique que l'hyperdialectique" (Maurice Merleau-Ponty, *Le Visible et l'Invisible. Suivi de Notes de travail*. Texte établi par Claude Lefort, accompagné d'un avertissement et d'une postface, Paris, Éditions Gallimard, 1964, p. 129).

[28] "The primary function of Reason is the direction of the attack on the environment" (*FR* 8).

[29] "The art of persistence is to be dead" (*FR* 4).

[30] "Each methodology has its own life history. It starts as a dodge facilitating the accomplishment of some nascent urge of life. […] The birth of a methodology is in its essence the discovery of a dodge to live" (*FR* 18).

[31] "Reason is the organ of emphasis upon novelty. It provides the judgment by which it passes into realization in purpose, and thence its realization in fact" (*FR* 20). "Fatigue is the antithesis of Reason" (*FR* 23).

[32] "Immortality," p. 19; reprinted in *ESP* 96 and in *IS* 267; *cf. D* 176 and *ESP* 104. Elsewhere he advised "seek simplicity and distrust it" (*CN* 163; *cf. PNK* 76).

[33] Contact address: Centrum voor Metafysica en Wijsgerige Antropologie, Hoger Instituut voor Wijsbegeerte, Katholieke Universiteit Leuven, Kardinal Mercierplein 2, 3000 Leuven, Belgium; see www.espt.de.

[34] Alfred North Whitehead, "Liberty and the Enfranchisement of Women" [Cambridge, Cambridge Women's Suffrage Association, 1906], reprinted in *Process Studies* 7/1, 1977, pp. 37-39, p. 38.

[35] "Whitehead and China in the New Millennium," Beijing, June 17-20, 2002; "Marxism and constructive Postmodernism," Wuhan, June 21-22, 2002; "Educational Reform," Claremont, November 1-4, 2003; "Marx and Whitehead," Beijing, April 4-6, 2004; "Theoretical Innovation," Beijing, May 30-31, 2004; "Philosophy of Culture," Harbin, May 30-31, 2004; "Science and Faith in Global Context," Beijing, December 28-29, 2004; "Higher Education Reform," Yancheng, April 6-10, 2005; "Faith, Science and Environment," Beijing, August 7-8, 2005; "Science and Spirituality in the Postmodern World," Wuhan, October 11-13, 2005; "Toward a Sustainable Urbanization," Suzhou, October 14-17, 2005; "Sustainable Urbanization and Ecological Civilization," Shanghai, October 18-19, 2005; "Land and Social Justice," Beijing, October 21-22, 2005; "Philosophy and Management," Beijing, October 22-23, 2005; "China's Modernization," Claremont, California, December 16-18, 2006; "Postmodern and Enlightenment," Beijing, April 7-8, 2007; "Law, Morality, and Politics from a Constructive Postmodern Perspective," Beijing, July 8-9; "Social Responsibility in Business and Harmonious Society," Tianjin, July 14-15; "Science & Technology Ethics and Business Ethics," Dalian, July 16-18; "Process Thinking and Curriculum Reform," Yantai, Shandong, July 19-20; "Philosophy: its Basic theory and problems," Jilin, July 25-29; "Constructive postmodernism, Marxism and Ecological Civilization," Claremont, October 26-28, 2007.

[36] "Polish Studies of Whitehead's Philosophy," 2003; "Process Philosophy in the Past and Today," 2004; "The Dynamism and Order of the Real World," 2005; "On the Nature of Human Time" (co-organized with the Whitehead Psychology Nexus), 2005; "Problems Concerning Process Categories," 2006; "Problem of God from Process Perspective," 2007.

[37] See Mgr Tshishiku [Tharcisse] Tshibangu, *Théologie positive et théologie spéculative, position traditionnelle et nouvelle problématique*, Louvain, Publications universitaires, 1965; *La théologie comme science au XXe siècle*. Préface par Marie-Dominique Chenu. Postface par J. Ladrière, Kinshasa, Presses Universitaires du Zaire, 1980.

[38] Joseph N. Mabika, "La résurrection de la métaphysique en Afrique noire," in Dimandja Eluy'a Kondo et Mbonyinkebe Sebahire (éditeurs), *Théologie et cultures. Mélanges offerts à Mgr Alfred Vanneste*, Louvain-la-Neuve, Nouvelles Rationalités Africaines, 1988, pp. 401-427.

[39] Alphonse Ngindu Mushete, *Les thèmes majeurs de la théologie africaine*, Paris, Éditions L'Harmattan, 1989.

[40] B. Bourgine, D. Ongombe et M. Weber (éditeurs), *Regards croisés sur Alfred North Whitehead. Religions, sciences, politiques*, Frankfurt, Ontos Verlag, 2007.

[41] Jay McDaniel and Donna Bowman (eds.), *Handbook Process Theology*, St. Louis, Missouri, Chalice Press, 2006; Mark Dibben and Thomas Kelly (eds.), *Applied Process Thought I: Initial Explorations in Theory and Research*, Frankfurt / Lancaster, Ontos Verlag, 2008. *Cf.* Michael Hampe und Helmut Maaßen (hrsg. von), *Materialen zur Whiteheads Prozess und Realität*. Band I, *Prozeß, Gefühl und Raum-Zeit*; Band II, *Die Gifford Lectures und ihre Deutung*, Frankfurt am Main, Suhrkamp Verlag, 1991.

[42] See "extensity and intensity" (*PNK* 69).

[43] Elizabeth M. Kraus, *The Metaphysics of Experience: A Companion to Whitehead's Process and Reality*, New York, Fordham University Press, 1979; Jorge Luis Nobo, *Whitehead's Metaphysics of Extension and Solidarity*, Albany, New York, State University of New York Press, 1986; Judith A. Jones, *Intensity. An Essay in Whiteheadian Ontology*, Nashville, Vanderbilt University Press, 1998.

[44] George W. Shields, *Process and Analysis. Whitehead, Hartshorne, and the Analytic Tradition*, New York, State University of New York Press, 2002; Johanna Seibt, *Process Theories: Crossdisciplinary Studies in Dynamic Categories*, Dordrecht, Kluwer, 2003; Michel Weber (ed.), *After Whitehead: Rescher on Process Metaphysics*, Frankfurt / Lancaster, Ontos Verlag, Process Thought I, 2004.

[45] Alfred North Whitehead, *Science and the Modern World*. The Lowell Lectures, 1925, New York, The MacMillan Company, 1925; Cambridge, Cambridge University Press, 1926. Reprint: New York, The Free Press, 1967, p. 48.

[46] Besides the specific studies that can be found in the well-known Woodbridge (*A. N. Whitehead. A Primary-Secondary Bibliography*. Jay MacDaniel and Marjorie Suchocki, Associate Editors, Bowling Green, Ohio, Philosophy Documentation Center. Bowling Green State University, 1977) and in its CPS update (http://www.ctr4process.org), a few historico-speculative works can be recommended to compensate for some of the missing entries: Antonio Banfi, *Galileo Galilei* [1930], published posthumously in 1949 and reprinted in 1961 (Milano, Ambrosiana, 1949; Il Saggiatore, 1961); François Beets, Michel Dupuis et Michel Weber (éditeurs), *Alfred North Whitehead. De l'algèbre universelle à la théologie naturelle*, Frankfurt/Paris, ontos verlag, 2004; François Beets, Michel Dupuis et Michel Weber (éditeurs), *La science et le monde moderne d'Alfred North Whitehead—Alfred North Whitehead's Science and the Modern World*, Frankfurt/Paris, ontos verlag, 2006; Milič Čapek, *New Aspects of Time. Its Continuity and Novelties. Selected Papers in the Philosophy of Science*, Dordrecht, Kluwer Academic Publishers, 1991; Philippe Devaux, *De Thalès à Bergson. Introduction historique à la Philosophie européenne*. [1949] Réédition augmentée et ill., Liège, Sciences et Lettres, 1955; Philippe Devaux, *La cosmologie de Whitehead. Tome I, L'Épistémologie whiteheadienne*, Louvain-la-Neuve, Les Éditions Chromatika, 2007; Reto Luzius Fetz, *Whitehead. Prozeßdenken und Substanzmetaphysik*, Freiburg und München, Verlag Karl Alber, 1981; Ferdinand Gonseth, *Les fondements des mathématiques. De la géométrie d'Euclide à la relativité générale et à l'intuitionisme*. Préface de M. Jacques Hadamard, Paris, Librairie scientifique Albert Blanchard, 1926; Gary L. Herstein, *Whitehead and the Measurement Problem of Cosmology*, Frankfurt / Lancaster, ontos verlag, Process Thought V, 2006; Michael Hampe und Helmut Maaßen (hrsg. von), *Materialen zur Whiteheads Prozess und Realität., op. cit.*; Helmut Holzhey, Alois Rust, Reiner Wiehl (Herausgegeben von), *Natur, Subjektivität, Gott. Zur Prozessphilosophie Alfred N. Whiteheads*, Frankfurt am Main, Suhrkamp Verlag, 1990; Ivor Leclerc, *The Nature of Physical Existence*, London & New York, George Allen and Unwin Ltd. & Humanities Press Inc., 1972; George Ramsdell Lucas, Jr., *The Rehabilitation of Whitehead. An Analytic and Historical Assesment of Process Philosophy*, Albany, New York, State University of New York Press, 1989. Ernst Mach, *Die Mechanik in ihrer Entwicklung Historish-Kritisch Dargestellt*,

Leipzig, Brockhaus, 1883 (*The Science of Mechanics. A Critical and Historical Account of Its Development*. Translated by Thomas J. McCormack; New Introduction by Karl Menger. Sixth edition, With revisions through the ninth German Edition, La Salle, Illinois, The Open Court Publishing Company, 1960); Robert John Russell (ed.), *Fifty Years In Science and Religion. Ian G. Barbour and His Legacy*, Aldershot, Hampshire, Ashgate, 2004; Jean Wahl, *Le Rôle de l'Idée de l'Instant dans la Philosophie de Descartes*, Paris, Alcan, 1920; Jean Wahl, *Traité de métaphysique. I. Le Devenir. Genèse des permanences. Les essences qualitatives. Vers l'Homme. II. Les Mondes ouverts à l'Homme. Immanence et Transcendance. Cours professés en Sorbonne*, Paris, Éditions Payot, 1953; Michel Weber and Pierfrancesco Basile (eds.), *Subjectivity, Process, and Rationality*, Frankfurt / Lancaster, ontos verlag, 2006; Ernest Wolf-Gazo (Herausgegeben von), *Whitehead. Einführung in seine Kosmologie*, Freiburg und München, Verlag Karl Alber, 1980.

Handbook of Whiteheadian Process Thought

Thematic Entries I

II. Aesthetics

Cosmological and Civilized Harmonies

George Allan[i]

1. Overview

Modern understandings of aesthetics usually identify it as one of the two branches of axiology (value theory), the other being ethics. Aesthetic values have to do with beauty; ethical values with goodness. The aesthetic worth of an object or experience is intrinsic to it rather than instrumental, something that makes it valuable for its own sake. An aesthetic object or event can be natural—a delicate rose petal, a beautiful sunset, a graceful gesture—or it can be artificial, something created by a human being for the purpose of evoking an aesthetic response—a Michelangelo sculpture, a Turner landscape, a *pas-de-deux* from the *Nutcracker*. Art is the field of human endeavor dedicated to the creation of aesthetic objects.

Traditionally, aesthetics is the last section of a metaphysical system that begins with foundational principles, moves through logic, cosmology, and physical science, then on to psychology, sociology, and history, before concluding with religion, ethics, and aesthetics. The Platonic influence is obvious. Metaphysics begins with the most real things—those that are universal, abstract, and timeless—and ends with those things that are least real—that are concrete, contingent, and fleeting. It starts with what can be known only by reason and concludes with what is known by the senses, by what is felt rather than thought.

Whitehead inverts this hierarchy. Momentary concrete achievements—actual occasions—are the most real features of the cosmos and all else is derivative. The first principles of metaphysics and the fundamental laws of nature are abstractive generalizations, interpretive hypotheses about the recurrent patterns that characterize the becoming and perishing of actual occasions and enduring objects. Aesthetics is foundational for Whitehead because the character of an actual occasion, its reality as a process of determinate realization, is aesthetic. The foundation of the world lies in activities of making that have inherent value. To be is to be beautiful.

Whitehead wrote extensively about aesthetics in a metaphysical sense, and he cites the arts as one of the specific forms of endeavor from which a metaphysical theory might take its departure. His comments about art and aesthetics as human activities, however, about the

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artist's crafting of aesthetic objects that evoke aesthetic experiences, are informal, illustrative, and episodic. Whitehead wrote no book on aesthetics, not even a collection of articles. The one exception is the fourth Part of *Adventures of Ideas.*

The remainder of this entry is organized as follows. I have attempted in Section 2 to pull together Whitehead's scattered ideas in a systematic way, beginning with his notion of aesthetic harmony as it applies specifically to works of art, expanding this notion to an exploration of the distinction between aesthetic and logical harmony, then expanding it further to a consideration of the cosmological foundation for the aesthetic. The implications of this understanding of aesthetics for epistemology and education are then explored. I conclude by discussing Whitehead's culminating vision of the aesthetic: his sustained account of how civilized existence depends on an effective expression of the interrelated virtues of Truth, Beauty, Adventure, Art, and Peace. Thus the movement of Section 2 follows the "airplane" trajectory that Whitehead says any metaphysical theory must take: from concrete experience to abstract systems and then back to concrete applications. Section 3 offers a sketch of the ways in which Whitehead's aesthetic theory has been interpreted by his commentators, and how it has been used to interpret the character of works of art and the artistic act of creation. In Section 4, I offer a few evaluative comments on what I find to be the most profitable direction in which philosophers have taken Whitehead's aesthetic ideas. Section 5 contains suggestions for further reading.

2. Whitehead's Aesthetics

2.1. Art and the Principles of Harmony

Whitehead defines art as "any selection by which the concrete facts are so arranged as to elicit attention to particular values which are realisable by them" (*SMW* 200). The vividness of the value is key, not the content. The dramatic sweep of a thunderstorm or a epic poem, the delicate subtlety of a butterfly wing or a sonnet, the well-ordered efficiency of a factory or a political campaign, are all works of art because they have a complex unity that captures our attention. We appreciate them not primarily for their usefulness but for the vivid reality they make manifest.

The intrinsic value of an art object is a function of the "strength" of the harmony it exhibits. The stronger the harmony, the more vivid the value. Whitehead identifies two dimensions of strength—"massiveness" and "intensity" (*AI* 253). Massiveness has to do with the number of elements included in the harmony, intensity with how coherently they have been integrated. Integration is the more readily achieved the more the cohering elements are similar, which can be accomplished by "narrowness" in what is included or by "vagueness" concerning their specific character. Integration is easier when the requirements for inclusion are minimal, a disorderly "width" or one that suffers from "triviality" (*PR* 111-12). Both the massiveness and intensity are increased when "contrasts" (*PR* 128) are utilized. The elements of a harmony are more effectively unified by contrasting rather than blurring their differences, when relationships are constructed in which conflicting details express rather than deny more general harmonies.

Thus there are degrees of aesthetic value, for although all art objects have achieved equally determinate results, they differ with respect to the strength of that achievement—the massiveness of its complexity and the intensity of its integration. Whitehead offers the Cathedral at Chartres as his paradigm. The details of its architecture, such as the nearly four thousand statues along its facades, all with their own "vigorous characters," are tightly integrated into the unity of the cathedral as a whole. The whole exhibits not merely an abstract "pattern of qualitative beauty" but "a beautiful system of objects," its components rendered systemically compatible without loss of their contrasting differences (*AI* 264). "Strength of experience, in massiveness and in intensity, depends upon the substratum of detail being composed of significant individuals" (*AI* 263).

A work of art can achieve considerable value, however, at a far remove from this paradigm, flirting with the extremes of maximal inclusiveness with minimal intensity or minimal inclusiveness with maximal intensity. A Brancusi bird daringly eliminates detail and difference in order to intensify unity, as does a Schubert lieder or a Japanese haiku. Obversely, in a Míro painting disparate elements brashly destabilize but do not destroy the integrity of the whole. This same journey to the edge of chaos characterizes a Mahler symphony or a sprawling picaresque novel such as *Don Quixote*. Aesthetic excellence, however, usually lies around a Chartres-like golden mean: as much massiveness as possible combined with as much intensity as possible. There is no formula, however, for achieving such optima of value. Creating great art is an art.

2.2. More General Kinds of Harmony

Whitehead distinguishes two kinds of harmony: harmonies are not only aesthetic but also logical. A logical harmony begins with diverse primitive elements and then synthesizes them into a harmonic whole, whereas an aesthetic harmony begins with the harmonic whole and then discloses its constituent elements. Logical creation moves from the many to the one. Aesthetic creation moves from the one to the many, "from the delight in the whole to appreciation of the details" (*MT* 61). Logical harmonies are constructions, the fruit of organizing separate individual entities into a system. Scientists are concerned with logical harmony, with quantitative systems in which the elements are integrated by means of mathematical relationships. The laws of physics and of axiomatized logics such Whitehead and Russell's *Principia Mathematica* exemplify this kind of harmony.

Aesthetic harmonies are qualitative rather than quantitative. The importance of this difference is suggested by what Whitehead calls the "haunting charm" of early medieval art. As with any art object, we are attracted to these works by their intrinsic quality, but they also manage to convey a sense of a reality stretching far beyond what is directly perceived. Our direct aesthetic experience suggests that there is more than this experience can encompass, connections that, however dim and fragmentary they might be, "sound the utmost depths of reality." The medieval faith in an order of nature, which the opening chapter of *Science and the Modern World* shows to have been crucial to the emergence of modern science, finds expression in its art. It is a faith that particular things are part of a greater whole, that "in being ourselves we are more than ourselves" (*SMW* 18).

Aesthetic artistry involves developing a new perspective on familiar things, a novel way of organizing them so as to bring into the foreground what has previously been lurking in the background—to transcend the obvious. Because there is always a periphery beyond every focus, depths not fathomed by any formulation of what is the case, artistic genius involves reaching into these depths in order to devise a novel synthesis that carries us out a bit further than before into the unknown. Thus Whitehead closes *Modes of Thought* by likening philosophy to poetry. The one uses mathematical pattern, the other meter, but both refer to "form beyond the direct meaning of words" (*MT* 174). Philosophy seeks to rationalize mysticism, to offer in precise linguistic and mathematical symbols a rational interpretation of the depths that necessarily escape our finite understanding. Art (including poetry) discloses those depths non-linguistically, evoking our vaguely felt sense of the ways the here and now relates to an environing more. Even when words are the medium of artistic expression, the aesthetic experience carries us beyond the dictionary meanings of the words. Our enjoyment of Hamlet's "to be or not to be" soliloquy is not found in his apparent exploration of a series of logical dichotomies (*PR* 185).

Among the arts, the kinaesthetic ones are the most ancient because, says Whitehead, their symbols are easier to produce than pots, pictures, or poetry (*RM* 20-23). Ritual emerges as a way for humans to relive in tranquility what was initially experienced as a struggle for survival. Gathered in the security of their cave around a fire, cooking the meat from an animal killed earlier in that day's hunt, someone reenacts in bodily movements and facial gestures the cleverness of the search, the caution of the stalking, the danger of the kill, the fatigue of the return, the delight in the meal. The emotions of the hunt are in the foreground; rekindling them is the point of the reenactment. Eventually, verbal symbols are added, permitting both greater economy and greater subtlety in the emotions invoked. Odysseus, dwelling among the shades in Hades, listening to Homer chant his heroic exploits, is able to enjoy them free from the perils that were so salient when they occurred (*AI* 272).

Thus art satisfies "this simple craving to enjoy freely the vividness of life which first arises in moments of necessity" (*AI* 272). But it also makes judgment possible. The heroes become role models for their successors, their courage and craftiness generalized as normative measures for assessing the value of a person or an undertaking. Self-consciousness emerges as ritual and mythic speech makes it possible to step back from immediate practical concerns, to compare present conditions and future opportunities with a remembered past, to imagine a creatively embellished ideal located in that past and to be judged and guided by it. "The souls of men are the gift of language to mankind" (*MT* 41).

2.3. Cosmological Harmonies

The Function of Reason maps the contrast between logical and aesthetic harmony onto the cosmos. It does so by explicating "two main tendencies in the course of events": an entropic element involving a steady degradation in the quality of achievement and an originative element involving improvement in quality. Unless disciplined by Reason, however, the originative element is a fast track to degradation, introducing more novelty than can be effectively integrated by established techniques, forcing a retreat to some lesser quality in achieved harmony. Speculative Reason, the reason of Plato, emphasizes massiveness by increasing the

scope of what is relevant and then fashioning new schemes for their integration. Practical Reason, the reason of Ulysses, emphasizes the intensity of the scheme's integration by insisting that its scope be kept within manageable limits. Either mode of reasoning by itself merely echoes one of the two cosmic tendencies that need disciplining. Together, however, they "embody in us the disciplined counter-agency which saves the world" (*FR* 34).

Whitehead calls this interweaving of both the speculative and the practical "The Greek Discovery." His discussion of it is completely in terms of science, the fashioning of "logical harmonies," the imaginative elaboration of empirically testable schemes of thought. Aesthetic harmonies are equally important interweavings, however, in their way also a counter-agency to cultural and cosmic decay. Artistic creations expand the scope of relevance not by schematizing closed systems but by adumbrating the open-ended totality that encompasses but always escapes systemic formulation. Art discloses the "solemnity of the world," the world as always stretching indefinitely beyond all finite facts and the finite systems integrating them. Aesthetic experience, as it leads us toward greater depths of feeling, becomes religious experience, an "intuition of holiness" (*MT* 120).

If logical harmony invokes a sense of the "iron necessity" of law, aesthetic harmony invokes "a living ideal moulding the general flux in its broken progress toward finer, subtler issues" (*SMW* 18). The cosmos needs both the power to achieve stable order and the power to transform it into some better order. It is a realm of adjusted values mutually intensifying and destroying what has been achieved, a dynamic interplay of established law and rebellious innovation.

It follows from these considerations that harmony needs to be a fundamental feature of the categoreal scheme that sets the metaphysical parameters of Whitehead's cosmology (*PR* Chapter 2). The details of the categoreal scheme and its metaphysical implications are discussed elsewhere in this Handbook. We need only underscore the aesthetic character of the reality for which the metaphysics proposes an interpretation. Concrescence, says Whitehead, is "aesthetic synthesis" (*PR* 212). It begins with the nascent occasion's physical prehensions of the given world, prehensions that are as richly varied as the world. The challenge is for the concrescence to make from this multitude of prehensions a new well-ordered distinctive unity, to reconcile a many, to synthesize a one.

The Categoreal Obligations explain how such a synthesis is possible (*PR* 26-28, 247-55). The first, the Category of Subjective Unity, stipulates the logical condition for harmony: that the diverse, as-yet unintegrated prehensions belonging to incomplete phases of the process of concrescence are nonetheless "compatible for integration by reason of the unity of their subject" (*PR* 26). The fourth and fifth categories, Conceptual Valuation and Conceptual Reversion, are concerned with the origination of the novel possibilities needed to effect the concrete harmony promised by the logical condition set forth in the first category. The sixth and seventh categories, Transmutation and Subjective Harmony, stipulate the conditions governing how that promise can be realized, how incompatibilities can be modulated into contrasts and an actual harmony produced.

When Whitehead elaborates on the categoreal obligations later on in *Process and Reality*, he refers at one point to the seventh category as the Category of Aesthetic (rather than Subjective) Harmony, and rightly so, for it has to do with "aesthetic adaptation" (*PR* 255). Precisely

because the concrescence of an actual occasion is constrained initially by the condition that its prehensions have a logically harmonious content, and because it is guided in its determinative trajectory by conditions that make for aesthetic harmony, the process issues is a definite result, one that departs from its inheritance sufficiently enough to effect that result. Whitehead says these categories create a "pre-established harmony" (*PR* 255). What is pre-established, however, is not the specific outcome but the conditions guaranteeing that there will be an outcome of some sort, and that it will be a fully integrated whole, a unique new actual occasion, come to be in addition to the many from which it emerged. Each actual occasion is, in this sense, a work of art.

2.4. Practical Harmonies

Whitehead's epistemology, developed in *Symbolism* and in *Process and Reality*, echoes the structure of concrescence. The world is first experienced in the mode of causal efficacy as a circumambient vague presence demanding to be taken account of. These feelings of influence from beyond oneself are transformed into the sensa that characterize experience in the mode of presentational immediacy. By means of symbolic reference, these sensa are projected onto the spatio-temporal region from which the feelings were felt to originate. This interpretation of the causally efficacious then guides the perceiver's actions, and guides them fruitfully insofar as the sensa focus attention on aspects of the world relevant to the perceiver's purposes, to matters of survival and betterment.

The "immense aesthetic importance" we give to sensa is because they are derived from these vague feelings of influence (*AI* 245). The affective tone of our experience in the mode of causal efficacy is reproduced in the subjective form of their transformation into sense data. Secondary qualities are transmutations of how we feel the impinging world; the adjectives of our languages derive from the adverbs. Whitehead's example is of the "strong aesthetic emotion" associated with colors: we see the red cloth angrily, the green fields serenely (*AI* 246, 250).

The abstracting of sensa from their affective origins is an invaluably practical ability. By means of it, we develop clear precise information about the world, which we then use to guide our actions. The practical utility of presentational immediacy can tempt us to forget its dependence on causal efficacy. We ignore or even denigrate the vague unquantifiable feelings upon which our sense data depend, identifying feelings as features of our subjective responses rather than as objective features of the external world, as irrational rather than rational. The fallacies Whitehead famously identifies—"misplaced concreteness" (*SMW* 51) and "the perfect dictionary" (*MT* 173)—result from neglecting the dependence of sensationalist and rationalist forms of knowledge on aesthetic experience.

A similar mistake plagues education. In the second and third chapters of *The Aims of Education*, Whitehead argues that there is a rhythm to the learning process, one that cycles through three stages: romance, precision, and generalization. He chastises educators for beginning—and ending—with precision, prizing only what is clear and distinct, what is capable of being organized systematically. Before students can be expected to find the discipline of careful analysis worthwhile, they need to have an opportunity to exercise their imagination and curiosity, to follow out "unexplored connexions with possibilities half-disclosed by glimpses

and half-concealed by the wealth of material" (*AE* 17). This stage of romance is an aesthetic stage, because it emphasizes direct experience and interconnection. We must begin with what is concrete and therefore open-ended. Experiencing things for the first time—looking through a telescope, going to an opera, attending a town meeting—is vividly thrilling because these experiences are overflowing with import, their content as yet unbounded by the requirements of disciplined understanding. Students are better served reading Plato's dialogues, even in translation, than by reading a textbook in which someone systematically explicates at second-hand what Plato said or meant (*AE* 74).

Romance should lead naturally to precision as students, wanting to know more about what they find important, willingly acquire the methodological tools of analytic inquiry and learn to relate their growing knowledge to established theories and other bodies of fact. Star-gazing motivates a student to study astronomy; opera going, to take voice lessons or enroll in a music course; experiencing local politics, to stand for political office; reading *Meno* in English, to become competent in classical Greek. Generalization, Whitehead's third stage of education, returns students from the abstractions of the disciplinary competence they have achieved to the immediacy of the romantic. Now they come equipped, however, with the tools of their disciplines. The innovative thinker, the creative artist, and the effective leader are all able to transcend established routines—pushing beyond normal science, acceptable styles, and practical good sense. They can do so because they have not only mastered the established techniques but are aware of the limitations of those techniques, aware of the unrealized alternatives and unexplored possibilities they necessarily exclude.

Education, Whitehead argues, is "the guidance of the individual towards a comprehension of the art of life," by which he means "the most complete achievement of varied activities expressing the potentialities of that living creature in the face of its actual environment" (*AE* 39). It requires an "artistic sense": knowing how best to subordinate our lower to our higher possibilities. The practice of the art of life begins with wonder, curiosity, and reverence, progresses to the development of self-discipline, and finds its fruition in effecting through our own initiative an outcome better than what we had previously achieved. The habit of this way of responding to circumstances allows us to achieve in our lives "the sense of beauty, the aesthetic sense of realised perfection" that is our fulfillment as persons (*AE* 40). As with all great artistic creation, such an individual life always points beyond itself, to possibilities it has not realized, to values that transcend even as they inform its own finite accomplishments. The art of life is to make of one's life a work of art.

2.5. Civilized Harmonies

In the concluding five chapters of *Adventures of Ideas,* Whitehead offers his only sustained discussion of what are otherwise scattered comments on aesthetics and the arts. He defines "civilization" as the quality of any society that exhibits the characteristics epitomized in five notions—Truth, Beauty, Adventure, Art, and Peace.

Truth and Beauty are the two "regulative principles in virtue of which Appearance justifies itself to the immediate decision of the experient subject" (*AI* 241). That is, they are the factors by which the subjective form of a prehension is modified so as to emphasize or attenuate its

content, thereby prolonging or undermining some heritage of achieved value. Reality, experienced in the mode of causal efficacy, is transformed by the modality of presentational immediacy into an Appearance. Truth is the relation of that Appearance to the Reality it purports to represent. Art creates a truth relation in which the objective content of the Reality to which its symbols point is subordinated to the subjective form of that relation. The symbols bring the vague emotional tonalities of an experience into prominence. These tonalities provide "an emotional clothing which changes the dim objective reality into a clear Appearance matching the subjective form provided for its prehension." The "delicate inner truth of Art" is this power it has to express truths about the nature of things that elude discursive language (*AI* 249).

Whitehead distinguishes Beauty from the Beautiful. Beauty is the quality of a concretely exhibited harmony. Some of the elements available for incorporation into that harmony are Beautiful because of their potential to contribute positively to it, whether or not they actually do. They would enhance its Beauty were they included, "by a fortunate exercise" of the artist's creativity. Such elements are ideals, beautiful because of their "inherent capacity for the promotion of Beauty" (*AI* 255). The quality of being beautiful is a contextual feature, the resourcefulness of a physical or cultural heritage to encourage efforts that aspire to create higher harmonies and to provide opportunity for realizing those aspirations. A society's artists in particular, its cultivated elites more generally, all its citizens ideally, are agents of hope insofar as they fashion, preserve, and celebrate the beautiful potencies of their world.

The things that not only possess beauty but are also beautiful are always concrete particulars: this granddaughter smiling up at us, this vista we observe at the end of an arduous climb, this haunting melody played by the oboist in the symphony's second movement. They are beautiful, however, because the emotional intensities found in experiences of this sort have been remembered, generalized, and then focused on that specific individual or object. Our love for our family, for parents and children, for ancestors long dead and descendants not yet born, an emotion distilled from all our particular interactions with them and about them, is invested in the smiling grandchild. This child is distinctively herself, born of a particular mother on a particular day and in a particular place, already having a biography to recount and expectations to pursue. But through these particular features that constitute her Beauty, we see her as Beautiful also, as embodying a familial love that existed before she was born and that will endure long after she has grown old and died.

These generalized feelings adhere in what Whitehead calls an "*It*": an apparent enduring object with its permanent character, transcending the immediate moment and yet evoked by and through such moments. We prize a cenotaph carved under the watchful eyes of Sennacherib (*AI* 262) because its historical uniqueness, its having come into existence at that very particular time and place, evokes an emotional engagement with this powerful monarch, and through him with an ancient empire that once flourished, with a sense of glorious achievements won and lost, with an ontological sense of the hard truth that all things come to be and perish. The cenotaph is Beautiful because it frees us from our parochial concerns, prods us to imagine other times, other successes and failures, and so lures us to dream of what we might do to improve upon the Beauty in which yesterday's efforts found their resolution.

Thus great Art lures us from the Beauty of what the artist has made to a sense of the Beautiful that we too can make. It lures a civilization away from an idolatry of its distinctive value achievements toward the innovations necessary for its adaptive survival. Art is an engine of instability, and therefore it is the soul of a civilization. For "civilization is nothing other than the unremitting aim at the major perfections of harmony" that the achievements of the past have made possible (*AI* 271). Whitehead calls the pursuit of this "unremitting aim" Adventure because the end sought is always at risk. The pursuit is destabilizing, and so the new level of harmony is a possibility that might not be achieved, that might result in a lesser rather than a higher harmony. Even where there is local success in achieving higher and then yet higher harmonies, no final ultimate harmony is possible. There is an "intrinsic incompatibility" in things: incommensurable ideals struggling for realization, always and everywhere the violence of strength against strength (*AI* 279). What a great work of art exhibits, however, is an ideal of "the harmony of all perfections" (*AI* 276).

The last of the five qualities Whitehead says a society must possess to qualify as a civilization is Peace, which is our sense of the ideal harmony just mentioned. Peace involves no utopian vision, but is rather "a trust in the efficacy of Beauty" (*AI* 285), in its capacity to lure us beyond established boundaries, toward stronger higher harmonies. The fruit of Peace is the love of humankind as such, the "zest of self-forgetful transcendence" (*AI* 296), a "living urge toward all possibilities, claiming the goodness of their realization" (*AI* 295). The dream of actualizing such ideals is bound to fail, in whole or in part. The harvest is always tragic. The ideals remain, however; for our failure to actualize an ideal has its own beauty. Tragic Beauty is therefore Beautiful, for it has the power to revive hope, to encourage our effort to find new ways by which the failed ideal might be realized.

A sense of Peace is thus akin to a work of art. It means perceiving the cosmos as a complexly dynamic and enduring totality, composed of creative individuals succeeding or failing in diverse ways in their effort to achieve some sort of finite harmony, each individual redolent with the beauty of its achievements and beautiful in its aspirations, and the whole cosmos therefore beautiful. Peace is our sense of taking part in an adventure we share with all entities past, present, and future, with all things that have perished, that are concrescing, and that might someday be possible. As a work of art reveals a depth and scope of relevance far exceeding what it explicitly exhibits, so Peace reveals the Final Fact of an ideal unity, a Harmony of Harmonies, that is its own justification. Peace is thus the way the world is persuaded "towards such perfections as are possible for its diverse individual occasions" (*AI* 296).

3. Secondary Sources

The standard general commentaries on Whitehead's philosophy mention art or aesthetics only in passing, and then mainly to note, but not to explicate, his recurrent use of aesthetic terms. Bertram Morris, in his 1941 contribution to the Library of Living Philosophers volume on Whitehead, provides the first sustained exposition of Whitehead's aesthetic theory, which he does in terms of its centrality in the genetic analysis of actual occasions. Charles Hartshorne on

a number of occasions explicates the hierarchical character of aesthetic value in Whitehead's metaphysics. David Martin, in a 1955 essay on the "Unrealized Possibility […] immanent in the 'given' of works of art" (1955, 394), uses Whitehead's categoreal obligations to explicate the difference between merely *hearing* a Beethoven symphony and *listening* to it, experiencing the "infinity and transcendence" it reveals. Two years later, John Cobb, Jr. argues that the aesthetic is a feature of objects, not of one's subjective response to them. An object is aesthetic to the extent that it is "determinative of the subjective form" of its prehension in the mode of causal efficacy, and that prehensive experience is "aesthetically satisfactory" (1957, 179). The work of art is beautiful and so it causes the viewer's experience of its beauty.

Donald Sherburne rejects Cobb's definition of the aesthetic. In the first book-length development of an aesthetic theory based on Whitehead's thought, Sherburne argues that a work of art is a proposition rather than an object. An art object, such as a painting in a museum exhibit, is an "objectification" of an aesthetic proposition. Aesthetic experience is "aesthetic recreation": our emotional response to the painting includes the subjective aim of recreating in our own immediate experience the proposition objectified in that painting. Any experienced object has some modicum of propositional lure, but an art object exerts "commanding control over an overpowering percentage of subjective aims that encounter it" (114). The creativity that effects this commanding control involves fashioning what Sherburne calls a "horizontally transmuted intellectual feeling" (165).

Subsequent essays on Whitehead's aesthetics split into two camps: those that agree with Sherburne's "rationalistic aesthetic" with its emphasis on the propositional character of art and those that advocate an "empiricist aesthetic" in which art is said to involve an "immediate, physical, emotional, and nonconscious response to the world" (Dean 1983, 107).

Stephen David Ross belongs to the rationalistic camp, weaving a theory of the inexhaustibility of art out of Justus Buchler's ordinal metaphysics and Whitehead's theory of contrasts. Robert Valenza extends Sherburne's thesis in an essay that demonstrates through well-chosen examples how with respect to "an experiential flow from the outside world […] science condenses this experience, thus sharply defining truth, [whereas] art expands it" (2002, 72). Unlike a scientific proposition, an aesthetic proposition "distances" us from "ordinary reality" through not only horizontal transmutation but also what he calls "dissociative reversion." William Dean, in an essay on Whitehead's "other" aesthetic, rejects this over-intellectualization of art, arguing that an aesthetic experience is nonpropositional: an "intimate concourse of the body with the aesthetic worth of the world" (1983, 108). Similarly, David Martin's book on sculpture explains how "perceiving bodily" creates an "enlivened space" around the physical sculpture; the art object is propositional, but it is felt, not thought.

David Hall (1973) wrote the only book that deals with art in the context of Whitehead's theory of culture as found in *Adventures of Ideas*, and so his book provides a thorough account of the role of human society in the nurture of aesthetic appreciation and artistic creativity. Hall interprets Whitehead as distinguishing art, understood as one of the five "aims" that define civilized societies, from art understood as a cultural "interest." Truth, beauty, art, adventure, and peace are ideals, but they "can be made a part of a social order only if the theoretical and practical energies are directed toward their realization" (1973, 110). Art—along with morality,

religion, science, and philosophy—are the cultural interests in the West that have predominately served this role. Hall laments the decline of our cultural ideals and imagines the emergence of a "new sensibility" based on a Whiteheadian understanding of finitude that "prevents cynicism and overcomes despair," a "new religious vision" it is the function of art to proclaim (1973, 195).

Hall agrees with the empiricist approach to aesthetics, criticizing Sherburne for paying insufficient attention to the physical—realist—aspects of art. A genuine "naturalism" needs not only to appreciate the inventive "artificiality" of aesthetic creation, the strategies of transmutation that result in intensities of experience not otherwise available, but also to appreciate how art is rooted in the concretely practical everyday necessities of life, in circumstances having to do with individual and group survival and well-being (92-94). No writer has taken this sense of aesthetic naturalism more seriously than Susanne Langer. Her distinction in *Philosophy in a New Key* between "presentational" and "discursive" symbols is a superbly inventive application of Whitehead's distinction between causal efficacy and presentational immediacy. Her account of the shift over time away from presentational symbols toward the dominance of discursive symbols elaborates Whitehead's comments, primarily in the first chapter of *Religion in the Making*, on the emergence of rational thought from religious ritual and myth.

Leonard Wessell's book on the function of aesthetics in Whitehead's cosmology seeks to use the aesthetic as the key to an interpretation of the philosophy of organism. A number of essays use Whitehead's aesthetic theory to interpret the work of a particular artist, usually a poet. His theory has also been applied to areas other than the arts, mainly by emphasizing the nonlinear inter-relational character of his notion of aesthetic harmony. For instance, William Dean, in his book *Coming To,* affirms aesthetic categories as theologically more fundamental than those having to do with goodness or truth. Barry Whitney offers an aesthetic alternative to traditional forms of theodicy. Robert Mesle develops a theory of personhood based on an ideal of aesthetically grounded "relational power." Pete Gunter proposes an "aesthetic of nature" focused on forests, in which beauty and ecological diversity are linked, in which the destruction of wilderness and the development of monocultures "wrong the aesthetic *telos* of nature itself" (2004, 322). The neurologist Jason Brown uses Whitehead's epistemology to develop a "microgenetic" theory of mental processes rooted in "aesthetic perception." Steve Odin uses Whitehead extensively in developing a "comparative aesthetics" approach to Japanese and Western art.

4. Concluding Remarks

Whiteheadian commentators offer no explanation for why Whitehead never developed an explicit aesthetic theory. Equally perplexing is why none of the commentators have remedied this neglect on Whitehead's part. Sherburne is the exception, but his book is essentially a Ph.D. thesis. Although he subsequently wrote a number of essays on Whitehead's aesthetics, he never followed up with a further book-length study. David Martin's books are the best example of

sustained examinations of actual works of art using Whitehead to help frame one's interpretive categories. The total number of essays on Whitehead's aesthetic theory, and those that use his theory in discussing aesthetic topics are relatively small, and except for some that relate to Sherburne's propositional interpretation, in support or critique, these essays are lonely ventures, disconnected from one another. Whiteheadian aesthetic scholarship, ironically, lacks massiveness, and what diversity there is has not been transmuted into contrasts leading to strong harmonic satisfactions.

This weakness is partially offset, however, by philosophers whose metaphysical creations have been inspired at least in part by Whitehead's aesthetic theory. Whitehead's contemporary, John Dewey, and his student, Susanne Langer, are the best known English-language exemplars of this sort of metaphysical adventuring. The influences of Whitehead's aesthetics in German philosophy can be found in the writings of Nicholaï Hartmann and of Reiner Wiehl.

Two current metaphysicians deserve special mention—Robert Neville and Frederick Ferré. Neville develops an axiological ontology in which each and every entity is a harmony of "conditional features" marking its dependence on other entities and the "essential features" by which those conditional features are integrated, constituting the entity's absolute uniqueness. Every harmony is also a conditional or essential feature for other harmonies, and how these harmonies are harmonized temporally in the durations of entities, especially of "discursive individuals," generates an ethic based on "normative measures" of self-fulfillment and self-transcendence. Ferré argues that the basic factual entities of the universe are self-fashioning processes involving the integration of diverse elements into a definite unity, a harmony. To achieve any sort of harmony is to generate beauty, so a cosmos composed of beauty-fashioning entities is "inherently kalogenic." Given such a universe, an ethic obviously follows in which not only persons but other organisms, indeed entities of every sort, should be treasured for the value achieved in their existing and for their relevance to possibilities for future value realization.

These creative re-formations of Whitehead's ideas are fitting homages, more so than the secondary scholarship. Lured by the ideal of the aesthetically grounded metaphysics that Whitehead's work reveals even in its failure to actualize it, these "post-Whiteheadian" metaphysicians express the "Unity of Adventure" which Whitehead says is the height of civilized existence.

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III. Anthropology

Communities and Destinies

Donna Bowman[i]

Anthropology is a key discipline in any philosophical or theological system. Some approaches, such as those of Kant or Descartes, necessarily begin with the human being, because experience as produced and/or filtered by human consciousness must be the starting point for all reflection. Other approaches, like those of Aquinas or Barth, attempt to begin with divinity, discovering the nature of the human being through a combination of revealed truth from above and the activity of reason from below. Still others, such as existentialism or postmodernism, reject systematic metaphysics as a goal, and attempt a dialectical phenomenology to describe, but not delineate, human existence in the world.

Whitehead's metaphysical goal was undeniably systematic and began "from below," thus placing him in the first camp. Yet while Whitehead accepts that our discovery of reality begins with "the order of dawning," that is, with the appearance of experience in consciousness, he rejects the notion that this is where metaphysics itself must begin (*PR* 162). Instead, he follows a more classical approach, asking questions with a much larger scope than the anthropological, and attempting to create a system that encompasses anthropology as a particular case (whether special or ordinary, it is yet to be seen). The question of the human being, then, appears in Whitehead's philosophy as the beginning of the empirical method, but only as a subheading of the system in general. And in fact, in the systematic (as opposed to the methodological and historical) chapters of *Process and Reality*, the human being appears as a quite remote subcategory, being overshadowed by the more general topics of societies and nexūs, and the more crucial specialized case of the divine entity. In his less systematic works, such as *Science and the Modern World*, *Adventures of Ideas*, and *Modes of Thought*, human society, history, and mind are always to the forefront, as Whitehead adopts the Enlightenment approach to metaphysics through systematic (human) *thought*.

The nature and destiny of man, as Reinhold Niebuhr once put it in a book title, are among the most urgent preoccupations of philosophy. Indeed, one might argue that the bulk of the philosophical enterprise has as its precipitating aim the need to know the human self. Even as philosophers explored the nature of reality as such and investigated the preconditions for such knowledge, the question of human nature and purpose remains central, as the motivation for the larger investigation and, for many, as its ultimate goal. If such a complex investigation is

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needed to discover the nature and significance of human existence, it would not be surprising if the answer turned out to be far from simple.

And so it is, according to Whitehead. Because process thought posits a kind of atomism of experience that exhibits emergent properties when structured into higher-order organisms, human beings fall closer to the far end of a continuum that extends from very simple realities to complex ones like consciousness. There is a real possibility of further evolutionary development along these lines, as well as the existence of even more complex or advanced creatures in other parts of the universe currently inaccessible to us. Their future or contemporaneous existence may even be assumed—an assumption consistent with Whitehead's metaphysical turn away from anthropocentrism. In order to address the topic of anthropology, then, we shall need to work both downward and upward from the human being, considering the components of which a human being is constituted, as well as the possibilities for evolution or alternate forms that illuminate her particularity.

1. The Lessons of Direct Experience

Like all reality, human beings consist of actual occasions—droplets of existence that come into being out of their pasts and perish upon achieving "satisfaction," or the completion of their becoming. Process philosophy often focuses on analyzing these individual, momentary entities. But it quickly becomes obvious that the task of understanding the realities which most concern us at the human level (i.e. between the sub-microscopic scale of actual entities and the macroscopic scale of the entire universe or multiverse) is not limited to such an analysis. Human beings, along with other living and non-living enduring objects, exhibit properties and capacities that cannot be accounted for by reference to the properties and capacities of actual occasions. (For a definition of "enduring object," see *PR* 34.) However, comprehension of the "life cycle" of an actual entity does lead to several conclusions that are important to a process-based anthropology.

(1) *We are made out of our pasts.* First, process anthropology gives metaphysical weight to the humanistic and even relativistic discoveries of modernism (the historical consciousness) and post-modernism (the absence of any neutral territory from which to observe). What a human being is, as well as who he is, depends on the context in which he arises. Since all contexts are unique spatiotemporal and social locations, and all historical routes leading to emerging entities are different, opportunities to generalize about human nature are extremely limited. The hallmark of humanity is variety, not similarity. This widely recognized fact is consistent with process thought's analysis of the temporal entity in terms of the data of its past.

(2) *We bear responsibility for what we become.* The inevitable consequence of an uncontrollable past is a solitary present. While none of us can choose our ancestors or birthplace (and this lack of choice continues for several years, until some measure of independence can be attained), each moment brings us a choice about how we will respond to the facts of our past. Whitehead speaks of the actual entity's "decision" to value its constituting data in a certain way. While the term "decision" must be used in a strictly technical sense about non-conscious

entities, it certainly can be used in its common-sense meaning with reference to human beings (although, using the term in a Whiteheadian way, only a minority of human "decisions" are conscious ones: *cf. PR* 28, 43-47). Naturally not every moment of becoming from infancy onward is an act of conscious decision, and the range of possibilities from which to choose, as well as the ability to weigh the nuances of the decision, increases with maturity. Nevertheless, the fact that we are constrained by the facticity of our past, yet free in the moment to decide how to arrange that facticity into a life, makes human beings both profoundly contextual and profoundly responsible for themselves.

(3) *We cannot hold on—we must let go.* The final lesson that can be derived from process of an actual occasion is that no part of us is permanent. Perpetual perishing is the way of all reality. As one occasion passes out of its "living" phase and into its "dead" phase, another arises. And the unchanging brute facts of the past are "resurrected" as data in a new occasion. Human beings have been concerned about death from time immemorial; some of the earliest artifacts of our species have been preserved because they were a part of burial rituals. Yet reality continually frustrates our attempts to stop time and preserve ourselves unchanged. We recognize that each moment is a slipping away of what matters to us, but we nevertheless murmur (like Goethe's Faust), "Verweile doch, du bist so schön." The perishing of the actual occasion means that we perish, too—and not just moment by moment, but also in a final relinquishing of our enduring life. We are creatures that arise, persist through change, and die—overlapping and being succeeded by others who will "immortalize" us by remembering and utilizing our facticity.

With these building blocks from the atomic level of experience in mind, let us examine how actual occasions organize themselves into living creatures, including human beings.

2. Humans as Communities

The relationship of the human being to her constituent actual occasions can be described by three Whiteheadian terms. The first, "multiplicity," is also the simplest; it refers to a collection of actual occasions considered only as the data that an emerging entity will unify. Since the human being does exhibit a more robust unity than this mere "collectedness" into a set of data—a unity that endures over time and provides an immediate, bounded "microverse" that strongly contextualizes all entities emerging in it—the description of the human being as a multiplicity is not as apt as the other terms about to be explicated. However, it is important not to let the multiple nature of the human being slip away entirely from our view. To mention only a few considerations, I am undoubtedly prehended as just this sort of collection—the set of actual entities that are collectively called "me"—by other human beings, gathered therefore as a multiplicity in their experience. Furthermore, the boundary between me (mind and body) and everything that is not me is far less defined than we tend to assume. We are constantly exchanging matter and energy with our surroundings: the body takes in and sheds molecules; we eat, process and excrete foodstuffs; we even retain a thin layer of atmosphere and gravity of our own as we move through the world. Our minds, too, are in such intimate interaction with the

environment through the medium of our senses (which themselves gather in matter and energy, be it molecules of scent or photons of light), that the question of where the mind begins and the environment ends, or whether the two are completely disconnected (since no simple point of intersection is apparent) continues to occupy philosophers, neuroscientists, and psychological specialists. Whatever may be the final answer to the puzzle of consciousness, the fact remains that it is impossible at any given moment to delineate the set consisting of all the parts of the human being, and only those parts. To that extent, then, it is crucial for the process anthropologist to remember that there is a multiplicity to the human being that resists reification and organic definition.

Moving closer to the human being as we directly experience it, we come upon the Whiteheadian concept of *nexus*. A nexus is "a public matter of fact," a "set of actual entities in the unity of the relatedness constituted by their prehensions of each other" (*PR* 22, 24). Unlike a multiplicity, whose only unity is found in the actual occasion that prehends all its members in terms of an ascribed quality or common feeling, a nexus is mutually interconnected prior to and outside of the prehensions of another. Its members prehend each other and thereby enter into the kind of internal relations that are the hallmarks of Whitehead's system.

Here we run headfirst into a difficulty that Whitehead scholars have long acknowledged: the problem of mutual contemporary prehensions. The data for each emerging actual occasion consists of the entities in its immediate past world. In order to be prehended, entities must be past—satisfied, dead, brute fact, no longer becoming, only being. How, then, are we to understand the concept of a nexus with its members prehending each other? A past entity prehends nothing; it is only prehended. A presently-unfolding entity, conversely, only prehends; it is not (yet) prehended. Whitehead insists, however, on speaking of mutual immanence among the members of a nexus, even though "[i]t is the definition of contemporary events that they happen in causal independence of each other" (*AI* 195). He is able to do so because the prehensions of each other that the members enjoy are not direct and contemporaneous, but mediated through the elements in their past that they prehend in common, as well as through the common future in which they will be objective elements: "Thus indirectly, *via* the immanence of the past and the immanence of the future [in the occasions' presents], the occasions are connected" (*AI* 195). It is also that case that a nexus is not merely a momentary, immediate-present connection between entities: it is one that extends through time. For that reason, the mutual relationship of which Whitehead writes takes on the dual form of aspiration and constraint. The constraint arises from the asymmetry of the relationship between a past occasion (which is immanent in a following occasion as an efficient cause) and a present occasion (which is immanent, much less restrictively, in the past occasion as an anticipated outcome of the past occasion's becoming) (*AI* 197). The aspiration of the relationship arises from the genesis of the nexus in a proposition, or "complex eternal object"—a potentiality for unity that is concretely embodied in this set of actualities aiming, to the extent that they both aim at the creation of a common reality.

Finally, human beings are most fully described by the Whiteheadian term "society." A society is "a nexus with social order," meaning that the members (a) share a common element of form, (b) prehend each other, and (c) reproduce the form in their own actualities as a result of

prehending it positively in each other (*PR* 34). This form (a complex eternal object, like the one out of which a nexus arises) propagates throughout the society through positive prehensions that result in a genetic relationship; it is "inherited throughout the nexus, each member deriving it from those other members of the nexus which are antecedent to its own concrescence" (*PR* 34). Human societies also exhibit personal order, meaning that their constituent entities inherit their common form serially—that the society's "defining characteristic" has a "single line of inheritance" (*PR* 34). Thus all members of the society participate in the identity of the society, although they are not all identical with each other.

It is all too easy when discussing the nature of the human being to read the language in use as referring to substances that endure over some period of time. To get into the process mode of thought, however, one must remember that in a so-called enduring object, what endures is the identity that unites the society, not any single member of the society, nor any group of its members. Whitehead underlines this point when he points out that "there is no one nexus which can claim to be the society, so long as that society is in existence" (*AI* 204). In other words, as long as the society is growing by adding members serially that inherit its common form genetically, no definitive group of the members of that society can be delineated. But once the enduring object has ceased to live (once the human being is dead, for example), then a nexus can be identified that is fully identical to the society, because no further members of that society are being added.

Such a description implies a definition of "life," "death," and "existence" that calls immediately to mind the philosophical point of view of existentialism. And indeed, the existentialists, especially as they have informed theology by way of Heidegger and Bultmann, contribute much to the process view of humankind (Cobb and Griffin 1976, 80-82). The oscillating emphasis on constraint and responsibility, on determinism and freedom, resonates perfectly with an existential analysis. We cannot escape the determining facts of our past, but we are free in each moment to respond to them—and then constrained anew in the next moment by what we have chosen, yet free to respond to that new set of facts in a novel way if we can muster the strength. To that incipient understanding of existence as a series of moments, a gradual "filling up" of one's life with choices, process thought adds the metaphysical claim that all of reality is constituted by a series of connected moments. In each moment there is a "decision"—not a conscious decision in the vast majority of cases, but instead a move toward completion that "cuts off" (note the connection to the Latin root of "decision") all other possibilities than the one in fact actualized. And then the newly created (and now dead and completed) fact becomes a factor in the material with which the next moment must deal. We recognize this model of existence in human life, but may overlook it in the non-human world because existentialist descriptions focus so heavily on the role of consciousness in this process. The "decisions" of the non-human world may not be as fraught with anxiety and nausea (to borrow Sartre's language) as our own, but they are no less effective at creating facts, which then must be assembled anew as the next moment balances briefly between the past and the future.

3. The Nature of the Human Individual

Before moving further along the continuum towards entities on a macroscale and considering how the larger community affects the human being, we must first pause at the level of the human being to ask how the community of actual occasions becomes an individual human being. Are we justified in calling the human being a single self? And if so, how does this singular self emerge from the multiplicity, nexus, and society of actual occasions that composes it at every moment?

Whitehead posits a "dominant occasion" or, to add the temporal dimension, a "thread of personal order" within complex (especially living) societies. This dominant occasion gathers data from the entire society, originates significant novelty that affects the entire society, and coordinates the activity of the entire society (*PR* 102, 107). The notion of a dominant occasion solves two problems in the process system. On the one hand, it explains the subjective feeling of self-identity. Normally we do not feel ourselves to be a collection of experiences and decisions all happening at once and then bundled over time, but a single strand of experiences happening to "me" and a single plotline of decisions made by "me." On the other hand, it allows for significant linguistic reference to individual selves. The commonsense notion that I can point to my friend Jane and positively identify her as a single person is validated by the concept of a dominant thread of actual occasions to which I am really referring with the name "Jane."

Yet another advantage, particularly for theologians interested in using process categories for religious interpretation, is that the dominant occasion may prove a satisfactory substitution for the concept of the soul. Some process theologians have even speculated that this dominant temporally-ordered society could continue its life after the death of the human body; namely, an immortal soul and life after death become real possibilities (Griffin 1971). Although Whitehead too speaks of the "personal living society of high-grade occasions" as "the man defined as a person […] the soul of which Plato spoke," and even speculated about whether this soul "finds a support for its existence beyond the body" (*AI* 208), there are some reasons why we might refrain from rushing too quickly to embrace this possibility. First, for Whitehead, the dominant occasion is a completely evolutionary notion. That is, in the natural history of the development of complex living things, creatures procured an evolutionary advantage by being able to coordinate and direct their sensation and activity through a central processor, so to speak. While it is certainly within the realm of possibility that this mental function might become more or less independent of its physical environment, this would require further evolutionary development that we cannot say for certain has already occurred. Second, the Greek concept of the soul is by no means identical with the Hebrew Bible's notion of the self as the animating force in the body, and the history of the development of this idea toward Platonic dualism is a checkered one. An attempt to confirm what is naively taken to be the New Testament concept of the soul by reference to Whitehead's dominant occasion may well end in confusion, based on the diversity and variety inherent in the former, and too simplistic a notion of the latter. On a philosophical level, it is probably safest to assume that the connection between the dominant

occasion in a human being and the actual occasions making up the body are crucial to the life of the human being as a whole.

However, the readily available correlation between the Whiteheadian concept of a dominant occasion and the Christian concept of a soul, no matter how many differences of detail separate them, is enough to cast some doubt on Whitehead's concept, at least when it is simplistically appropriated for the purpose of positively identifying the seat of the human self. Can a single strand of occasions, strung together like pearls on a fragile thread, sufficiently house the complex experience of consciousness, even if the occasions are highly developed and specialized? Is the normal human experience of self truly as unitary as this concept would presume? How would other experiences of self (as fragmented, non-continuous, multiple, socially constructed, etc.) be subsumed under this theory? What is the relationship of this temporally-ordered dominant society to the actual occasions that make up the physical brain, or the chemical events occurring within it? Some thinkers find Whitehead's thinking too hierarchical on this matter, since he sees the dominant occasion as the "monarch" that governs all the individuals and societies that make up the human being (Cobb and Griffin 1976, 87). In fact, the notion of a "monarchical society" of dominant occasions is the result of Whitehead's famous "ontological principle"—that whenever one points to a cause or a reason explaining an effect, one is pointing to an actual occasion (*PR* 19). The coordination of actual occasions in all kinds of societies and sub-societies in the human being, from the gene to the cell to the tissue to the organ to the self—can only be explained by reference to an actual occasion "doing" the coordinating. And so Whitehead posits other strands of dominant occasions coordinating the work of each sub-society at each level, all ruled by the dominant personal society that we call the human self. He writes: "The only strictly personal society of which we have direct discriminative intuition is the society of our own personal experiences," the dominant society (*AI* 206). Yet this sentence immediately illustrates the existential problem of the systematic elusiveness of consciousness. How is it possible that "we" can "have […] intuition" of our own dominant societies, when it is only those societies that are supposed to be the intuiting, knowing, thinking, and perceiving selves? What is this further "I" that is conscious of its own consciousness? Perhaps Whitehead refers only to the present member of the society prehending the society of entities in its past; nevertheless, if we are never conscious of the society in its up-to-the-moment form, that is, including its present incarnation, then we do not seem to be conscious of our *selves*, in the strictest sense of the word. Joseph Bracken, S.J., of Xavier University has proposed a field concept of the self, using Michael Polanyi's theory of a morphogenetic field, in order to provide a more nuanced and less hierarchical account of how coordination among entities and societies is achieved (Bracken 1981). Does this field concept build a bridge between Whitehead's atomistic actual occasions and the sophisticated, enduring aggregates exhibiting coordination and common form that we routinely experience? Are there other possibilities for filling this gap, or is the gap itself only illusory?

I have neither the expertise nor the space to delve into the many possible answers here, and can only invite the reader to explore the suggestions for further research at the end of the chapter. Suffice it to say that the constitution of the human self remains a key area for Whiteheadian thinkers to research, make proposals, and elaborate or revise the structure found

in Whitehead's writings. About the nature of the human being, however, and its relationship to its constituent actual occasions and societies, we must conclude for now that consciousness, whatever it is and wherever it resides, does not have a God's-eye view of the human being. It is unaware of some actualities that comprise it (such as lost memories or areas of the body that lack nerves), only dimly or intermittently aware of others (such as the ordinary activities of respiratory and digestive systems), and highly aware of others (such as inputs from the sensory organs). Its operation is, moreover, regularly interrupted by sleep, in which even the areas of high awareness are partially or completely shut down. It is vulnerable to many upsets, physical, mental, and environmental. And it is evident that consciousness's intuition of nearly all it perceives is indirect—that is, mediated through the activity of other actualities that help bring the percipient to the awareness of the human consciousness. Whether the directing and coordinating force in a human being turns out to be a dominant personal society or some less monarchical arrangement, we are talking about a flexible, robust, and specialized function in human existence that also turns out to be enormously fragile and limited in important ways. Such an observation restores the premium on intricate, resourceful cooperation among the many parts of the human organism, and mitigates the danger of reducing the human being to its "soul."

4. The Human in Community

Process thinkers are also indebted to the existentialists for help in expressing the contribution of larger communities to the nature of the individual human being. Existentialists rightly insist that the human being cannot be discussed in isolation from her environment. In fact, the only human being is human being-in-the-world, with the hyphens indicating that the elements of the phrase are neither distinguishable nor separable. However, for thinkers such as Camus, Sartre, and even Heidegger, there is no true community, in the sense of intimate participation with one another in mutual relationship. We recognize the Other as one trapped in the same structures of constraint and freedom as ourselves; we may resolve to act in moral solidarity according to that recognition, but we do not participate in each other or truly meet "man to man."

Whitehead's thought has engendered a set of approaches to various fields that have been felicitously termed "relational" theologies, philosophies, psychologies and so on. His system provides for real internal relations—the interpenetration of actual occasions with each other, or to put it another way, the *immanence* of actual occasions in each other. The relationship of the larger community (or communities) to the human being is not an accidental matter, then, to use the language of Aristotelian philosophy. In a very real sense, those larger communities *create* the human being, even as, in just as real a sense, the human being creates herself. Let us examine the modes by which various communities are immanent in the human being.

4.1. Human Communities

Humans are social animals, and so our most immediately intimate communities, on first glance, are those consisting of our own kind. It is obvious that these communities engender us by providing the genetic code that guides our development, and the social norms and folkways that

structure our experience. About the former we have no choice. About the latter we have no choice, either, when one considers our socialization as children. Both are simply "givens," aspects of the individual's unique spatiotemporal and social location. As we mature, we gradually gain the ability to respond in more flexible and innovative ways to those givens. Their inherence in us, however, as part of our background and training—their facticity as parts of ourselves, remains permanent.

Process philosophy is able to describe this phenomenon at a metaphysical level. As the human self grows from moment to moment, all occasions in its "world"—the subset of occasions with which the self has direct contact—contribute data to the emerging human being. The human being moves forward in life by setting all that data into a fixed pattern—a valuation of feeling. Each bit of data is felt in a certain way, with a particular tone and flavor to the experience. And as those feelings coalesce into a determinate feeling of the human being's world, the individual moves past that moment and on to the next one, carrying with it, as the starting point of its own continuing life, that moment of its immediate past in the form of a complete and unalterable fact.

Our existential experience, then, is that we are trailed by the ever-lengthening train of our past. Naturally as we move farther and farther along in our lives, we find it difficult to turn on a dime and do or become something new, as we might have done when we were young. Our ability to maneuver is restrained by the inescapable past that is a part of us. The more "filled up" our lives become with our facticity, the more difficult novelty becomes. But it is never impossible. To understand why this is the case, let us turn to the non-human realm, and first of all, to the divine community of which we are a part.

4.2. The Divine Community

For Whitehead, order and progress in the universe require an explanation, and according to his ontological principle, the explanation must be sought in the activity of an actual entity. God, although not qualitatively different from other actual entities, does have special properties that correspond to God's special function. At least two of these special properties are particularly relevant to our discussion of anthropology. First, God is in the immediate "world" of every emerging actual occasion. And second, God primordially orders and values all possibilities, then presents relevant possibilities to each emerging actual occasion as part of its world of data.

In combination, these two properties describe how novelty enters and persists in the world. An analysis of how human beings conceive and respond to the truly novel is an essential feature of philosophical anthropology in the twenty-first century. We now have several centuries of experience with an increasing pace of change in human societies and the impact of completely new realities (technologies, moral situations, experiences with human and non-human others, and experience of increased knowledge and specialization). Any anthropology that does not pay attention to that historical record and contemporary way of being in the world will be obsolete before it begins.

Novelty, for Whitehead, is the actualization in the world of a possibility that has never been actualized before. It does not spring into existence *ex nihilo*, but begins as a feeling of that possibility (termed an eternal object) by an actual occasion. Human beings can prehend

possibilities both directly (unmediated by another actual occasion) or indirectly (through the feeling of that possibility by an occasion in the immediate past, transmitted as part of the data contributed by that occasion to the emerging moment). But the particular contribution of God to the human being is to present *relevant* possibilities for novelty. These are possibilities that can be actualized, aimed at goals that humans and God can share, coordinated with the values being presented to the myriad other actual occasions coming to be at the same moment, and with the achievements and failures of the past. Without God's presence in the world of all becoming occasions and God's primordial ordering of possibilities allowing for specific, targeted propositions tailored to each occasion, the actualization of novel possibilities could only be haphazard and non-progressive.

At the level of the individual, membership in the divine community means the opportunity, moment by moment, to experience God's intimate closeness and respond to God's will. Note that in the process system human beings are always responsible for their responses (to make conscious use of a felicitous etymological kinship). In this view, the role of the human being in her own growth is to make decisions, while taking into account a wide and bewildering array of inputs. God's guidance is crucial in seeing what sense can be made of those inputs, as well as what previously unimagined possibilities might fit into that landscape.

This brief discussion of the divine community to which the human being belongs raises one of the ultimate anthropological questions, one anticipated in the first pages of this essay: What is the purpose of human existence? We have been occupied with human nature, but not, so far, human destiny or *telos*. One more community must be quickly surveyed, and then I will end by proposing a process-inspired answer to that question.

4.3. The Non-Human Community

While God is certainly a part of the non-human community in which human beings come to be, God's special activity and properties justify treating the divine as a separate category. Here we are considering what is sometimes termed the "environment"—the universe of non-human entities that surrounds the individual. We would not be stretching the truth too much to say that we are also considering the non-self entities that form the human body in its psychophysical functions. As we noted above, the human being is a multiplicity, and therefore it proves impossible to distinguish categorically the set of all occasions that make up the human being from the set of all occasions that do not. The human self persists in an "environment" of its own organs, tissues, cells, and subcellular structures; thus, entities that are not tightly integrated with the self, consciousness, or the dominant occasion (however one prefers to put it) might correctly be considered an environment for the human self.

And indeed, parts of the extra-corporal environment are ingested or otherwise brought into the body (food and air being the premier examples). Some of these (formerly) non-human entities become parts of the body: oxygen in the air binds to hemoglobin in the red blood cell, for example. Others pass through the body. Of course, given enough time, all the parts of a human individual eventually cease to be parts of that particular living individual, and become parts of some other community, whether it be the matter of my flesh decomposing (becoming part of some other living creature using me for food) or the ideational content of my thoughts

(becoming conceptual material for another's thoughts, if I have communicated them, or being preserved at the very least in God's inclusion of all realities).

The caveats that accompany the mere idea of distinguishing human from non-human demonstrate perfectly the process contention that the human being *is* a community, rather than merely belonging to one or more. As we think about how occasions that we do not identify with the human being are related to that human being, we cannot escape this deep interconnectivity, these internal relations. Whenever we try to extricate the human being from its environs, we find ourselves enmeshed by the linkages that reach into the very soul of the human being, and, conversely, into the experiences of the occasions that constitute its world.

Nevertheless, we may adopt some approximation of this concept of the non-human environment long enough to make a few observations. First, one of the strengths of Whitehead's system is its lack of qualitative difference between higher-order organisms (such as human beings) and lower-order organisms (such as, for instance, the animal and plant kingdoms). A metaphysics that does not primarily focus on defining human beings as unique, but instead on their continuity with other creatures, lends much support to ecological and evolutionary worldviews. (See for example McDaniel 1989, among many other extensive treatments of the compatibility between process thought and ecological ethics.) Second, our relationship to the non-human world is not exclusively defined by our genetic kinship with a primate ancestor. It is ongoing and far-reaching, because we are internally related to the occasions of matter and energy in our immediate world—and through them, to all occasions everywhere and everywhen. However, and as a final point, the process view is not egalitarian with respect to the different types and complexities of organisms. Humans do differ from their non-living environment in being personally ordered instead of being merely enduring. They differ from their vegetable environment in having significant mental processes that structure their experiences. They differ from (perhaps most of) their animal environment in having consciousness and language, and therefore in being able to ruminate on and communicate the value they place on their experiences. These differences represent important advances in the ability of the human being to carry out its role in the universal process. This is the final topic to which we now turn.

5. Aims, Purposes, Destinies

The existentialists, on whose insights I have relied heavily in this chapter, proclaimed that the human being has no purpose other than the one he gives himself. Process thought agrees. In the final analysis, the only human purposes that have actual existence are the ones that have been effective in shaping human lives. And it should be evident to everyone that these purposes differ greatly historically, culturally, and even at an individual level. It is misleading to search for the (singular) purpose of human life, because such a search consigns to illusion the myriad diverse purposes that humans have adopted and actualized. Such actualizations are, as Whitehead points out, the only real things in the universe (*cf. PR* 18).

However, process philosophy's endorsement of this fundamental tenet of existentialism does not preclude the reality of another dimension of purpose in which humans participate. We might

call this dimension divine, or we might call it universal. The ambiguity over where this dimension of purpose is housed arises from Whitehead's ambiguity over God's primordial aim. God works toward what Whitehead calls "intensity" for all occasions, as instrumental to achieving intensity in the divine becoming (*PR* 105). But is this aim something God chooses from a variety of possibilities for the divine purpose? Or is it the aim of the universal process itself, organic and eternal, as it were, with God playing only one role, albeit a key one, in achieving it? Process thinkers differ, but I lean toward comparing this purpose to the religious statement that God is love. Could God have chosen not to be love, or could God have chosen a different aim? The answer may be philosophically interesting; it may even be theologically crucial. However, the practical way to go forward is to take this purpose as inherent in the system that actually exists, and to focus instead on how God goes about trying to achieve it.

By "intensity" Whitehead means the achievement of both harmony and contrast held together in a synthesis. Because harmony (or, to use other Whiteheadian terms, repetition, identity, or permanence) is the prevailing feature of a universe of enduring objects, Whitehead focuses on contrast as the agent by which intensity is achieved. As an actual occasion emerges, the enactment of some creative disjunction with its past is needed to create this contrast. When unified, ordered, and valued along with the occasion's (repeated) past in the newly-formed fact, this contrast represents what Whitehead calls "intensity of feeling" (*PR* 249; *cf*. 27).

When considered at the human scale, intensity might come into focus in several ways. First, we could use the word "growth" as an approximation of one of intensity's facets. We are encouraged to embrace our past while seeking new challenges and new ways of finding a place in the world. Total harmony is stagnation; total contrast is chaos. As we move into each new moment, we can seek continuity with the past at the same time as we invent creatively in the present. The result is a human life that existentialists would call "authentic," accepting of its limitations and resolute in facing its challenges. Second, Whitehead's formulation of purpose avoids moral overtones in favor of aesthetic ones. We are not urged to do good works or be good people so much as to create good art out of our lives—quite a different meaning for the word "good"! Whitehead saw this turn away from moral categories in defining life's purpose as consistent with the use of the term "love" as an approximation of "intensity." He famously remarked that love is "a little oblivious as to morals" (*PR* 343), meaning that the question when one loves is not one of duty or utility, right or wrong, but union or separation—a question about form, balance, and intensity, a question, we might even say, of the beauty of the dance. Finally, Whitehead is careful to distinguish between the aim or purpose proffered by God (or by the universe through God), and the aim or purpose that the human being chooses, moment by moment. The former is the "initial aim" (*PR* 244-245) and the latter is the "subjective aim." (*PR* 244) The two are never identical, even in the hypothetical case in which the human being completely accepts God's aim for him, without a hint of dissent or modification. Because the subjective aim is precisely the goal that the human being has chosen for himself, regardless of its origin or content, it is distinct from God's proposal, experienced and felt differently than the initial aim, and effective as actual only in its subjective incarnation.

I will end this sketch of process anthropology with some speculative thoughts about human purposes so construed. The key dilemma for the process humanist, it seems to me, is the

effective marriage of the human responsibility to choose one's own purpose and destiny, to whatever extent possible, with the notion of a divine being who suggests to the individual relevant steps toward achieving a purpose consonant with that of the whole universe. It seems important to the process spirit not to construe God as a "smother mother," as Robert Neville once critiqued, constantly attempting to sign us up for God's projects rather than empowering us to pursue our own (Neville 1980, 9-10). Thus, the danger in overemphasizing the metaphysical advantages of internal relations over ontologies of substance is that the former can seem to leave precious little room for the human being to develop a plotline that is definitively hers. One clue to the answer, I suspect, lies in rethinking how human beings respond to the initial aim provided by God (Bowman 2002, 191-214). On the one hand, the image of response tends to picture the human being answering "yes" or "no" to God's proposal. The human reaction, then, becomes an acceptance of "God's will," or of some other inferior pathway. In this view, the question becomes whether one will be *obedient* to God or not, whether one will whisper with Jesus in Gethsemane, "Not my will, but thine be done." But if, instead, the initial aim is seen as a starting point for the self-causation that belongs entirely and properly to the human individual (a view consistent with Whitehead's explication), then it may be possible to see the projects of individual human beings as unavoidably (and even positively) conditioned by the way those around them, including God, are carrying out their own projects, without subsuming the individual's project to those of her communities. Clearly, cooperation among members of communities can result in more progress, and different kinds of progress, than is possible with individuals working alone. Yet individual genius, leadership, charisma, and creative spark also contribute to making lives and communities richer and more beautiful.

For process thinkers, human nature and destiny is bound up with the endlessly rich variety of an unfolding universe in the midst of its becoming. We are medium-scale examples of that becoming, talented and capable of special contributions, yet far from the universe's crowing achievement. As we create our lives by choice, creativity and constraint, we may respond to God and the universe in relationships founded on the trust that no beauty we foster will go unremarked or die without progeny.

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IV. Ecology

Ecology Between Natural Science and Environmental Ethics

Barbara Muraca[i]

In his works Whitehead never directly addresses the topic of ecology, so we must first explain the fundamental relevance of this term for process thought as well as the essential contribution of Whitehead's philosophy of organism for an ecological approach. It is no overstatement to assert that Whitehead's metaphysic can provide a coherent and adequate theoretical support for a hard-core ecological worldview. Whitehead offers a challenging framework for ecology as both a science and an ethical and spiritual vision. In the following article, I will first discuss this twofold nature of ecology, before turning to the relevant elements of Whitehead's philosophy and sketching the main developments offered by process scholarship.

1. Ecology

In the face of the urgent challenge posed by the environmental crisis in the last decades, ecology has come to be seen as inseparable from fundamental ethical issues. However, ecology is not synonymous with environmental ethics or environmental politics *tout court*. Since its emergence, ecology has increasingly developed as a science of nature, and in the second half of the last century it eventually became a discipline clearly situated within the framework of modern sciences and their methodology.[1] Yet, due to its own multilayered history, ecology cannot avoid facing up to the expectation that it represents a counter-tendency to the line of natural sciences. Ecology is suspended in a difficult balance between its newly achieved role as a biological "hard" science and the mission of being a sort of "leading science" that offers an overarching perspective intimately connected with normative and metaphysical claims (Trepl 1994, 17).[2]

1.1. Between Predictability and Complexity

Contemporary ecology has to maintain a balancing act between the exactness and predictability demanded by scientific methodology, and the need to resist narrow reductionism, which cannot grasp the high complexity achieved by the interactions between living organisms. For many

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contemporary scientists, ecology's scientific status remains questionable since it cannot count on a stable ground of certainty for its own claims. The complexity it has to deal with does not allow for precise predictions and strictly verifiable assertions. Within a strict neo-positivistic framework there is little place for a science confined to cautious assumptions and less willing to run risks about nature and its experimental modeling (Ott 1994, 33ff). Although ecology has adapted itself to be accepted among the exact sciences, it remains a discipline on the edge: the tight connection between descriptive tasks and normative questions throws ecology back onto the so-called naturalistic fallacy and underpins suspicions about its scientific claims. On the other hand, precisely because of its ambiguity, ecology challenges the natural sciences to question their established approaches.

1.2. Between Holism and Individualism

Due to its inherent affiliation both with the natural sciences and value-laden worldviews, ecology has always been extremely permeable to dominant paradigm in different epochs. During the first half of the twentieth century, especially in the United States, ecology became increasingly important as an overarching science providing support for the holistic paradigm that was then moving into the mainstream. In 1916 Clements proposed the concept of *superorganism* to designate a community of living beings; this would be to ecology what a single organism is to biology. Communities of living beings were thus considered as organic parts of a whole comparable to the parts of a living body that depend on it and serve its ends. The priority of the whole to its components met the needs of a specific epochal worldview and ran the risk of being misused to support the totalitarian and deterministic reduction of the individual to the whole (McIntosh 1985, 43ff). The counter-position to the holistic approach was developed by Gleason, who showed that no scientific proof of *superorganisms* as stable units could be given. On Gleason's account, a concept of community of living beings could be developed that reinforced the relevance of individuals in their interaction with external conditions (Trepl 1994, 154ff). Both the holistic and the individualistic tendencies are still alive in current ecological science and shape the ongoing struggle within many environmental theories.[3] It is very important to keep in mind this historical polarization and its risks when one calls for a holistic framework in opposition to the reductionistic tendency of contemporary science.[4]

2. Whitehead and Ecology

Although Whitehead did not directly write on ecology, either as a science or as worldview, his main philosophical works reflects the contemporaneous discourse of holism, as well as the debate between materialistic and organic approaches. Whitehead's contribution to the ecological debate addresses the following aspects:

(1) Philosophy, considered as critique of science, reveals reductionism to be the outcome of a specific worldview with very particular presuppositions.

(2) Whitehead's own philosophy of organism allows for both efficient and final causation in nature.

(3) Whitehead's concept of organism as a relational structure not identical with the animal body opens a path for an integral approach while avoiding the risk of slipping into the totalitarian consequences of holism.

(4) His concept of life anticipates the application of chaos theory and complexity theory to ecology and biology and supports them with a philosophical system.

(5) His concepts of value and internal relations offer environmental ethics a strong theoretical underpinning. Process scholars have focused on this particular aspect and developed it much further in the formulation of their environmental philosophies.

2.1. Philosophy as "the Survey of Sciences"

We might be tempted simply to equate Whitehead's philosophy, which he terms a "philosophy of organism," with ecology *tout court* and assert that Whitehead's philosophy is in the end a new ecology intended as a holistic system of thought. According to Whitehead, however, philosophy has a wider task than does any holistic ecology: it must offer constant criticism of the abstractions that science needs in order to shape a coherent system of thought. The task of philosophy is precisely to recover what abstractions leave out (*PR* 15), by questioning them and constantly re-opening the process of delimitation. Philosophy and ecology are not the same, since "philosophy is not one among the sciences […]. It is the survey of sciences […]. It confronts the sciences with concrete fact" (*SMW* 87).

Philosophy as "the critic of cosmologies" (*SMW* vii) can scrutinize the concept of nature that classical mechanics has assumed. This concept is

> the ultimate fact of an irreducible brute matter, or material, spread throughout space in a flux of configurations. In itself such a material is senseless, valueless, purposeless. It just does what it does do, following a fixed routine imposed by external relations which do not spring from the nature of its being. It is this assumption that I call 'scientific materialism' (*SMW* 17).

In order to support its assumptions, materialism relies on immediate empirical facts collected by induction. However, if we consider experience as wider than mere sense perception constrained within the narrow borders of laboratory experimentation (*SMW* 17, 53), it seems at least dubious that we may find any immediate empirical givenness of bare matter.[5] The modern concept of nature, far than being the obvious outcome of empirical observation, results from a restricted focus on measurable qualities, like weight, size, speed, and the exclusion of other aspects like color, smell, taste.

By abstracting from all non-measurable aspects, science accomplished a *bifurcation* of nature between a subjective and an objective world and excluded experience from the latter (*SMW* 146), with the further consequence that the percipient (human) subject had to be excluded from nature and posited in opposition to it (Hampe 1990, 39). Therefore subjectivity and teleological activity were thrown out of nature and attributed to the separate sphere of the human. However, the materialistic-mechanic theory of nature, with all its reductionism, encounters insurmountable difficulties when it tries to describe life in its dynamic and unpredictable complexity.

2.2. Whitehead's Philosophy of Organism

Neither evolution nor any kind of advance into novelty can be explained simply by external mechanic relations among bits of matter blindly running in empty space and entirely devoid of subjectivity.[6] The philosophy of organism claims that

> however far the sphere of efficient causation be pushed in the determination of components of a concrescence—its data, its emotions, its appreciations, its purposes, its phases of subjective aim—beyond the determination of these components there always remains the final reaction of the self-creative unity of the universe (*PR* 47).

Since pure deterministic relations of efficient causation can by no means account for the counter-tendency observable in the universe that resists decaying into mere repetition and dissipation (*FR* 27ff), Whitehead develops a concept of organism intended primarily as the outcome of "a selective activity which is akin to purpose" (*SMW* 107).[7] What is intended here is not a monistic principle that holds the universe together and leads it to a specific general aim. Rather, nature is considered as an evolving process brought about by fundamental self-creative events that are each an "individual act of immediate self-enjoyment" (*MT* 151). Whitehead's cosmology is essentially pluralistic.

Moreover, Whitehead distinguishes between two meanings of the term organism, one microscopic and the other macroscopic. The former is intended as the fundamental activity of actualization into an individual unity of experience (*PR* 129), whereas the latter refers to complex enduring structures like the ones we find as "stubborn facts" in our world of experience.

2.2.1. Microcosmic Organisms—Actuality between Determination and Teleology

Anything that emerges into actuality from a background of potentialities for realization requires a process of valuation, selection and choice among all relevant possibilities, one which is not simply given by mechanic external relations (*SMW* 93). Therefore, the ultimate realities of nature must be thought of as actual entities that shape themselves anew arising out of the determining effects of their relevant past and attaining an end for themselves (*FR* 30).

No form can grow automatically from an infinite range of possibilities because of the "cross-currents of incompatibility" (*PR* 247). Determination as such would lead to great incompatibility without an activity of ordering and shaping, which implies a free decision among all given possibilities: causation (intended as internal, in-flowing relation) and concrete freedom (intended as self-realization) in this case coincide (Muraca 2005, 237ff).

Each actual entity, which Whitehead also terms an actual occasion of experience,[8] is a complex node of freedom and causation: past entities "act" as vectors of efficient causation upon the new becoming entity; however, they cannot fully determine its shape, since the way in which the influences of the past are bound together to give birth to a new entity depend on the decision made by the new entity itself (*PR* 86). This process is termed by Whitehead "concrescence" and refers both to the growing together (*cum-crescere*) of past influences into a new shape, and to the becoming concrete of potentialities for realization.

While bits of matter are devoid of experience and subjectivity and are connected merely through external relations, organisms in their microcosmic meaning are loci of experience[9]

understood as active graspings of causally efficacious influences in a new form of realization. Accordingly, each actual entity takes account of, or *prehends*, other entities as constitutive components of its becoming and is internally related to them.[10] As such it is a *prehensive* unity of past influences, a new togetherness achieved by means of valuation among the high range of possibilities for realization (*SMW* 105). Hence, each actuality *is* a value and, as long as it becomes by growing from its past into a new self-attained shape, it is a subject: "'value' is the word I use for the intrinsic reality of an event" (*SMW* 93).

2.2.2. Macrocosmic Organisms—Wholes and Parts in Dynamic Fields of Relations

Actual entities arise, become and perish; they never occur twice and never change (*AI* 204). Therefore, each actuality is absolutely unique and unrepeatable. However, permanent structures are not simply an illusion. So-called enduring objects like stones, planets, plants, and animals result from different modes of organization and relations among actual entities, which incorporate, manifest and reproduce common patterns. Permanence is thus the result of the repetition and positive valuation of patterns entertained by actual occasions of experience. This suggests that permanence has, with respect to its being actual, a derivative status due to the internal relatedness of all actual entities and their tendency to conformity.[11] This kind of process, which Whitehead terms *macroscopic,* refers to the *transition* "from attained actuality to actuality in attainment" (*PR* 214), in which past realizations are constituents by means of repetition of a new becoming actuality.

Macrocosmic organisms are organized enduring structures, in which patterns are relatively stably repeated: "the community of actual things is an organism" (*PR* 214). This definition might remind us of Clements' concept of *superorganism*, yet Whitehead distinguishes different kinds of grouping of occasions depending on different modes of organization and does not equate organism with the organizational structure of an animal body (Hampe 1990, 174) as Clements seems to imply:

(1) A general connectedness due only to the mutual immanence of actual occasions without common relevance is termed a "nexus" (*AI* 201). Any kind of togetherness can be a nexus, included mathematical concepts of class.

(2) A nexus of actual entities reciprocally "ordered" is termed a "society" and requires that its members are alike because they "impose on other members of the society the conditions which lead to that likeness" (*PR* 89). A society presents a common element of form entertained by all its members by means of their internal relations and reproduced by future members of that society. Most enduring objects are structured societies, like molecules or crystals.

(3) A society with a serial or temporal order is termed "personal" and presents a route of occasions "which in a marked degree […] inherit from each other" (*PR* 89). A personal ordered society does not necessarily imply being living; nor does it require consciousness. It mainly refers to the temporal series of occasions, connected by a strong relevance to each other.

(4) Structured societies are also termed "corpuscular" and do not present any dominant route of actual occasions of experience. They can be mainly living or non-living according to their degree of novelty, although there is no sharp line to be drawn. A corpuscular society does not have an aim as a whole, although its members do constitute, even if almost negligibly, a fringe

of teleological self-realization. Aggregates like stones result from the average effects of their members: even if some kind of novelty arose in some of the members this would not have a significant effect on the general structure, repeating itself over long lapses of time: "For lifeless matter these functionings thwart each other, and average out so as to produce a negligible total effect" (*AI* 207).

Living structures instead aim at novelty and let it emerge as relevant for the whole society instead of evening it out for the sake of stability. Therefore, they have to constantly maintain a balance between dismembering novelty and steadiness. Moreover, living structures have a better coordination among the members than non-living ones, even if they do not have a superceding personal society assigned to this task.

A complex society like an animal or a human being is constituted by both ordered societies and nexūs as well as by a subordinate personally ordered society, which seems to dominate their social system (*AI* 205). While the animal body is a complex non-personal society, yet very strictly structured and self-sustaining, a serially ordered society presents a dominant route of occasions eminently connected and is termed by Whitehead a "psyche" or a "soul": "The soul is nothing else than the succession of my occasions of experience, extending from birth to the present moment" (*MT* 163). As David Griffin points out, the dominant occasions constituting a soul do not differ *in kind* from other personally ordered societies like for example living cells; yet, "they are enormously different in degree" (Griffin 2001, 120). [12]

2.2.3. Life on the Edge of Chaos

When actual occasions largely conform to the givenness of the past world relevant for them, we find order and stability,[13] but also negligible novelty and somewhat less complexity. In fact, in order to reproduce the patterns, incompatibilities need to be either excluded or integrated in a way that does not dismember the common element of form and the community of actual things, i.e. the organism achieved. Exclusion by means of abstraction allows for endurance and a conforming stability.[14] Yet, in a constant process stabilization is never simply a neutral state: in the long run it leads to relapse. The universe bears a tendency to degradation, which is exhibited for example by entropic decay.

If this were the whole story, life would have never made its appearance on the scene, since "a high grade of complexity will in general be deficient in survival value" (*PR* 101). The counter-agency operating throughout the universe arises as the urge to "live, to live well, to live better" (*FR* 8). Whitehead calls the place of anarchy, in which radical novelty can arise, an "entirely living nexus," which is characterized by a high degree of originality in all its members.[15] Accordingly, an "entirely living nexus" is with respect to its life non-social (*PR* 107), i.e. it is not strongly determined by other occasions or nexūs. Its degree of freedom is extremely high and thus the risk of falling into sheer chaos with no conformity at all to the environment is dramatic. Whitehead seems to imply here that the quintessence of life is tied to the risk of chaos intended as loss of conformity and of repetition of patterns. If this chaotic non-social activity were absolutely released from any tie to the environment, this would indeed hinder the formation of organisms and structures. However, as Whitehead points out, "though life in its essence is the gain of intensity through freedom, yet it can also submit to canalization and so gain the massiveness of order" (*PR* 107), i.e. the possibility of a certain provisional stability. A

living society is constantly swinging on the edge of equilibrium between conformity and loose novelty, engaging in a steady effort of coordination of the anarchic spontaneities throughout the occasions forming a society.[16]

Accordingly, life is the solution that structured societies have found in order to develop complexity, allowing at the same time for a high degree of novelty without being fated to instability. The power of living societies consists in their capability to canalize the several influences of the actualized world into new complex forms, instead of eliminating incompatibilities: "Apart from canalization, depth of originality would spell disaster for the animal body. With it, personal mentality can be evolved, so as to combine its individual originality with the safety of the material organism on which it depends" (*PR* 107).[17]

Due to their unsteadiness, living societies are reliant on a much tighter interplay with the environment and undergo a constant process of re-storing and self-sustaining activity, which we call metabolism: "the structure is breaking down and being repaired. The food is that supply of highly complex societies from the outside which, under the influence of life, will enter in to necessary associations to repair the waste. Thus life acts as though it were a catalytic agent" (*PR* 106).[18]

2.2.4. Whitehead's Relevance for Ecology: First Conclusions

Whitehead's philosophy of organism offers to ecology a supporting scheme of systematic thought in many ways.

First, Clements' concept of super-organism seems to be more of a sort of a larger individual constituted by its subordinated parts. If this is true, holism and individualism are less in opposition than it might look like. It is more a matter of which unity plays the major role: either the whole is prior to its parts or the individual parts are prior to their whole.

According to Whitehead, there are no isolated societies. Each society is inseparable from its environment, which must contribute as well to its self-sustaining process: "the environment, together with the society in question, must form a larger society" (*PR* 90). Societies and nexūs for Whitehead extend over each other and are continuous in the sense that there is no strict isolation of any society from the relevant relations constituting it. Considering this dynamic interconnection among societies (i.e. macrocosmic organisms), we can refer to them as wholes, yet only in the specific sense of relative and provisional wholes, depending on the perspective from which they are looked at: "I shall use the terms 'whole' and 'parts' exclusively in this sense, that the 'parts' is an event which is extended over by the other event which is the 'whole'. […] Every event extends over other events, and every event is extended over by other events" (*CN* 58-59).

Moreover, depending on the kind of society we address, we have different kinds of relations between dynamic and provisional wholes and its components. Some "wholes" correspond more closely to what we understand as an animal body, a structured society endowed with a certain hierarchical order and tight reciprocal dependency. This would be an organism in the common sense of the term. Even in this case, in which mostly the part serves the whole, the relation between wholes and parts is reciprocal.[19]

Other "wholes," however, are much looser and less structured. They look more like fields of relevant relations, characterized by common elements of form and dependent on each other by means of internal relations in a less hierarchical sense. These are also termed organisms, but they are quite different from the first ones.

Whitehead's philosophy of organism allows for a concept of constitutive relationality and intimate interconnectedness between wholes and parts, including a certain kind of priority of the wholes to their components: "In a society the members can only exist by reason of the laws which dominate the society" (*PR* 91). Yet, this does not lead to a one-sided subordination, in which the members are reduced to mere parts. In fact, societies as macroscopic organisms are derivative in their being actual and efficacious from the actual entities that actualize them: "The society is only efficient through its individual members" (*PR* 91). The relation between "wholes" and "parts" can only be a dynamic interdependency.

Accordingly, the "whole" is more than the sum of its parts and presents characteristics that cannot be simply found in the parts.[20] Since relations are internally constituting the subordinate organisms are intrinsically different according to the relational field or the larger organism in which they are located. The plan of the larger whole goes down to the smallest organisms and has effects on them. That is to say that an electron within a living body is *qualitatively* different from one in a different structure or state. Reductionism is rendered impossible by the ontological priority entertained by internal relations in Whitehead's philosophy.

Second, Whitehead's theory of life is incredibly close to the recent application of chaos and complexity theory to biology and ecology. According to complexity theory, "nonlinearity and collective behavior are characteristic features of complexity" (Solé & Goodwin 2000, 58). Hence, predictability is rendered impossible by the fact that collectives break symmetry and instead of reproducing sameness tend to repeat patterns in the mode of similarity; eventually they might choose a highly improbable path with respect to the given conditions and their standard settings. Whitehead's organisms are embedded in and constituted by a web of patterns, most of which tend to be repeated in a similar way, with a certain degree of difference and novelty.

Chaos is understood by most chaos-theories as non-conformity to general rules (sheer chaos would be the condition in which all possible states are realized with no regularity and no repetition), whereas order represents conformity (the maximal conformity would be that only one status is realized by all entities at stake). Complexity is located at the unsteady edge between order and chaos, i.e. where a high variety of patterns emerge with some similarity and dynamic regularity over time. This dynamics takes the form of fluctuation.[21] For Whitehead, complexity is the fringe where causal efficacy of the past (conformity and order) encounters the teleological self-shaping activity of the becoming occasions to bring about enduring structures. By considering teleology as an element in nature, Whitehead ventures much further than the new approaches in natural sciences, which often remain caught within a deterministic framework even if it is non-linear (Muraca 2007).[22]

In this framework, life represents the most improbable organization of patterns suspended on the edge of disorder. It only takes place out of a state of equilibrium and constantly needs to re-

establish its unsteady balance through self-organization and metabolism. Therefore, life is an extremely fragile status, constantly exposed to the risk of collapsing.

3. Environmental Ethics and Process Thought

According to Whitehead each "fact" in the world is the outcome of valuation and therefore bears aesthetic as well as normative aspects. On this account science cannot avoid the ethical questions that are enmeshed in most descriptive claims. Ecology and environmental ethics are intimately linked up, as several process thinkers have shown. In this section I will briefly outline the main positions on this topic within process scholarship.

As Whiteheads maintains, actualization results from a process of evaluating self-realization and *is* therefore an intrinsic value. However, not all intrinsic values are the same: actual occasions in their process of becoming according to their inner complexity and breadth can achieve higher or lower degrees of novelty: "Each occasion exhibits its measure of creative emphasis in proportion to its measure of subjective intensity" (*PR* 47).

Whitehead's theory of value opens a path for relevant contributions to environmental ethics. Although Whitehead himself never addressed environmental issues directly, his philosophy of organism has served as the main source for the development of a rich tradition within process thought in the field of ecology as a normative worldview.

3.1. The Ecological Model

The Liberation of Life by John Cobb and Charles Birch represents a milestone for process environmental ethics and has been the object of animated discussion among process scholars for years. The book aims at offering a new paradigm called "the ecological model" for ethics, spirituality as well as politics. Strictly speaking it is therefore not only a contribution to the environmental debate, but also to the wider context of sustainability and social justice.

The ecological model draws on Whitehead's philosophy of organism and like it challenges materialistic mechanism with its metaphysics of substance and Cartesian dualism. Cobb and Birch propose Whitehead's "event-thinking" as a radical alternative to substance thinking.[23] Following Whitehead they draw attention to the interconnectedness based on internal relations that constitute every event and every complex structure. According to Birch and Cobb value is intimately connected to experience and subjectivity, although neither term necessarily implies consciousness and sense perception. All events are considered actual occasions of experience and "since experience is always valuable, events have intrinsic value. All things therefore have some intrinsic value either in themselves or in their constituent parts" (Birch and Cobb 1990, 141).[24] Intrinsic value is to be found at all levels in the universe, although this does not imply that everything that exists has intrinsic value as a whole. Referring to Whitehead's distinction among different types of organizational structure, aggregates do not bear intrinsic value as a whole, while organisms with a dominant route of occasions (e.g. something resembling a central nervous system) do. However, the constituent parts[25] of any aggregate do have *some* degree of subjectivity and therefore they are not completely bare of all value.

The ecological model is not egalitarian with respect to the moral standing of intrinsic values. In fact, intrinsic values can be differentiated and ranked according to the criterion of richness of experience or, as Cobb maintains, "strength of beauty." Therefore organisms with a richer and more intense degree of experience bear a clearly higher intrinsic value.[26]

3.2. The Ecological Model Discussed

While Birch and Cobb acknowledge that life is a value and that animals, having a high degree of intrinsic value, "are not mere means to human ends" (1990, 157), they do not agree that animals have an absolute right to life. They emphasize the comparatively low degree of anticipation, which entails that most animals do not fear death as humans do. They consider, for instance, the relatively low significance of singularity in the experience that one particular chicken might have compared to the possibility of experience of another chicken. Therefore they accept the replaceability argument for there being lesser degrees of intrinsic value, although they acknowledge vegetarianism as a vital ethical choice, given the conditions in which animals are in fact treated today.

This argument has provoked a fierce reaction among several process and non-process thinkers, who see in Cobb and Birch's position a reworking of the utilitarian concept of individuals as mere receptacles of value (Palmer 1998, 22). Palmer draws mainly on this aspect to show the inadequacy of process thought for environmental issues,[27] since it cannot do justice to individuals. However, one can reject Palmer's argument recalling the importance of singularity within a Whiteheadian framework (Muraca 2005a, 103) and the fine distinctions between so-called "democracies" (e.g. plants) and "monarchies" endowed with a central nervous system and therefore with a high-grade singularity (e.g. animals and humans). Menta, referring to Hartshorne, points out that while democratic organisms, including ecosystems, bear intrinsic value in a more aesthetic sense, monarchic organisms have moral standing *tout court*, since they show interests and needs as a whole (Menta 2004, 26-27). As such their intrinsic value is not something that can be simply "bargained" over in terms of quantity and intensity independently of the singular individual that achieves it. John Cobb himself has clearly pointed out that the main differences between process thought and Deep Ecology are both the consideration of individuals as non-reducible to the whole of which they are parts, and the non-egalitarian conception of intrinsic values (Cobb 2001).

3.3. Animal Rights

As Daniel Dombrowski has shown, process thought can be extremely fecund also for the animal rights debate. Criticizing Birch and Cobb as well, Dombrowski rejects the replaceability argument as a "fallacy of misplaced concreteness." According to him, species are only abstract concepts and cannot be considered as a bank of replacements for individuals. Moreover, given the uncertainty about the future it does not seem very convincing to support any argument in favor of an elimination of present value in the name of a possible future value to replace it (Dombrowski 2001, 27ff; *cf*r. Deckers 2004). Dombrowski distinguishes between a "microscopic sentiency" S1, by which he refers to the subjective activity that can be found in less complex organisms like cells, and a sentiency *per se* S2 "found in human beings and other

animals that are metaphysical monarchies by virtue of their central nervous system" (2001, 26). Given the binary choice between saving a human life and the life of, say, a bird, the human life ought to be saved; but in most non-extreme cases acknowledging different degrees of intrinsic value does not automatically entail that birds do not value their lives or do not have a right to live. Dombrowski refers to the argument from marginal cases to show that if we were to extend the concept of anticipation of death and the distinction between mentally developed and mentally undeveloped animals in order to justify taking animal life, we would inevitably fall into counterintuitive contradictions. Regardless of animals' state of development, it is their sentience and hence their capacity to suffer that plays the major role in ethical decisions.

3.4. Life-centered Ethics

Similarly, Jay McDaniel draws on the distinction between democracies and monarchies (McDaniel 1989, 77ff) and allows for distinguishing different degrees of intrinsic value, although no *a priori* ranking can be made once and for all. By acknowledging that it is humans who rank other creatures, McDaniel stresses that when a decision is inevitable humans need to rely cautiously on their own experience, while avoiding arrogance: "the need for judgment on the basis of degrees of value must be complemented by reverence for life," knowing that God loves each creature on its own term and for its own sake (1989, 84). To say that intrinsic value is to be found everywhere does not imply automatically that everything has a moral standing. Intrinsic value involves *prima facie* an aesthetic consideration, which plays an important role for any reverent attitude towards life. However, not every organism or entity endowed with intrinsic value automatically deserves moral consideration, since "many more things have intrinsic value than have rights" (1989, 69). Animals are moral patients and therefore have rights, even though these rights are not absolute. Yet, the burden of proof for violating animals' interests lies with human, who are not only moral patients but also moral agents (1989, 68).

3.5. Extrinsic Values

Process scholars are actively involved in the current discussion within environmental ethics about the attribution of intrinsic value only to individuals, and even here only to humans or to humans and animals endowed with higher forms of mentality and sentience, or to extend this attribution to other categories like the ecosystem or biosphere (see Moses 2000). Most environmental ethicists tend to focus on intrinsic and inherent values as the basis of moral consideration; they thus risk the pitfall of moral impasses[28] connected with too wide an enlargement of intrinsic value in nature.

However, one specific contribution that process thought can offer to the contemporary debate is precisely the emphasis on the ethical relevance of values other than intrinsic ones. Given that relations in a process framework are internal, intrinsic values cannot be considered in isolation. In fact, entities in virtue of the constitutive interrelatedness of all beings also bear so-called instrumental values.

As Griffin points out, there are at least three ways of understanding value in Whitehead: "value of an individual for itself; value of the diverse individuals of the world for each other; value of the objective world which is a community derivative from the interrelations of its

component individuals, and also necessary for the existence of each of these individuals" (*RM* 48; see Griffin 2001, 89). While the first refers to what we call intrinsic value, for the second concept Griffin prefers the term "extrinsic" over the more usual instrumental value. He defines extrinsic value follows: "While it is a subject enjoying experience, an actual occasion has intrinsic value, value for itself. When it becomes an object for others, it has extrinsic value, value for others" (Griffin 1993, 198). The extrinsic value cannot be considered as a mere external mean or instrument, which can be taken in possession, used or enjoyed by humans. Rather, an extrinsic value is the value for other things, "be they plants, animals, humans, or God" (2001, 202). According to Griffin, extrinsic values include

> *companion value*, *instrumental value* (in the narrow sense, such as a stick's value to a bird in ferreting out bugs from a tree limb), *aesthetic value*, and *medicinal value*. Some forms of extrinsic value are such only to human beings, such as *scientific value*, *monetary value*, and *symbolic* (including *moral* and *religious*) *value* (2001, 193).

Aesthetic value and medicinal value are not exclusive to humans, since animals as well seem to enjoy beauty in nature and at times use medicinal qualities of plants and roots for their well-being. This is a typical process assumption, which is all too often neglected by other approaches.[29]

Moreover, to the extrinsic value of anything belongs, according to Griffin, its *ecological value*, i.e. "its value for sustainability of other parts of the earth's ecosystem" (Griffin 1992, 18). Ecological value and intrinsic value are often inversely related:

> Those species whose (individual) members have the *least intrinsic value*, such as bacteria, worms, trees, and plankton, have the *greatest ecological value*: without them, the whole ecosystem would collapse. By contrast, those species whose members have the *greatest intrinsic value* (meaning the richest experience and thereby the most value for themselves), such as whales, dolphins, and primates, have the *least ecological value* (Griffin 1993, 203).

As a consequence, not only the intrinsic value of each single individual for itself ought to be taken into account, but also the relational factors as constitutive of its *total* value (Griffin 1992, 18). This conception allows for a high moral consideration of relational structures like ecosystems without considering them endowed with intrinsic value. Moreover, by focusing on the essential interrelatedness of all things it calls attention to the moral relevance of relations as prior to individuals, without risking a reduction of individuals to mere functional parts of wider wholes.

3.6. The Kalogenic Model

In his work dedicated to postmodern process ontology, Frederick Ferré holds that, since the process of becoming of each actual entity gives rise to beauty, it can be termed a kalogenic process (literally "giving birth to beauty") (Ferré 1996, 340). Like all process thinkers, Ferré emphasizes the essential importance of relations and explains the difference between internal and external relations in terms of degree of responsiveness to influences.[30] On this account he maintains that instrumental values play a major role in any environmental ethics.

Accordingly, Ferré proposes a more precise distinction between the different types of organizational structures with respect to the question of value in an ecological framework.

Things like stones and mountains can be considered *aggregate* entities. These structures result from the aggregation of many different elements, which are for the main part externally related among them and to their surrounding (1996, 326). They do not have an aim as a whole, i.e. no aggregate as a whole has either experience or value, or is endowed with subjectivity of any sort. Nevertheless aggregates are not completely bare of intrinsic value, which can be found in their constituent parts, and can very well bear dramatically relevant instrumental values.

Systematic entities, like ecosystems, are entities that bear a much higher internal coherence than mere aggregates. A system is intended as having "a whole relative (stochastic) stability over time;" it has an intrinsic property of resiliency that "is not simply attributed, but found" (1996, 327). Systems are wholes with internally related parts (1996, 331). Referring to Golley, Ferré asserts that an ecosystem can be considered as a "weak whole," which is responsive both to its environments and to the delicate interactions among its own components. Moreover, it is a dynamic structure endowed with a reciprocal relation to its environment and not merely responding to it (1996, 314). Systematic entities are somehow *teleological* since they have a tendency to "continuous self-correction toward the maintenance of a central value" (1996, 328). Ecosystems are therefore "stochastically self-determining resilient systematic entities."

Species do not seem to be entities at first, since they do not act in any sense, not even in the sense in which we might say that an ecosystem is "active." Neither do they have interests of their own. Ferré argues that species seem to be more mental than empirical. He calls them *formal entities* with a temporal development. Species are *temporal entities* and can therefore be endangered or disappear. Species are ultimately the result of (and seem to be as well the condition for) historical processes of growing complexity: "all individuals carry more 'load' (more possibilities for genetic expression) than is needed for the individual" (1996, 330). As some ecologists maintain, species can be considered as "historical individuals" and therefore have a moral standing.

Organic entities are living systems "capable of novelty, improvisation, evolution, growth—in a word, creativity" (1996, 331) and are constituted by tight internal relations among one another. However, the degrees of novelty and tightness of bond between the parts are very different depending on the level of complexity achieved.

Persons are intended by Ferré not in Whitehead's technical sense of a serially ordered society, which could as well be a cell or even a molecule. While the latter are termed by Ferré *compound* entities, the term person refers only to higher organisms, endowed with the capacity of thought and symbolism. As he writes, "on Earth only humans are persons" (Ferré 2001, 141).

From this account of the differentiation among various structures Ferré deduces the ethical significance for axiology as well as for deontology. While organisms and persons possess intrinsic value, aggregates and systemic entities as well as species are ethically relevant for their instrumental values, which does not imply that they have a lower moral standing. Addressing biodiversity Ferré argues that in spite of its lack of intrinsic value, "it can be a compelling instrumental value which, multiplied by indefinitely large numbers of kalogenic individuals, can outweigh the intrinsic value of individual organisms" (1996, 138).

Ferré therefore proposes three maxims of ethical behavior ranked according to the different values that are at stake. (1) First, *do no harm*. For, all other things being equal, there is no

reason for destroying even an aggregate; it does not have intrinsic value as a whole, but is constituted by processes endowed with intrinsic value and deserves at least our appreciation. (2) Second, *protect existing good*. This maxim applies particularly to the natural world threatened by our behavior. (3) Third, *create new good*. This maxim applies to the human cultural world and its great value with respect to the possibility of richness of experience.[31]

3.7. Ecofeminist Process Theologies

Although it is impossible to do justice here to this complex field, I will briefly outline three main approaches that are complemented by Carol P. Christ's own entry in this volume.

Whitehead's thought can offer a remarkable basis for the development of ecofeminist's perspectives and, as Nancy Howell clearly shows, especially "for a feminist theory of relations" (Howell 1988, 78), provided that the hierarchical aspects of his philosophy are criticized and modified according to feminist post-patriarchal concerns.

Howell's criticisms address the interpretation of Whitehead's cosmology offered by the "ecological model," which allows for hierarchy among different degrees of intrinsic values and therefore introduces a ranking among creatures. According to Howell, "from the perspective of feminist consciousness, this hierarchy seems unlikely to effect the liberation of life that Cobb and Birch envision for nature," since it risks reproducing the patriarchal pyramid of domination (1988, 85-86).[32] Moreover Howell emphasizes Whitehead's refusal to draw sharp lines of distinction between living and non-living, and among living beings. On this account she claims the relevant contribution of process thought for a framework that takes primate culture seriously, also in a theological perspective.

Referring to the debate between holism and reductionism, Sallie M*cf*ague maintains that reductionism does not do justice to individuals and their difference. In fact, the reduction of the world as "obviously rich, diverse, intricate, interrelated and interdependent" to its smallest constituents does not take differences into account and seems to be heavily opposite to our common sense (M*cf*ague 1993, 93). While reductionism can by no means include any holistic perspective, a holistic metaphysics based on process thought can account for both the reductionistic methods of research and the recognition of "wholes" as complex interrelated dynamic structures. A holistic approach does not necessarily have to be a denial of difference. Rather, as is the case in a process feminist approach, holism refers essentially to differences and plurality. The philosophy of organism can respond to the need of a holistic metaphysic without underestimating the individuals, as M*cf*ague points out: "the organic model […] acknowledges the well-being of both the whole and the parts" (1993, 96).

Moreover, M*cf*ague draws on the epistemological criticism developed by Kuhn as well as by Sandra Harding about the historicity of worldviews and their connection to mainstream dominant models, in order to develop viable frameworks for a theology aware of the environmental crisis. Since all attempts to speak of reality are in the end metaphorical and performative in their intimate connection to power, the metaphors we choose do have a dramatic impact on our visions and behavior. Referring to Whitehead's and Hartshorne's theology, she proposes the metaphor of the world as the Body of God.

Among process feminist scholars, Catherine Keller is one of the few who have drawn on Whitehead's philosophy of organism stressing its connection with chaos theory and showing its relevance for ecology as well as theology (Keller 2003). By focusing on Whitehead's concept of an "entirely living nexus" as a non-social nexus, Keller shows the importance of the chaotic element as the origin of life, a vibrating pulsation that interrupts continuity while at the same time re-building it (Keller 2001).[33] On the edge of encounter between process thought and post-structuralism, Keller reconstructs the increasing phobia of chaos rooted in Western tradition, the fear of the "tehomic" as it is called in *Genesis*, a "deep" that has to be mastered and put under control, since "chaos or tehom is that which resists a status quo order." Life on the edge of chaos becomes for Keller a locus not only for ecological claims but also for a complex criticism of power and structures of domination.

Notes

[1] While this tendency can be observed along the whole history of the discipline, a quite decisive move in this direction occurred, according to McIntosh, after World War II, with the attempt to base ecology on stronger mathematical methods as well as on higher theoretical generalizations (McIntosh 1985, 242ff.).

[2] According to Ott, ecology in a strict sense refers only to a subfield of biology and is therefore one of the sciences. Ecology is concerned with "the identification of matters of fact and ecosystemic relations as well as with mathematical modeling of ecosystems and the elaboration of theories" (Ott 1999, 2; my translation). Hence it is wrong to consider environmental claims as belonging to the specific field of ecology. Ott aims at a more precise differentiation of the two fields. However, it seems hard to deny that the historical discourse about ecology has been enmeshed with ethical consideration. In this article I will not engage in this particular debate but will refer simply to the historically established discourse and the contribution of Process philosophy and theology to it.

[3] The application of system theory to ecosystem analysis offers a good example of this on-going debate.

[4] For a detailed presentation of this debate see McIntosh 1985, especially Chapter 7.

[5] For Whitehead this is a narrow, overly abstract perspective: "For us the red glow of the sunset should be as much part of nature as the molecules and electric waves by which men of science would explain the phenomenon" (*CN* 29).

[6] Whitehead writes: "The aboriginal stuff, or material, from which a materialistic philosophy starts is incapable of evolution. […] There is nothing to evolve, because one set of external relations is as good as any other set of external relations" (*SMW* 107).

[7] Whitehead's "organism" is not identical with a biological body even if it includes it among its forms. For an animal body presents a specific organizational structure endowed with hierarchical functions that are not necessary characteristics of an "organism" *tout court*.

[8] According to Whitehead's definition, all actual entities are actual occasions of experience, except God. But keeping this exception in mind, one can take both term as synonyms.

[9] Experience refers here to the grasping of a plurality of elements into a new creative unity, and not merely to sense perception. Hence experience does not necessarily require any cognitive or conscious activity, and achieves both only at very high level of complexity.

[10] As David Griffin points out, "the causal influence of the past upon the present is in-fluence, a real in-flowing, which affects the present experience internally" (Griffin 1993, 197).

[11] Whitehead writes: "every particular actual thing lays upon the universe the obligation of conforming to it" (*S* 39).

[12] Griffin suggests considering Whitehead's system as a panexperientialism with *organizational* duality: for while Whitehead does overcome Cartesian dualism, he still differentiates between body and soul, due to their different degrees of freedom and their different organizational structure (Griffin 2001, 6).

[13] Assertions such as "[i]t seems as though a certain similarity were a favourable condition for endurance" (*SMW* 109) brings Whitehead even closer to contemporary work that applies chaos theory to biology and ecology.

[14] *Cf. The Function of Reason*: if survival in the sense of enduring through time were the only aim attained by organisms, then a rock would be a champion in the struggle (5).

[15] A route of entirely living nexus is a "living person."

[16] Life is neither a defining characteristic of a whole society nor can it apply to a single occasion (*AI* 207). Only a nexus can be living or non-living according to the degree of novelty available to it. Accordingly, a whole society can be termed "living" only if among the nexus constituting it are 'regnant' (*PR* 103).

[17] Therefore, life is the necessary condition for the development of a higher degree of mentality (e.g. consciousness) endowed with even more capacity for novelty: "Mental experience is the organ of novelty, the urge beyond" (*FR* 33). While in the lowest forms mental activity is extremely irrelevant and tends to the conformal reproduction of stable order, more complex forms contain "a factor of anarchy" (*FR* 33) that lets novelty emerge.

[18] In living societies, "this interplay takes the form of robbery. […] It is at this point that with life moral acute. The robber requires justification" (*PR* 105).

[19] "The parts of the body are really portions of the environment of the total bodily event, but so related that their mutual aspects, each in the other, are peculiarly effective in modifying the pattern of either. […] Thus the body is a portion of the environment for the part and the part is a portion of the environment for the body" (*SMW* 149)

[20] "The concrete enduring entities are organisms, so that the plan of the *whole* influences the very characters of the various subordinate organisms which enter into it" (*SMW* 79).

[21] "Self-organization processes in far-from-equilibrium conditions correspond to a delicate interplay between chance and necessity, between fluctuations and deterministic laws" (Prigogine and Stengers 1984, 176). *Cf.* Whitehead: "we shall conceive each primordial element as a vibratory ebb and low of an underlying energy, or activity" (*SMW* 35).

[22] The principle of novelty does not emerge all of a sudden at a certain level of complexity without being at all present before. On the contrary, according to Whitehead, novelty, self-realization and a flicker of freedom are present all the way down, even if in a nearly negligible form below the threshold of relevance.

[23] "Event thinking must recognize the existence of relatively enduring 'substantial objects' and undertake to explain them in terms of patterns of interconnectedness among events" (Birch and Cobb 1990, 86).

[24] However, it is important to notice that each actual entity is a value *because* it is the outcome of a process of valuation, which alone can properly explain the advance into novelty. Indeed this process of valuation is describable in terms of experience in the mode of causal efficacy as a taking account of (*SMW* 69): experience is "always valuable" precisely because it is this process of valuation itself, i.e. the grasping of past influences, the (evaluative) selection among them, the (evaluative) consideration of new possibilities charged with value by means of God's envisagement and the final self-realization in a new subjective form.

[25] Whitehead's term "members" suggests more precisely an acknowledgement of their being active self-shaping entities. In a strict sense of the term actual entities are not parts, into which a whole could be divided. This would reproduce the materialistic framework of divisible matter spatially extended.

[26] As David Griffin points out: "We can and should think in terms of degrees of intrinsic value: bacteria have more intrinsic value than molecules, cats have more than bacteria, humans and apes have more than cats" (Griffin 1992, 17).

[27] Palmer asserts that process ethics is a maximizing ethical system, and that "the ultimate aim of ethical behavior is to produce the greatest possible value for the consequent nature of God" (Palmer 1998, 15). She writes: "What matters is the generation of rich experience for God. It is not the source of value which is significant, but the quality and quantity" (1998, 25). For a criticism of Palmer and a more detailed discussion of the topic, see the Forum on PS 2004.

[28] Considering instrumental values as secondary with respect to the moral relevance of intrinsic values leads to the extreme consequence that if we acknowledge moral standing to collective entities like biosphere or ecosystems, we must consider them as endowed with intrinsic value as well. This seems to be counterintuitive, unless we find a definition of intrinsic value different from the concept of being an end in oneself, valuing for oneself, being a valuer. How can an ecosystem "value" itself and for itself? To assert that ecosystems have value independently of human valuation does not necessarily require the attribution of intrinsic value to them, if one develops a complex concept of instrumental value that goes beyond the idea of a mere mean to (human) ends.

[29] Referring to Naess' Deep Ecology, Griffin calls attention to the difference between his use of the term *intrinsic* value and Naess' use of the term *inherent* value. For Griffin intrinsic value is

to be contrasted with the value for others; for Deep Ecologists "the *inherent* value of something […] *stands in contrast solely with its (perceived) value for human beings*" and their purposes (Griffin, 1993, 202). In this narrow understanding, one respects or saves something either for its own sake or for our sake as human beings.

[30] A pencil and the desk on which its lies can be said to have mainly external relations because their reciprocal influence is relatively low, even though not absent.

[31] The latter serves Ferré as an argument against the universal claim of ethical vegetarianism (Ferré 2001, 277).

[32] Howell proposes to assess the value referring not to the consequent nature of God, as Birch and Cobb do, but from the perspective of the primordial nature. This implies that the value of each being does not depend on the actually achieved intensity and richness of experience that is prehended by God in the consequent nature. Rather, in the primordial nature, "God's aim is toward the richest possible experience for each moment. At that moment, each event is related to God as a unique instance of value" (Howell 1988, 86).

[33] "Chaos does not display mere disorder. Rather, it reveals an order in nature too complex to have been understood in terms of modern deterministic materialism. Probabilistic chaos refers to nonlinear patterns of unpredictable, asymmetrical dynamics in nature" (Keller 2001).

Ecofeminism: Women, Nature, Dualism and Process-Relational Philosophy

Carol P. Christ[i]

Rachel Carson whose book *The Silent Spring* (1962),[1] inspired the environmental movement, has been embraced by ecofeminists for her conviction that it is necessary to love the natural world as well as to understand it. According to Carolyn Merchant, author of *The Death of Nature,* the "term *ecofeminisme* was coined by the French writer Francoise d'Eaubonne in 1974 to represent women's potential for bringing about an ecological revolution to ensure human survival on the planet."[2] In her dedication to the ecofeminist anthology *Reweaving the World,* Grace Paley spoke of a "revolutionary understanding we call feminist and ecological, in which we share the world with all creatures and all living things and know their stories as our own."[3] Irene Diamond and Gloria Feman Orenstein define ecofeminism as encompassing "both the diverse range of women's efforts to save the Earth and the transformations of feminism in the West that have resulted from the new view of women and nature."[4] I define ecofeminism as desire and activism based on an alternative worldview in which women and nature are re-valued in a renewed vision of humanity embodied and embedded in the web of life.

Ecofeminism overlaps to a great degree with the spiritual movement known as Goddess feminism, a widespread grassroots movement that re-values women and nature using symbols of Goddesses. Most Goddess feminists are ecofeminists, but not all ecofeminists are Goddess feminists. Starhawk, Charlene Spretnak, Carol P. Christ, Mary Daly, and Alice Walker are Goddess ecofeminists.[5] Carol Adams, Sallie M*cf*ague, and Rosemary Radford Ruether have articulated a Christian ecofeminism, while Lynn Gottlieb has explored Jewish ecofeminism.[6] Secular ecofeminists include Carolyn Merchant, Ynestra King, Petra Kelly, and Grace Paley.[7] Vandana Shiva speaks for growing numbers of women in Africa and Asia whose lives have been negatively affected by Western "maldevelopment" projects.[8]

In the introduction to *Reweaving the World,* Diamond and Orenstein identify two philosophical insights that have inspired ecofeminists. The first is that "the Earth is sacred unto itself, that her forests, rivers, and different creatures have *intrinsic* value." The second is that "because human life is dependent on the Earth, our fates are intertwined." They suggest that these insights come together in "the perspective of indigenous peoples, whose connection to native lands is essential to their being and identity" leading to the conclusion that "it is both true that the Earth has intrinsic value and that we are also dependent on her."[9]

Ecofeminists arrived independently at many elements of the worldview developed by process-relational[10] philosophers Alfred North Whitehead and Charles Hartshorne. From the standpoint

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of ecology, the most important of these is the insight that all individuals including human beings are interdependent in the web of life.

1. Ecofeminism: Roots and Stakes

Many ecofeminists trace the roots of the ecological crisis to habits of dualistic thinking that arose in classical Greece.[11] Platonic dualism separated mind and matter, spirit and nature, soul and body, reason and emotion, changelessness and change. It asserted that mind, spirit, soul, and reason were transcendent and unchanging, while matter, nature, body, and emotion were immanent and changing. It was stated that the rational soul of "man" could rise above the changing world of body and nature in order to commune with timeless and unchanging truth. As feminists noticed, Platonic dualism identified "man" with mind, spirit, soul, reason, and transcendence, while "woman" was identified with matter, nature, body, emotion, and change. Thus it seemed logical that "man" should rule over "woman" and "nature." This view was expressed in Christian and Jewish theologies that proposed that man's true home was not the changing world of body and nature but a transcendent realm called heaven. It was articulated in a different way in the so-called modern scientific worldview which stated that nature was "mere matter" to be shaped by the rational will of technological man. The view that nature was mere matter to be controlled by man was fundamental in the development of both capitalism and socialism.

Modern feminism began with the radical assertion that the "rights of man" should be extended to women.[12] Since the "rights of man" were said to include right to control nature, this "right" could logically be claimed to be woman's as well. Asserting that female intelligence was fully equal to male intelligence, some liberal and socialist feminists argued or assumed that women are just as capable as men of "rising above" the "limitations" of the body and nature and looked to science and technology to "free" women from the "bonds" of motherhood. Others—ecofeminists and Goddess feminists among them—questioned the terms in which the debate had been framed. They asked whether the goal of human life—male or female—should be to rise above the body or to separate from and control nature. In questioning entrenched dualisms, ecofeminists were challenging the foundations of Western thought.

In her ground-breaking visionary ecofeminist prose poem and philosophical treatise *Woman and Nature*,[13] Susan Griffin documents the ways in which woman and nature have been viewed together as "other" to the rational male ego. Arguments for the subordination and control of women and nature by theologians, philosophers, witch-hunters, scientists, and technocrats are couched in chillingly similar language. While agreeing with other feminists that women are as intelligent as men, Griffin asks us to consider what both women and men have lost in denying the human connection to the natural world. She suggests that the notion that man can rise above the body and the natural world is a fiction that can only be maintained by denying his own body and mortality. In the context of denial, man's attitudes toward woman and nature become tinged with fear and anger, producing violence. As Griffin shows, women, defined as closer to nature,

retain a greater sense of their connection to it than men, but at the same time are taught to view their connection to nature as a sign of their inferiority.

In an astonishing reversal, Griffin suggests that women can turn dualistic traditions against themselves, by re-imagining "this earth" as "my sister" in suffering, survival, and resistance.

> This earth is my sister; I love her daily grace, her silent daring, and how loved I am how we admire this strength in each other, all that we have lost, all that we have suffered, all that we know: we are stunned by this beauty, and I do not forget: what she is to me, what I am to her (Griffin 1978, 219).

Griffin's prose becomes a love poem between woman and earth, articulating deep feelings for the earth that women have been taught to suppress because all adults know that the earth is dead matter. Rejecting this, Griffin proposes that women can gain strength by affirming their deep feelings of connection to nature, because nature, like women, is not only victim, but also survivor. Griffin is drawn to images of long-suppressed Goddesses as she searches for words to express her sense of the sacredness of the female body and the earth body, but for the most part hers is a mysticism celebrating the connection of body and earth.

In her words written in prose poetry that evokes experience, Griffin re-embodies and re-configures Western philosophy.

> We know ourselves to be made from this earth. We know this earth is made from our bodies. For we see ourselves. And we are nature. We are nature seeing nature. We are nature with a concept of nature. Nature weeping. Nature speaking of nature to nature (Griffin 1978, 226).

She challenges the clear separation between humanity and nature that has been fundamental in Western thought, writing instead: "we are nature." We might think that these words make no sense, because nature and humans are different things. Or on the other hand, we might think that Griffin is simply repeating the widely held belief that women are less rational and therefore closer to nature than men. But this would be to misread, for she continues, "We are nature seeing nature. We are nature with a concept of nature." Here she is saying that the capacities for scientific (and other forms of) observation and philosophical thinking (and its categories) arise within nature. Yet, she suggests, scientific and philosophical thinking without emotion or feeling are partial, for we are also "Nature weeping." Should we dismiss her words as poetic excess, or should we read them as they are intended: as a serious and embodied philosophical statement?

Griffin and other ecofeminists are sometimes accused of inscribing a "new essentialism" in which women and nature are valued, while men are not. But this is to misread, for ecofeminism understands that men too are part of nature. If nature is made unfit for human life, no man will survive. Thus it is incumbent on men to criticize dualistic traditions from which they have benefited at the cost of denying their emotions, their bodies, and their own connections to nature. Yet even if it is made clear that the ecofeminist view includes men, some would object that ecofeminism presents a "totalizing" (universal or ontological) view that is unwarranted; they might argue that women and men should be free to deny the body if they wish or to choose culture over nature. Ultimately these differences are differences in worldviews, though this is not always recognized. If we really are embodied and interdependent in the web of life, then to

"choose" to ignore our bodies and our connection to nature is to choose alienation and self-destruction.

2. Ecofeminism and Process-Relational Philosophy

I have found process-relational philosophy extremely helpful in the articulation, clarification, and extension of the ecofeminist worldview.[14] All too often ecofeminist ideas are dismissed as misguided, confused, or overly emotional without being fully understood. Process-relational philosophy can help to show that ecofeminist insights cohere in worldview that provides a compelling alternative to traditional and modern Western worldviews. Greater familiarity with ecofeminist work could help process-relational philosophers to recognize the roles played by androcentrism and misogyny in the development of the dualisms at the root of Western philosophies. Understanding this could provide impetus for process-relational philosophers to articulate the feminist implications of their own efforts to transform dualistic thinking. However, for this change to occur, traditional process-relational thinkers also must reflect upon the ways in which the dualism of mind and body, reason and emotion, have affected the (sometimes disembodied, emotionless) form in which process-relational philosophy is written.

From the standpoint of ecology, the most important insights shared by ecofeminists and process-relational philosophers are the following: (1) all individuals are both intelligent and embodied; (2) all individuals are internally related to other individuals; (3) all individuals are interdependent in the web of life; (4) life in a finite and interdependent world is inherently ambiguous and thus there is no guarantee that everything will work out for the best; (5) ethics arise out of the web of life, out of deep feelings of connection to other individuals. Each of these ideas can be found in both ecofeminism and process-relational philosophy. Rather than comparing and contrasting them, I will instead address their shared concerns from the perspective of a synthesis of the two that I call a feminist process-relational paradigm.

All individuals are intelligent and embodied. From a feminist process-relational point of view all individuals in the universe from the smallest particle of an atom to Goddess/God[15] are both intelligent and embodied.[16] This is not to say that the particles of an atom have the same degree of consciousness or awareness as dogs, human beings, or Goddess/God. All individuals are intelligent in the more limited sense of having (in vastly different degrees) the ability to respond to and thus to change their environment. From a feminist process-relational point of view, the world is filled with intelligence, and the evolutionary process is testimony to the intelligence of all the individuals that have co-created the universe as we know it. Consider the ants and anthills. While creationism attributes the creation of anthills to divine plan and modern science attributes it to blind "instinct," a feminist process-relational perspective insists that at some point in time the ancestors of contemporary ants exercised their intelligence and learned to work together to create anthills. Today this ability may be partly or completely encoded in their genes, but at some point, it was not. When we think of all living beings as in some sense intelligent, it is no longer possible to think of intelligence and embodiment or intellect and nature as polar opposites as we have been taught to do since the time of Plato. Intelligence is

found throughout all of nature and in every body. Intelligence is the way bodies relate to each other and co-create the world. If all individuals in the world are intelligent and embodied, then when we must recognize that when we spray a pesticide on an ant colony, we are taking the lives of intelligent beings. As we develop greater respect for other-than-human forms of life, it becomes more and more difficult to treat them as mere means to our ends.

While Whitehead did not speak of the divinity as having a body, Hartshorne (following Plato in the *Timaeus*) boldly insisted that the world is the body of God. This insight is shared by many Goddess ecofeminists who experience the presence of the divine in human and other-than-human bodies and in the earth or cosmos as a whole. The notion that the world is the divine body is often understood in terms of monism. Monism asserts that there is only one real individual in the world—the divinity. All other individuals are simply enactments of a divine drama or dance. Process-relational philosophy rejects this understanding, insisting that the individuals that make up the divine body have real existence. That is to say, human beings, ants, cells, and particles of atoms are real individuals with real choices to make; they are not simply the manifestation of the divine will. How can we be real individuals and part of the divine body? Hartshorne uses the analogy of the human body. Although the human body functions as a unit, it is also made up of discrete individuals. We do not tell the cells in our stomachs how to digest our food, nor do we tell the cells of our blood how to fight infection. The cells of our body exist both as individuals and as parts of a larger whole. It must be something like this with the individuals in the world that make up the body of Goddess/God. Though Hartshorne does not use the metaphor of birth to explicate his understanding of the world as the body of God, I find it appropriate. A child carries aspects of its parents' and other ancestors' genetic code in its DNA and cells from its mother's body in its blood. It is nurtured in its mother's body and is born through it, yet it becomes an individual. Neither is exact but together the analogies of cell to body and child to mother are suggestive of the relation of the world to Goddess/God.

The philosophical concept used to explain the relation of the divinity to the world in process-relational philosophy is panentheism. From *pan,* meaning *all, en*, meaning *in,* and *theos,* referring to divinity, panentheism means that "all" is "in" "Goddess/God." For Whitehead this meant that the divinity relates internally (i.e. in a way that adds to and changes divinity) to the world and every individual in it with perfect understanding, remembering it for ever. Everything in the world enters into the eternal memory of divinity. But if the world is the body of Goddess/God, then panentheism can also be understood to mean that Goddess/God is *in* the world, for all bodies are part of the divine body. As we begin to see the world as the body of Goddess/God, teeming with intelligent life, then we must question western culture's dominant view that nature is mere matter to be manipulated to human ends.

All individuals are internally related to other individuals. We are constituted by our relationships. We are not billiard balls bumping into each other without really affecting each other. Nor are we separate individuals who are best off contemplating God or eternal truths in splendid isolation. We take the other into ourselves and we are changed. This is not to say that we are nothing but the sum of our relationships. We are shaped and changed by every individual with whom we enter into relationship, consciously or unconsciously. Yet we also change every individual who enters into relationship with us consciously or unconsciously. We know that

children's lives are shaped by the love they are given and the cruelty that is visited upon them. But parents too are changed by their children, as every parent knows. Internal relationships are shaped by the dance of give and take and give again. It is sometimes feared that a philosophy that focuses on relationship makes us all into nurturers and thus dependent upon others to give meaning to our lives. But this is to distort the meaning of relationship. If relationship is fundamental, then nurturing is of course fundamental to life, for we all need help to grow and thrive. But to be in relationship is not to be merely passive. Relationship involves both activity and passivity. Not to be active or assertive as well as passive and accepting is not to be fully in relationship.

One of the ways process-relational philosophers explain the internality of relationship is through the notion of sympathy. From *syn* ("with") and *pathos* ("passion"), sympathy is feeling with, or feeling the feelings of others—both joy and sorrow. Because process-relational philosophy understands that we are constituted by internal relationships, it also asserts that we can feel the feelings of others, not exactly as the other person feels their own feelings, but closely enough that it makes sense to say we feel their feelings. Of course there are degrees. But if we recognize all individuals in the world as relational beings, then we must also recognize that we can enter into relationships with them—on different levels, of course. And if we begin to feel the feelings of animals and plants and even minerals,[17] then we will take a very different view when contemplating their destruction.

In a feminist process-relational paradigm, Goddess/God is understood to be the most relational of all relational beings. Whereas our ability to enter into the feelings of others is never complete, Goddess/God feels the feelings of every individual in the universe accurately. Goddess/God is not (only) a passive listener; Goddess/God enters deeply into our lives and by feeling our feelings and thus transforms them. Goddess/God inspires[18] us to enter more deeply into life and relationship, to feel the feelings of as many others as possible, and to live in as much harmony as is possible with all beings in the web of life. Recognizing that the world is co-created in relationship can help us to see how critical the human effort to reverse the humanly-created ecological crisis is.

All individuals are interdependent in the web of life. This follows from the notion that relationships are internal. We really are constituted by our relationships. This is true in a physical sense. We are also constituted by the food we eat. It is not only that we need to eat to live. Though we do not generally think about it, when we eat a vegetable, we not only consume the vegetable itself, but we take in the minerals of the soil and water the vegetable was grown in. If the vegetable was grown near a mountainside, then when I eat it, I am literally eating part of the mountain. If poisonous rain from the nuclear catastrophe at Chernobyl fell on the mountain, I (along with birds and tortoises) may also be eating radioactive particles from Chernobyl.

When we live fully in our bodies and stay in one location long enough to get to know it, we can become connected to place in profound ways. For the Aboriginal Australian people, specific places in the landscape evoke specific songs that tell stories of things that happened in that place. At a particular place an Aboriginal person will sing a special song, but will not necessarily sing it in any other place because the song belongs in the landscape.[19] This suggests

that our bodies do not need to end at the edges of our flesh. When we are connected to place, our bodies expand to include the landscape. And when this is so, there is also a sense in which destruction of a familiar landscape is like cutting off an arm or a leg. If we all allowed the boundaries of our bodies to be extended into the places where we live and the places we love, we would be forced to protest their destruction.

Life is inherently ambiguous and there is no guarantee that everything will turn out for the best. In an interdependent world, life is inherently ambiguous because the world is co-created by all of the individuals in it. There are many different individuals in the world and each is affected by the actions of others. While we sometimes consciously choose the effects we hope to have on our world, most of our actions are unconscious and habitual. Thus we usually do not think about all of the consequences of our actions. Even when our choices are conscious, it is impossible to know their effects on every other individual in our world. When something out of the ordinary happens in our lives, especially unexpected suffering, we are often told by well-meaning friends that "it was meant to be" or that "everything happens for the best." But in fact this could only be true if a single intelligent, good, and omnipotent Creator is responsible for everything that happens in the world. If the world is genuinely co-created by all of the individuals in it and if those individuals act with less than full knowledge of the consequences of their actions, then it is impossible that everything in the world is meant to be or happens for the best. Sometimes we do something knowing that it will harm others. Much of the time we don't think but simply act in habitual ways. Yet even when we do think before we act, it is not possible to know all the consequences of the choices we make. In an interdependent world, harm is done, knowingly and unknowingly. To imagine that all that happens is somehow the will of Goddess/God is to deny that individuals actually do have the capacity to affect, to co-create, the world.

Yet there is great resistance to accepting responsibility for our own power as co-creators of the world. The great appeal of religious fundamentalisms is that they allow us to maintain the belief that someone else is in control. If a good God really is in control of everything that happens and if everything really does happen according to his plan, then we don't have to worry too much about what we are doing. If we go to war, then war must be part of God's plan. If we kill people in war, that too must have been part of divine plan. If we destroy the environment with bombs, that too must have happened for the best. Perhaps all this destruction is leading up to a great conflagration in which the wheat will be separated from the chaff, as Scripture tells us. Yet if we accept our power to co-create and shape the world, then we must also acknowledge our power to destroy life. When we do that, we also recognize the importance of our acts and failures to act

Ethics arise out of deep feelings of connection with other individuals in the web of life. Judaism, Christianity, and Islam tell us that the source of ethics is the command of a God who exists beyond the world. In contrast, feminist process-relational philosophies suggest that the source of ethics can be found within the world. Ethics arise out of deep feelings of connection with other beings in the web of life.[20] This is possible because the nature of existence is profoundly relational and social. When we feel the feelings of others in a profound way, it follows that we wish the best for them: we wish their joy to be increased and their suffering to

be diminished. When we feel the feelings of the greatest number of other individuals as we can, we profoundly desire a world in which each of them and the largest possible number of other individuals can experience the greatest joy and satisfaction.

An ethics grounded in feeling the feelings of others will always be an ethics of ambiguity. Where there is no transcendent source to tell us what to do, we must make decisions ourselves. Yet it is not possible to live in a relational and independent world without doing some harm to others. At minimum, we must eat. We do not have to eat animals, but even if we are vegans, we still must take the lives of plants in order to survive. Most of us also would choose to create some form of shelter against the cold and this too often involves destroying life. Yet we do not really need all of the things our cultures have told us we need. If we learned to take only what we need, we would live in a very different world.[21] Our ethics choices are also ambiguous because it is impossible to foresee all of the consequences of our actions, as discussed above.

Even if we accept that an ethics rooted in deep feelings for all individuals in the web of life must inevitably be ambiguous, we are still left with the problem of explaining why it is that so many of us make so many choices that are inconsistent with feeling the feelings of large numbers of others in a profound way. Why do we continue to consume and pollute even when we know that our so-called prosperity is predicated upon the suffering of others and the pollution of the environment? Are we inherently selfish? I believe that human nature and all of nature is fundamentally relational rather than selfishly individualistic. I agree with Elisabet Sahtouris who in her book *Gaia: Human Journey from Chaos to Cosmos* (1989) proposed that co-operation rather than competition is the fundamental principle of the evolutionary process. Successful species do not, she argued, for the most part succeed by wiping out the competition, but rather by finding ways to co-operate with other species in sharing the resources, that is by finding a symbiotic niche within the web of life. To say that relationality and co-operation are the fundamental building blocks of all life, is to say that human or other beings are not naturally selfish but rather are naturally relational or social. No species would survive if the tendency to care for its own young were not in some sense natural to it. Still, it is a long step from caring for one's own young to caring for all of one's own kind, and a much longer one to caring for all sentient beings. Yet there have been many instances of individuals from one species caring for and nurturing individuals of another. I am thinking of a dog named Tseri who lived in Mochlos, Crete, who happily nursed and groomed abandoned kittens along with her own puppies, as well as of the first human woman who took a motherless animal and nursed it at her own breast. The capacity to care for others not of one's kind is a possibility to be found within the inherently relational and social nature of life.

Still, experience tells us that most individuals are more likely to care for their own offspring and their own kind first and only if they have time or if there is something in it for them to care for others who are not like them. So how do we move from care for those near and dear to us to care for the world? I suggest that we consider the role of symbols in shaping our feelings. It may or may not be natural or necessary for us to extend our capacity to feel the feelings of others from those closest to us to all beings in the web of life, but it is a capacity that exists within the web of life. We can nurture and develop this capacity or cut it off. I believe it is the role of culture and in particular of cultural symbols to select and shape, to encourage or discourage the

capacities that exist within us and within life. The symbol systems of modern cultures celebrate violence, destruction, and domination. We will need different symbol systems if we hope to create a different world.

The five elements of the ecofeminist process-relational worldview that I have discussed here provide a foundation that can ground the environmental ethic needed if we are to preserve and enhance the possibilities of diverse and abundant life on Earth. It is my hope that ecofeminists and process-relational philosophers will learn from each other and will assist each other in transforming their related visions into a shared course of action.

Notes

[1] See also Rachel Carson 1965.

[2] See Irene Diamond and Gloria Orenstein 1990, 100.

[3] Diamond and Orenstein, iii.

[4] Diamond and Orenstein, ix.

[5] See Starhawk 2004; Capra and Spretnak 1984; Christ 1998; Daly 1984; Walker 1991.

[6] See Adams 1994; M*cf*ague 1993; Ruether 1992, 1996; and Gottlieb 1995.

[7] See Merchant, 1980; King 1984; Kelly 1984.

[8] See Shiva, 1988.

[9] Diamond and Orenstein, xi-xii. While a great deal of ink has been spent by ecologists debating whether the value of other-than-human individuals is absolutely intrinsic or whether they are of value because of their contribution either to human life or to the whole web of life, I find it characteristic of ecofeminist thinking to consider the wisdom in embracing both positions. I would not call this "sloppy" thinking but rather would interpret it as a search for a more holistic perspective. In this case, I would argue that all individuals (human and other-than-human) do have intrinsic value *and* that all individuals with intrinsic value must use other individuals with intrinsic value to one degree or another in order to survive. However, when the intrinsic value of "used" individuals is recognized, ethical guidelines such as "take only what you need" and "approach the taking of life with great restraint" (see *Rebirth,* 167-70) are set within a context that encourages doing as little harm to other individuals in the web of life as possible and also within a context in which the possibility of being used as food for other carnivores or of being killed by a volcanic eruption can be understood as part of the give-and-take of the life process.

[10] I am indebted Marjorie Hewitt Suchocki for proposing that process philosophy be renamed process-relational philosophy to call attention to the importance of relationship as well as change in it. In *She Who Changes: Re-imagining the Divine in the World* (2003), I called for a feminist process paradigm; now I prefer to speak of a feminist process-relational paradigm.

[11] See Ruether, 1979.

[12] See Wollstonecraft 1975 [1792].

[13] Found in Griffin, 1978. I focus on *Woman and Nature* not only because it has been influential in shaping ecofeminist philosophy, but also because I view it as the most profound work of the contemporary feminist movement.

[14] In my *She Who Changes*, I show how process-relational philosophy can be used to articulate and expand feminist theological and theological worldviews. I argue that in challenging classical dualisms and in affirming changing life, process-relational philosophies as developed by Whitehead and Hartshorne are implicitly feminist.

[15] "Goddess/God" is the term I use for the divinity in order to stress that that the divinity to which I refer is neither the exclusively male "God" of the monotheistic traditions, nor the transcendent and not immanent "God" of classical theism.

[16] Hartshorne (but not Whitehead) insists that the world is the body of God, as I discuss below.

[17] In process thought, a plant is not an individual but a society of individuals, so our relationship is not with the plant but with the cells of the plant; our relation with minerals such as rocks or mountains is with the atoms and particles of atoms that are found within them. Still, I would argue, such relationships are not only possible but also deeply felt.

[18] Whitehead speaks of the divinity as "luring" us toward greater intensity and fulfillment, while Hartshorne speaks of the divinity as "persuading" us. I prefer to speak of the divinity as "inspiring" us, because of the resonances of "inspiration" with breath, breathing, and energy exchange. I do not see the divinity as setting us a specific goal and luring us to it, nor as rationally persuading us of a certain course of action. It seems to me that the divine influence is always of a general nature, such as "you can do it," "be more loving," "expand your vision,"

etc. I like to think of divine inspiration as a surge of energy when I am overwhelmed and as expanding my vision when I am stuck, as taking a deep breath does.

[19] See Abram 1997, 163-72.

[20] See Christ 1998, 165.

[21] This is a Native American ethical guideline; *cf.* Christ 1998, 167-68.

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V. Economy

Whitehead on Economics

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Alfred North Whitehead did not spend much time in his writing directly addressing economics—either the theory or the actual social effects. But it does come up, especially in *Science and the Modern World* and *Adventures of Ideas*. He often uses economics as an example of how too much deductive theorizing can have untoward effects, yet he also believes that "commerce" is central to the spread of the effective use of persuasion in civilization, as opposed to coercion. These comments help provide clues to Whitehead's views about economics. However, much more important for a critique of capitalist economics is his understanding of the usefulness and limits of deductive method, and his critique of the underlying assumptions on which Neoclassical theory (the theoretical foundation of capitalism) is based. Most useful of all is his ontology, which can provide a new foundation upon which to develop a more adequate economics. A review of what Whitehead did actually write about economics, then, is useful even when it does not go as far as one would wish in directly addressing economic issues. Accordingly, the bulk of this article will examine closely Whitehead's comments about economics, particularly in *Science and the Modern World* and *Adventures of Ideas.* Then we will consider some further implications before presenting the work of Herman Daly and John B. Cobb, Jr. as the most important example of Whitehead's influence on economic thinking.

1. Whiteheadian Economics

1.1. Whitehead's Observations on Economics and Commerce

We will look at *Science and the Modern World*, which Whitehead presented as the Lowell Lectures in 1925, before moving on to *Adventures of Ideas*, first published in 1933. What is probably Whitehead's longest commentary on economics comes in Chapter XIII of *Science and the Modern World*, "Requisites for Social Progress." He begins by observing that the influence of Descartes led to "the assumption of bodies and minds as independent individual substances, each existing in its own right apart from any necessary reference to each other" (*SMW* 194). This idea soon "degenerated into a mechanism entirely valueless" (*SMW* 195). According to

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Whitehead, this was not all bad, because it led to an efficient method for scientific research "within those limited regions which were then best suited for exploration" (*SMW* 195). The problems inherent in this approach became most apparent in the nineteenth century, "when society was undergoing transformation into the manufacturing system" (*SMW* 195). Here, "the bad effects of these doctrines have been very fatal" (*SMW* 195).

There are two reasons given for this. First, this individualism led to understanding ethics as a private matter, leading to a deficient moral outlook that was taken up by "the leaders among the industrialists of that period" (*SMW* 196). Whitehead does not go on to spell this out, but he seems to be referring to the massive suffering caused by the nineteenth-century factory system, particularly as experienced by children; and to the justification of subsistence (and lower) wages and mistreatment of workers by the application of Malthus' Iron Law of population[1] and by Spencer's Social Darwinism. A privatized ethics, which focuses only on the personal behavior of individuals, is blind to social injustice.

The second reason for the fatal effects of Cartesian thought is that it led to the "assumption of the bare valuelessness of mere matter" which in turn was used to justify environmental abuse and to discount the importance of "artistic beauty." At that time urbanization was reaching a stage of rapid development. Here Whitehead gives examples that are not as relevant to us today, but the point is that many cities were filled with tenement blocks with no trees or anything green whatsoever. Too often, such basic amenities as parks and good architecture, so necessary for personal, social and environmental well-being, were left out of development. And where they already existed they were often destroyed.

In this, Whitehead sees two evils, both of which are now embedded in economics (both capitalist and Marxian). The first is "the ignoration of the true relation of each organism to its environment," and the second is "the habit of ignoring the intrinsic worth of the environment which must be allowed its weight in any consideration of final ends" (*SMW* 196). A third problem, which exacerbates the two evils just named, is the result of "the professionalizing of knowledge." This has produced great efficiency in a limited sphere, but also "produces minds in a groove":

> Each profession makes progress, but it is progress in its own groove. Now to be mentally in a groove is to live in contemplating a given set of abstractions. The groove prevents straying across country, and the abstraction abstracts from something to which no further attention is paid. But there is no groove of abstractions which is adequate for the comprehension of human life (*SMW* 197).

At this point, Whitehead goes into an examination of the more general consequences of this kind of professionalism. But we can readily see how it applies to Neoclassical economic theory. The theory is based on a set of abstractions from the complexities of human economic activity, as it must be. Whitehead has no quarrel with this. All theories are. The problem comes in when they are rigidified into dogma and applied beyond the limited sphere where the abstractions hold. Even worse, they are enshrined as "value-free science" now freed from any need to return even once a century to examine whether the basic assumptions still hold.[2] Whitehead returns to this a few pages later, when he gives a modern factory as an example of a complex "organism" which should be apprehended in its completeness: "with its machinery, its community of operatives, its social service to the general population, its dependence upon organizing and

designing genius, its potentialities as a source of wealth to the holders of the stock […]" (*SMW* 200). Whitehead goes on to contrast this holistic approach with the consequences of excessive abstraction in economics:

> It is very arguable that the science of political economy, as studied in the first period after the death of Adam Smith (1790), did more harm than good. It destroyed many economic fallacies, and taught how to think about the economic revolution then in progress. But it riveted on men a certain set of abstractions which were disastrous in their influence on modern mentality. It dehumanised industry. […Modern science] fixes attention on a definite group of abstractions, neglects everything else, and elicits every scrap of information and theory which is relevant to what it has retained. This method is triumphant, provided that the abstractions are judicious. But, however triumphant, the triumph is within limits. The neglect of these limits leads to disastrous oversights (*SMW* 200).

These oversights, according to Whitehead, have led to a "materialistic philosophy" that "directed almost exclusive attention to the aspect of struggle for existence in a fixed environment" (*SMW* 205).

Whitehead does not seem to be aware of the argument of economists that improved productivity is a way out of the struggle because it changes the "fixed" nature of the environment, but he likely would have approved of that aspect of economics. After the litany of nineteenth-century industrial evils, he remarks that the "full conclusion to be drawn from a philosophy of evolution is fortunately of a more balanced character. Successful organisms modify their environment. Those organisms are successful which modify their environments so as to assist each other" (*SMW* 205). He does not reject competition, but insists that it be balanced with cooperation, and gives as an example the contrast between a single tree trying to survive on its own, and the intricacy of mutual flourishing that takes place in the Brazilian rain forest (*SMW* 206), where competition and cooperation are in balance. And he never forgets to return to the necessity of re-examining theoretical assumptions and changing them as knowledge and circumstances change. That aspect of Neoclassical economic theory that celebrates itself as "value-free" science would appall him.

We see this concern with the relation of competition and cooperation continued in *Adventures of Ideas* (1933). He states that "the problem of social life is the problem of the coordination of activities, including the limits of such coordination" (*AI* 28). He goes on later to assert that "in the immediate present, economic organization constitutes the most massive problem of human relationships" (*AI 62*). This is as close as he comes to acknowledging the Great Depression, which he does not mention. In a survey of Western history, he points out that slavery was finally abolished while at the same time such ideas as Malthus' law of population were providing excuses for neglecting the plight of masses of people. Working to counter this, according to Whitehead, were the Wesleyans[3] promoting the "brotherhood of man." So industrialization and economics developed in a swirl of social change and counter-pressures, but the age was clearly dominated by the focus on competition, which seemed to exist "wherever men looked" (*AI* 31). The response to this, worked out by Adam Smith and other liberal thinkers, was to assert a faith that "the strife of individuals issued in the progressive realization of a harmonious society (*AI* 33). This seemed to make it possible to continue to affirm "the brotherhood of man" while unleashing "relentless competition with all individual men" (*AI* 33). The problem was that it did

not work well. According to Whitehead, "after two generations of such industrial development, the widespread misery […] aroused the public conscience" (*AI* 33). Something very like "industrial slavery" had been produced.

In response to this manifest failure of "the pure doctrine of nineteenth-century liberalism" (which came to be called *laissez-faire* economics, and ironically is now championed by those calling themselves "conservatives"), England moved to admitting the "necessity for coordination and the failure of free competition" (*AI* 35). Whitehead concludes that "no one now holds [in 1932] that, apart from some further directive agency, mere individualistic competition, of itself and by its own self-righting character, will produce a satisfactory society" (*AI* 35). He notes that various ways of doing the "coordination" have been tried and are still fiercely debated, but that is as far as he goes. Nevertheless, based on his views thus far stated, it seems clear that Whitehead would favor seeking out a "balance" of competition and cooperation in an economy, and thus might prefer a "mixed" economy to the extremes of *laissez-faire* free markets with no government coordination and regulation, on the one hand, and central control of the economy by either government or monopolistic corporations, on the other. We can see hints of this latter view in his chapter on Freedom.

In that chapter, Whitehead makes some comments about the doctrine of "person" that are relevant to economic issues, though, once again, he does not develop their implications. He thinks that one of the reasons the individualistic liberalism of the nineteenth century, which worked for "the trading middle classes" (*AI* 62), works no longer, is the introduction of the idea that a corporation can be a legal "person" with limited liability. According to Whitehead, "the introduction into the arena of this new type of 'person' has considerably modified the effective meaning of the characteristic liberal doctrine of contractual freedom" (*AI* 62). This makes private property a legal fiction, and plays havoc with concepts of individual rights. The whole idea that social relations are merely contractual, therefore only consciously entered into, is, as far as Whitehead is concerned, nonsense: "The human being is inseparable from its environment […]" (*AI* 63).

What Whitehead calls "custom," or the whole inherited complex of social relations, is far more important. Personal freedom is an aspect of this social context: "The environment which the occasion inherits is immanent in it, and conversely it is immanent in the environment which it helps to transmit" (*AI* 63). This embedded character of human individuals is the main reason that unemployment is not only a question of social justice, but is actually a denial of individual freedom. Human beings cannot develop their very individuality apart from a social context. What would Mozart be without an audience to nurture and encourage his vast talent? Whitehead writes: "The essence of freedom is the practicability of purpose. […] Prometheus did not bring to mankind freedom of the press. He procured fire, which obediently to human purpose cooks and gives warmth" (*AI* 66). Because of this embeddedness of individuals, neither the *laissez-faire* ideology that assumes individuals should be left "free" to do what they want with their money, nor social equity policies that substitute cash welfare payments for meaningful participation in society (thus leaving millions dependent on welfare and denied any meaningful role), are adequate. Both are examples of extremely individualistic thinking without regard to the role of social context in individuality.

At the same time that individual freedom requires a social context for its exercise, so too does the larger society need individuals contributing their unique gifts. Given that "there are many types of character" (*AI* 67), "one general end is that these variously coordinated groups should contribute to the complex pattern of community life, each in virtue of its own peculiarity. In this way individuality gains the effectiveness which issues from coordination, and freedom obtains power necessary for its perfection" (*AI* 67). While Whitehead does not go beyond this, it is interesting to think about more recent developments in business with this view in mind. For example, in the early part of the twentieth century industrial production was "rationalized" by reducing the process to an assembly-line of mindless steps (known as "Taylorism"), very much in keeping with the assumption that the world is made up of individual parts, all alike, and all interchangeable—including human beings. In the latter part of the same century, a shift began that is organizing workers into teams in which each member brings unique elements to the whole, including expertise in different fields and individual talents. This illustrates, I think, the sort of thinking, and acting, that Whitehead was already advocating when Taylorism was at its height.

The next chapter, "From Force to Persuasion," is where Whitehead brings up commerce as a positive illustration of how civilizations learn to use persuasion, rather than coercive force, for the good of all. Again, Whitehead makes some observations that give some indication of his views about economics, but does not develop them. He gives a wide definition of commerce, as involving "every species of interchange which proceeds by way of mutual persuasion" (*AI* 70). (This makes one wonder if he would consider wages that rely on the need of people for work and a lack of other options, really part of "commerce," since they have a coercive character.) However, despite the broad definition, Whitehead is careful to ground the discussion of commerce in actual economic activity. He is well aware of the psychological aspects of economic interchange and how that affects "value" in business, noting that the value of gold currency is entirely subjective: "so long as the generality of mankind deem gold to be wealth, then it is wealth; and as soon as this opinion passes, gold then becomes a metal of subsidiary importance" (*AI* 71). This understanding of the psychology of value does not mean, however, that there is no actual physical dimension to value. He claims that demand "may be closely connected with some physical necessity arising out of possession or deprivation, for example, the satisfaction of hunger or starvation" (*AI* 70). Whitehead seems to think that the subjective aspect of value does not come into play until and unless "there is a complete absence of any such physical necessity […] so that the sole advantages of possession depend on the possibility of renewed exchange" (*AI* 70). This would seem to provide a basis for considering value in economics at different levels: one level deals with basic needs, while the other comes into play when there really is a genuinely "free" market for exchange where the coercion that comes from physical need is not a factor. At present, economic theory does not allow for this idea of various kinds and levels of "value." Value is always taken as completely individual and subjective—whatever an individual decides it is. This makes it impossible to assert, for instance, that the desire of a starving person to have something to eat is more important than the desire of a wealthy person to have steak instead of chicken. All desires are equal in economics.[4]

After considering these issues in value, Whitehead concludes:

> The upshot of all these considerations is that the doctrines of Commerce have to be founded upon assumptions concerning necessities, habits, technology, and prevalent knowledge. But habits, technology, and knowledge are variable from epoch to epoch, and even in any one epoch differ in different sections of humanity (*AI* 71-72).

Whitehead criticizes the classical political economy of the nineteenth century for being limited to the aspirations of the middle classes of Northern Europe. He was not writing about the fully-developed Neoclassical economic theory of the twentieth century. Nevertheless, he did anticipate it when he goes on to assert that the preoccupation of the middle classes with "commercial activity as the main occupation of perfected civilization" (*AI* 72) did lead to "the consideration of economic laws which *should* hold, and to the neglect of economic procedures which in fact *did* hold" (*AI* 72). He is criticizing the choice to develop a deductive theory of economics that would insist on limiting attention to economic considerations, to the exclusion of all other issues. He correctly thinks that this was done for the sake of clarity and simplicity, and at this point he makes one of his famous statements:

> In the study of ideas, it is necessary to remember, that insistence on hard-headed clarity issues from sentimental feeling, as it were a mist, cloaking the perplexities of fact. Insistence on clarity at all costs is based on sheer superstition as to the mode in which human intelligence functions. Our reasonings grasp at straws for premises and float on gossamers for deductions (*AI* 72).

Whether Whitehead had read Alfred Marshall, the great synthesizer of Neoclassical "clarity," or not, he certainly was aware that economists at least since John Stuart Mill[5] had been working to develop an increasingly abstract and deductive economic theory that could be less and less concerned with "the perplexities of fact." As we have already seen, this is dangerous, in Whitehead's view, because it leads to the neglect of important dimensions of society, such as the effects of economic activity on the environment. When economic theories (including Marxism) were developed, the main concern was figuring out how to organize society to maximize the production of goods. Hence, that became the driving goal of economics—accepted even by Marx, who, unlike others of his time, understood very well that the environmental affects of unlimited industrial economic growth would be extreme (e.g. Marx 1906 554-555).

The second area that Whitehead criticizes in the political economy of the nineteenth century is the way the Malthusian Law of Population was used to justify exploitation. Economists thought that geometric population growth would always outrun arithmetic economic development, and consequently the labor pool would always be forced to work for bare subsistence. The fact that some businessmen, most famously the nineteenth-century factory owner Robert Owen, could and did make a good profit with fair wages and labor practices, was ignored. It was even the case, as Whitehead notes, that factories "managed on fanciful humanitarian lines" were driven out of business by those who opposed the use of fair labor practices (*AI* 73).

In this area Whitehead does agree with the development in economics of the understanding that productivity increases can make it possible for a growing population to coincide with a growing standard of living: "History has only disclosed three ways of escape—expanding Commerce, improving Technology, and utilization of Empty Regions. […] In the wide sense of the term, Commerce covers all three conditions. […] The central factor is Commerce; and more

than that, it is Commerce developed adventurously" (*AI* 77). Whitehead agrees with Neoclassical theory in seeing nature as "plastic;" furthermore, he asserts that human beings are "that factor *in* Nature which exhibits in its most intense form the plasticity of nature" (*AI* 78). So economic growth and development that utilize non-coercive Commerce and Technology are a great boon to civilization, in Whitehead's view.

But notice the caveats: he assumes (and would insist) that Commerce is non-coercive. And he firmly and consistently places humankind *in* Nature, not above and apart from it. Insofar as economic practices operate coercively, as when traditional peoples are forced to lose their lands and go to "work" in the cities, they are wrong and should be changed. The same is true for economic practices that ignore the inherent embeddedness *in* and dependence of human beings on the rest of nature to live, so that nonsustainable and environmentally damaging practices are justified as necessary for "jobs" and economic "growth." These failures of economics are not just wrong; they endanger the Earth and everything in it, including human life. Given these views on the plasticity of nature and human embeddedness in it, Whitehead might agree with the proposition that we should affirm the genius of capitalism in overcoming the perceived limits to nature, but—and this is a very important "but"—we must learn how to *move* those boundaries (by finding sustainable and non-polluting sources of energy, for example), rather than crossing them by destroying species, using up resources non-sustainably, and disrupting crucial natural cycles (see e.g. Johnston 1998 114).

Whitehead would applaud the element of mainstream capitalist economics that allows for what he calls "adventure" and creativity; in fact, he would likely see that as the best feature of free markets. And he would certainly insist that any improved economics must take this into account, because he sees this as a basic human need. The "intrinsic energies" of cultures are sustained by "physical and spiritual adventure" (*AI* 82). One of the most important failures of Marxian economies has been the squeezing out of creativity by centralized control. So one of the most important challenges for an economics that is sustainable and just is that it not fall prey to the same problem, but figure out how to retain the creativity unleashed in capitalism and direct it to more socially responsible, sustainable ends.

While stressing creativity and adventure, Whitehead at the same time points to the underlying necessity of "routine" as the basis that makes creative advance possible:

> Routine is the god of every social system; it is the seventh heaven of business, the essential component in the success of every factory, the ideal of every statesman. […] When the routine is perfect, understanding can be eliminated (*AI* 90).

This is the reason that Taylorism was so effective in its day—and, indeed, at the time that Whitehead was writing these sentences. Faced with floods of immigrant labor in American factories speaking a diversity of languages, Taylorism was a way to rationalize factory production to eliminate "understanding" and make it easy for anyone to do the needed tasks. It was a leap from highly skilled but labor-intensive, slow and expensive hand-work to completely unskilled, fast and cheap assembly-line production. The problem was that the work became *too* routine; in fact, it was mind-numbingly boring. In recent decades manufacturers have been learning how to balance routine with more input from workers—more allowance for enough creativity to make the work interesting and therefore allowing for gains in productivity brought by enlisting practical intelligence. Whitehead appreciates both routine and creativity, each in its

right balance. Without routine, the wheel has to be re-invented every day. With too much routine, nothing is invented at all, and society stagnates.

Interestingly, Whitehead thinks that most people of his day are still conditioned to think in terms of a background of social stability, while change is accelerating all around them. He thinks that this "assumption subtly pervades the premises of political economy, and has permitted it to confine attention to a simplified edition of human nature" (*AI* 93). As happens frustratingly often, he does not elaborate the point, but I would venture to guess that he has in mind John Stuart Mill's *homo economicus* (which he does refer to here), and perhaps also Adam Smith's assumption that it is safe to allow individuals to act in their own wealth-maximizing self-interest in the market, because the social context is intact and ensures that they do not act against the interests of their own larger societies. It can certainly be argued that both capitalism and Marxism actually erode this social context. In many nations in the "globalized" economy, there is now less and less social cohesion to prevent self-interested "utility maximizing" from going against the common good of the society.

Whitehead goes on to remark that the "law" of supply and demand, developed in terms of a stable society, provides for "healthy competition" and "is beautifully simple and with proper elaboration is obviously true" (*AI* 94). But Whitehead believes that society was now changing so fast that the basic premises of this way of thinking about economics needed to be changed in light of changing circumstances. Unfortunately, once again he does not elaborate. But he does insist that what is needed is not a new set of "laws" so much as a different mentality: "an unspecified aptitude for eliciting generalizations from particulars and for seeing the divergent illustration of generalities in diverse circumstances" (*AI* 97). In other words, a fully elaborated "model" that can then be applied without further recourse to actual effects will not be adequate. Rather, what is needed is an inductive method that can elicit useful generalities from a constantly shifting welter of events. In a context of constant change and the irruption of unpredictable creativity, it is not safe to base decisions on seeming "trends" in past events; rather Whitehead calls for "forecasting" that is more sensitive to the possibilities emerging from novelties. Who would have predicted the economic impact of computers thirty years ago? It is the quite unexpected uses of inventions that are having the most economic impact now, not the predictable uses of the past. Nevertheless, there must be a balance. According to Whitehead, the business manager of the future would need both the ability to manage routine, *and* "a philosophic power of understanding the complex flux of the varieties of human societies […] such instinctive grasp of the relevant features of social currents is of supreme importance" (*AI* 97).

Finally, Whitehead insists that "the motive of success is not enough," because it "produces a short-sighted world which destroys the sources of its own prosperity" (*AI* 98). Whitehead blames the cycles of economic depressions on this "disease of short-sighted motives." Since the larger community depends on business, it is important that business people have a larger view of their function than profit: "A great society is a society in which its men of business think greatly of their functions (*AI* 98)." This is fundamental to civilization, because every epoch "has its character determined by the way its populations react to the material events which they encounter" (*AI* 99). These reactions are shaped by basic beliefs. Consequently, philosophy has

as much to do with economics as with social character, and is much too important to be left to "irritable professors" (*AI* 98). Business, economics—and the character of civilization itself—all need and indeed are shaped by "those fundamental beliefs" that philosophy must attempt to clarify.

1.2. Underlying "Laws of Nature"

It is in his attention to the underlying "laws of nature" that Whitehead is most useful for those interested in rethinking economics and economic theory. In *Adventures of Ideas* Whitehead devotes a whole section, entitled "Cosmology," to this endeavor. He develops these most fully in his masterwork of metaphysics, *Process and Reality*. But a review of the basics set out in "Cosmology" is sufficient here.

First, Whitehead draws on twentieth-century physics, especially the conclusions of quantum physics, to reconceive the basis on which "laws" of nature can be determined. Physics shows that everything is related to everything else, and that "laws" are based on patterns in those relations that emerge from them. This means that as the patterns of relations change, the "laws" change (*AI* 112). This is quite different from the viewpoint of Newtonian mechanics (and the Cartesian philosophy) and generally presupposed by economics, that self-existent entities are only related externally and non-essentially, rather than internally and inherently. It is also assumed that "laws," once "discovered," can be enshrined in the theory and henceforth depended on to stay the same. So, for example, since Newtonian physics was based on the belief that the world is made up of self-existent individuals, this belief, since "scientific," was taken up in economics and enshrined at the center of capitalist economics systems. Then economics was widely proclaimed to be scientific and "value-free," thereby ignoring its implicit commitment to self-existent individuality above all aspects of human life. Similarly, Newtonian mechanics was enshrined as the foundation of the economic theory with no further revisions, and in the process the revolution that science itself has undergone with respect to these very so-called foundations was ignored.

Second, we have already seen how Whitehead repeatedly criticizes the deductive method that abstracts too much from actual events and then ignores changing contexts. In one passage, he calls this the "Dogmatic Fallacy":

> The error consists in the persuasion that we are capable of producing notions which are adequately defined in respect to the complexity of relationship required for their illustration in the real world (*AI* 145).

One area he thinks is particularly prone to this fallacy is Political Economy, in which "there is hardly a question to be asked which should not be fenced round with qualifications as to how much, and as to what pattern of circumstances" (*AI* 153). The use of mathematics, he thinks, "is too narrow" because "the essential connectedness of things can never be safely omitted" (*AI* 153). He seems to be aware that using mathematics in areas like economics can provide a "sharp tool," as economist Alfred Marshall called it, but what it cuts may too easily go wrong. One reason is that what works perfectly in one context, when shifted to another, may be all wrong. Whitehead remarks that "all science suffers from the vice that it may be combining various propositions which tacitly presuppose inconsistent backgrounds" (*AI* 154). It is important to keep reminding ourselves that Whitehead does not object to using deductive methods and

mathematics: he is only constantly reminding us that the basic assumptions and context much be repeatedly re-tested. In fact, he is more aware than most that "mentality is an agent of simplification" (*AI* 213) and all theory has to be based on high levels of abstraction: "every method is a happy simplification" (*AI* 221). What is crucial is "noting its scope of useful application and its failure beyond that scope" (*AI* 221).

Whitehead was right to worry about this. In the actual development of both capitalist and Marxian models of economics, their social policy advocates were (and in capitalism still are) far more interested in implementing the model as already elaborated than in adjusting and re-thinking the model as circumstances change. The price for this has been high in both economic systems. Where societies have refused to modify the pragmatic working of the economic theory to fit social needs and changing circumstances, the economies have failed or the societies have experienced violent and costly revolutions. It is widely acknowledged that capitalism survived the excessive exploitation brought on by zealous implementation of the economic theory in its most individualistic form only where social policies were modified to mitigate its worst effects on the working masses. The same is true of Marxism, which has failed all over the world, and still hangs on in China mostly because the Chinese government has abandoned the disastrous attempt to implement purely Marxian economic theory. The Marxian ideologues who still believe that Marxian economics should be implemented are now few and quite discredited, but there are still many capitalist ideologues who retain a blind faith in pure *laissez-faire economics*.

1.3. Adventure

Before we finish this survey of Whitehead's explicit statements on economics in *Adventures of Ideas*, we need to say a word about his category of "Adventure." Because reality is essentially always "becoming," change is inevitable. There can be no static perfection, only many "perfections" that are realized and then pass away. Civilizations must pursue the perfections that are possible to them, or stagnate. But the perfections, once achieved, do inevitably pass. When civilizations pass, there can be varying periods of chaos. Interestingly, Whitehead believes that it is possible to have "quick transitions," but only when "thought has run ahead of realization" (*AI* 278). Through "adventures of the imagination," it is possible to prepare for a new civilization and help it to happen: "The world dreams of things to come, and then in due season arouses itself to their realization" (*AI* 279). We can only hope that by working to develop a more adequate economic theory, we can contribute to such a new civilization—one that is sustainable and just, and better exemplifies what Whitehead calls the five qualities of civilization, Truth, Beauty, Adventure, Art, and Peace (*AI* 274).

Unfortunately, despite the pragmatic changes that have taken place with actual economies, the theoretical work of re-examining and re-thinking economic theories in light of the changing understandings of the world and of human nature, that took place in the twentieth century, has barely begun. And the constructive work of transforming our actual societies to move in the direction of more sustainable, more just, and more participatory economies, is in urgent need of this theoretical work. The good news is that this really is an adventure worthy of our best energies and imaginations, and that more people are discovering the satisfaction that comes from working for these changes.

2. Rethinking Economics

In response to the looming environmental and social crises—crises exacerbated by both capitalist and Marxian economic policies—the work of rethinking economics is indeed being done, and "thought" is running "ahead of implementation" in the hope that when societies are ready to change, the needed thinking will already be in place. To date, the most important theoretical work in the tradition of Whitehead has been that of Herman E. Daly and John B. Cobb, Jr., and, most notably, their 1989 book, *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future.* Another book that was strongly influenced by Whitehead is my *The Wealth or Health of Nations: Transforming Capitalism from Within* (1998). For the most part, economists have shown little interest in either feminism or ecology, and even less in Whitehead. But there is also some evidence that this is changing, in some circles. For instance, Julie Nelson is one U.S. economist who has been influenced both by Whitehead and feminist analysis; she has contributed an article to this volume.

Although the book by Cobb and Daly was published first, the *Wealth or Health of Nations* is more historical and has less-developed proposals for a new economic theory. Hence, I will summarize it first.

Economic theories, both capitalist and Marxian, have been developed in a long historical process that really began with the seventeenth-century French Physiocrats and with the work of Adam Smith in the eighteenth century. Along the way, a number of crucial value choices and assumptions were embedded in the theories that have become dominant. In the process of refining and sharpening the deductive power of the theories, some crucial aspects of reality got lost, ultimately with severe repercussions. To summarize, the central goal of both capitalist and Marxist economic policies was growth in the production of goods, to the exclusion of all other considerations. This brought rampant industrialization in both systems; the cost to families, communities, and the environment were all but ignored. Furthermore, economists have always asserted that there are three factors of production—land, labor, and capital. The Physiocrats emphasized the importance of land as foundational to the support of labor and capital, but John Locke's argument for the labor theory of value, and some contemporary political issues persuaded Adam Smith to shift the emphasis to labor as the main source of value. Marx too developed the labor theory to the exclusion of both land and capital. The political economists who developed capitalism gradually shifted to emphasize capital—treating both land and labor as different forms of capital. Consequently, in both capitalism and Marxism, "land" as a unique factor with unique issues, was swept aside, at great cost to the environment. In addition, both economies have also ignored human communities, and dealt with human beings as interchangeable individuals who can be moved around to suit the needs of industrialization—or in the present, globalization—without regard to the consequences to families and communities, which are defined out of consideration.

There can be no denying that Capitalism has achieved its goal supremely well: sustained growth in the production of economic goods is now taken for granted. However, while many Western nations have learned to manage the costs well enough to sustain their populations, the

problems keep mounting. Human and natural communities continue to pay a high price for the largely unrestrained use of natural and human resources needed to sustain high levels of economic growth in production. These problems are a by-product built into the way capitalism is structured, and will not be solved until and unless there is a thorough re-structuring, from basic theoretical assumptions to the actual implementation of better policies. In the last chapter, I offer a Whiteheadian approach to some fundamental aspects of such a re-structuring.

First and most importantly, economics should recur to the proposal of economist Alfred Marshall that the goal of economics should be increase in the production of "health" rather than of "wealth" (1925, 139). Rather than building an economic theory around John Stuart Mill's *homo economicus*, we need to build one around *homo salutaris*—the healthy person. Healthy human beings need healthy families, communities, and ecosystems to sustain them, and they also need healthy, meaningful ways to contribute their individual gifts to others. Daly and Cobb discuss this at much more length, describing human beings as "persons-in-community." A second proposal of Alfred Marshall was to acknowledge the unique aspects of each of the three factors of production and find better ways to take these into account. This would make it easier to pay more attention to the consequences of economic policies on human and natural communities—and stop treating them as if they are "extra" and "external" issues that someone else (not economists and economic policy-makers) can deal with. Behind these recommendations is a Whiteheadian ontology rather than a Newtonian one: every entity is internally related to every other, so that individuality arises out of and contributes to a relational context; and, consequently, every entity has some degree of intrinsic value that must not be discounted. Most importantly, no theory is final or "value-free," but must be re-examined frequently and re-framed as circumstances change.

Now we can turn to the book by Herman E. Daly and John B. Cobb, Jr., *For the Common Good: Redirecting the Economy Toward Community, the Environment, and a Sustainable Future.* Much more extensive than *The Wealth or Health of Nations*, this work includes a thorough critique of economics as a discipline and suggests foundations for a new economic theory, an extensive section on specific policy issues, and ideas about how to move from capitalism to an economy that will be more just and sustainable. John Cobb is a well-known process theologian well-versed in Whitehead. Herman Daly is an economist who pioneered an ecologically responsible economic theory, which he calls "steady-state economics." Both have found an audience for their proposals, and even had some attention paid by the World Bank, though it is too soon to know what the long-term influence of the work will be.

Like *The Wealth or Health of Nations* (which I was writing as a student of Cobb, at the same time that Daly and Cobb were collaborating on *For the Common Good*), Daly and Cobb use Whitehead's critique of the misuse of deductive method and "the fallacy of misplaced concreteness" to detail its economic consequences with respect to such areas as the market, measures of economic success like GNP (Gross National Product), the extreme individualism of *homo economicus*, and the disappearance of any consideration for "land" as a unique factor of production. Then they offer ideas to promote the development of a new economics. They begin with the need to shift intellectual work from the confines of academic disciplines, which have become too narrow, too isolated from real-world issues and from the insights of other

disciplines, and which do not examine their own foundations once established—which has been the biggest problem with economics. They propose to reorganize intellectual work around real social problems instead, going beyond even interdisciplinary work to critique basic assumptions as well as share insights. They propose that emphasis be shifted from short-term profit maximizing to *oikonomia*, the management of the "household" (the Earth) for the long-term good of the whole. This will require a host of changes in thinking, including shifting from individualism to human beings as "persons-in-community," from the "cosmopolitanism" of globalization to "communities-of-communities" which manage their economies to be as self-sufficient as possible and fully sustainable, and in which trade is truly "free"—i.e. entered into freely after basic needs at the local level have been met.

Having laid the foundations for a sustainable, ecological, and more just economics, Daly and Cobb give suggestions for applying these ideas in the policy areas of global trade, population, land use, agriculture, industry, labor, income policies and taxes, and national security. The book ends with a discussion of the constructive role of the religious vision, and an appendix about how an "Index for Sustainable Economic Welfare" might replace the currently used GNP.

Adam Smith, discontented with the monopolistic economics of his day, set out to think his way through to a more adequate way of conceiving and then advocating for a political economy. His suggestions, coherent and timely, succeeded beyond his wildest dreams, and today drive the global economy. But they would not have done so if they had not been recognized as potentially effective, and further developed by generations of thinkers in political economy and practicioners and policy makers in actual economic life. Alfred North Whitehead, in his turn, worked out a way of thinking about the world and how it works that is potentially as likely as Smith's work to change the world. It is incumbent upon us—those of us who believe that the need for better thinking about how to achieve a more just and more sustainable and healthier world for all can be built on the work of Whitehead—to move the work forward. If they could do it in their day, we can do our part in ours.

Notes

[1] Thomas Malthus argued in the early 1800s that it would be impossible to pay more than subsistence wages to factory laborers, because population always grows exponentially while the economy and agriculture only grow arithmetically. Hence there will always be too many laborers clamoring for too few jobs and too little food.

[2] For the classic example of such a refusal, see the essay by Lionel Robbins, "The Nature and Significance of Economic Science" (1984); it was first published in England in 1935 and recognized immediately as a classic defense of deductive economic theory. Robbins sneers at all requests for economists to reexamine basic assumptions in the light of new knowledge and changing understandings of human nature.

[3] This religious reform movement, begun in the 1700s by John Wesley in England, became famous for its concern for factory laborers and their families.

[4] For the classic argument in favor of radical individualism in values, see the essay by Nobel-prize winning economist Kenneth Arrow, "Social Choice and Justice" (1983). The foundational assumption of capitalist economics, that individual choices in the market are the only admissible "good," makes it impossible to argue for a "common good" or that some needs take priority over "wants" in the market.

[5] See Mill's essay "On the Definition and Method of Political Economy" (1984, originally published in 1836) for the first great attempt to articulate economics on the basis of deductive assumptions about how it "should" be, and to deliberately leave out all other considerations for the sake of clarity and effectiveness.

Addendum: Further Commentary on the Work of Economist Herman Daly

John B. Cobb, Jr.[i]

Whitehead's thought has played no role in mainstream economic thinking. Indeed, the one major economist who has adopted it, Herman E. Daly, has been virtually ostracized from the guild of economists, at least in the United States. However, he has had a following in other circles, particularly ecologists and religious communities. He is in great demand all over the world among those critical of the dominant direction in which the global economy is going. He is called on for teach-ins at meetings of the anti-globalization movement.

Furthermore, government officials who have responsibilities both toward the environment and toward the economy are often interested in what he has to say. And even some professional economists working on issues involving natural resources, for example, in schools of forestry, have turned to him for guidance. These officials, economists and others, who recognize the importance of taking the environment into account in economic theory and practice, now have their own organization, the International Society for Ecological Economics. Although the members of the society have diverse views, its organization was stimulated by Daly's work, and he has continued to be a major influence within it. He is co-founder and associate editor of its journal, *Ecological Economics*. There are also national societies in which Daly is held in high esteem; this is certainly true of the Canadian society. Accordingly, one can say that, through him, a Whiteheadian economics is playing a role in the global drama.

Daly studied economics at Vanderbilt University and then taught at Louisiana State University. At Vanderbilt he was influenced by economist Nicholas Georgescu-Roegen who emphasized the biophysical foundations of economics, especially the entropy law. It was through this polymath professor that Daly was first introduced to Whitehead, a connection later much strengthened by collaboration with John B. Cobb, Jr. When the World Bank succumbed to pressure to institute environmental impact studies of its proposed projects, Daly was its most visible choice. Daly's prior experience in Latin America made him acceptable to that division of the Bank in spite of his unorthodox economic views. Since leaving the World Bank, Daly has taught at the School of Public Policy at the University of Maryland. Among his books are *Steady-State Economics* (1977, 1991), *Valuing the Earth* (1993), *Beyond Growth* (1996), and *Ecological Economics and the Ecology of Economics* (1999).

Daly has received considerable recognition for his work, especially in Europe. He was honored with a Right Livelihood Award by Sweden. The Royal Netherlands Academy of Arts and Sciences gave him its Heineken Prize for Environmental Science. He received the Sophie Prize from Norway. Subsequently he received the Leontief Prize for Contributions to Economic

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Thought (Tufts University), and the Medal of the Presidency of the Italian Republic. Thus, Daly has not been ignored at all, except by the professional mainstream of economists. Perhaps this disjunction is an implicit expression of diminishing confidence in mainstream economics.

Daly was clear from an early stage that the human economy should be understood to operate within the natural economy. Since the natural economy is relatively fixed, this means that the human economy cannot continue to grow indefinitely in its use of natural resources. Unfortunately, the now dominant economic thinking is based on the assumption that economic growth can go on indefinitely; the natural world figures trivially, at best, in its calculations. Accordingly, the managers of the actual economy aim at maximizing this growth. The goal of growth justifies policies that work against equity in human relations; these policies have also proved disastrous for the natural environment.

That the human economy is part of a larger natural system that sets limits to human consumption is a fact difficult for most economists to recognize. They are schooled to believe that natural resources are infinitely substitutable, and that technology can, therefore, solve all problems of shortages. They understand nature simply as resource for human use, with no value in itself. Although most of them do not articulate their assumptions philosophically, they may clearly be classified as dualistic and anthropocentric. Daly joined Whitehead in rejecting these philosophical assumptions. He taught, following the philosopher and classical economist John Stuart Mill, that the goal is a steady-state, or stationary-state, economy, operating within the limits of nature and allowing for much of nature to function for the sake of other creatures.

Daly has also been concerned about dominant economic assumptions concerning the human being. Most economists assert that desire is constitutive of value: that is, if a person desires X, then X is valuable. Indeed, value is generally equated with monetary value: X is valuable to the extent that people are willing to pay for it. In accord with this individualistic view is the assertion that no group of people should impose its values on others; it is not for economists or political leaders to say that some objects of desire are better than others. The market should be left to make the decisions as to which goods are available for consumption.

Daly formulates matters differently. People desire many things that are not good for them. Society has some collective wisdom that can be employed to persuade and educate and otherwise influence the use of economic resources. In this, too, his views correspond to those of Whitehead and his followers, who find varying degrees of intrinsic value in all experiences, human and nonhuman alike. They, accordingly, do not identify value with price. They judge that it is important to evaluate actions as to whether they increase or decrease real value in the world. Economics should serve the long-term good of the earth with its human and nonhuman inhabitants, not simply provide ephemeral pleasures for those who can afford them.

Daly quickly recognized his affinities with Whitehead. He made explicit use especially of Whitehead's fallacy of misplaced concreteness. Whitehead saw that the human ability to abstract is a great gift; we cannot think without abstractions. But he saw also that when the abstractness of concepts is ignored, the conclusions drawn from them are limited in validity. If these conclusions are applied to the real world without consideration of what they have omitted, in other words, if they are treated as it they were accurate representations of concrete reality, the consequences can be destructive.

Daly saw that Whitehead described well what takes place in much economic theory and in its application to society. He and John B. Cobb, Jr. organized much of their joint 1989 book, *For the Common Good: Redirecting the Economy toward Community, the Environment, and a Sustainable Future,* around four of these abstractions: the market, economic success, *Homo economicus*, and land. In the 1994 expanded version, Daly added an appendix on money.

The book proposes alternative concepts to those that are criticized. These concepts are based on different abstractions that take more of the actual reality into account and are more sensitive to what they neglect. To indicate the ways in which different assumptions lead to different policies, additional chapters propose many such policies. The first of these chapters points out that the ideal of free trade is based on the fallacy of misplaced concreteness, that a more concrete analysis supports a decentralized economy.

For the Common Good won the Grawemeyer award for ideas improving world order. It remains the most fully developed discussion of economic theory from a communitarian and ecological perspective. It is also the most explicitly and intentionally Whiteheadian treatise on this subject. In addition, both authors believe with Whitehead that religious faith has a role to play in history. They think that it is crucial to change the destructive direction of events and that a Whiteheadian theology is relevant to the task of reframing economic thinking and practice.

This difference follows from the replacement of the classical /Homo economicus /with "person in community." the classical /Homo economicus /is understood in a fully individualistic way. He is related to other individuals through exchange and contract. Each of these individuals aims to attain as many goods and services as cheaply as possible while getting as much as possible for the least labor. Relations among people are, in philosophical terms, purely external and they become, therefore, purely competitive. The population as a whole is made up of such individuals. Obviously, much economic behavior conforms to this model, so that theories based on it have predictive use. Nevertheless, it involves a radical abstraction, which is acknowledged and then forgotten. People do not exist, could not exist, in this self-enclosed way. Recognizing that families cannot be understood as simply a collection of individuals, economists sometimes speak of households rather than persons as the units of the economy. It is then households that are related to one another in this purely external way.

Whitehead teaches us that we consist largely of /internal/ relations, which he calls "prehensions." These relate us to one another not only in the family but also in the wider society in such a way that our own well being is bound up with the well being of others. The good life is life in community,. Actually, we can develop a healthy individuality only in a healthy community. Hence we understand human beings better as "persons in community." Many human actions, even economic ones, express our concern for the communities in which we live. A Whiteheadian economics will be "economics for community."

Since the idea of "community" plays no role whatever in standard economic theory, the contrast is sharp. When national policies are shaped by standard economic thinking the goal is to increase overall production and consumption. It is believed that this is best done when the size of markets is increased and each region within the market specializes in what it can produce most efficiently. Also government involvement should be kept to a minimum. A global market in which the role of national governments is minimized and corporations are free to act as they

please is the ideal toward which the world has moved. This is the meaning of the "free trade" to which so many people have given their allegiance. In the process of realizing the ideal of free trade, tens of thousands of villages and small towns are being wiped out to be replaced by vast urban slums. In evaluating the results, the loss of community life is not even mentioned.

Clearly the Whiteheadian view of people as persons in community leads to quite different policies, usually called "community development." This expresses the Gandhian ideal. Gandhi wanted to improve the lot of the people of India, most of whom lived in peasant villages, by improving the quality of village life. That meant introducing tools and technologies that could be used by the villagers to increase their production. Of course, not all production would be at the village level and there would be trade among villages. But the emphasis would be on an economy that allowed persons in community to shape their community life and decide how to relate to others. Having experienced the human devastation caused by the global economy, more and more people today are recognizing the value of local economies.

The co-author of the book, John B. Cobb, Jr., is a Whiteheadian theologian who sees the dominant economic theory as the ideology or "theology" that is most widely determinative of the course of events. Accordingly, he brings his Whiteheadian theology to bear on the assumptions of economic theory. He believes, with Daly, that current economic practice is destructive of both human society and its natural environment, and that its justification by economic theory should be challenged. From this point of view, Cobb has published several books dealing with the course of world events as they are informed by the dominant ideology as well as with more general questions of how Christianity does and should understand human society and the natural world.

Contemporary Schools of Economic Thought

Julie A. Nelson[i]

The currently dominant school of economic thought among Euro-American academics is neoclassical economics, which is centered on an image of rational agents borrowed from classical liberal philosophy. Other contemporary schools of economics—such as post-Keynesian, Austrian, institutionalist, feminist, critical realist, radical, ecological and humanistic economics—offer critiques of neoclassical economics. The alternatives proposed often, in part, move in directions that are somewhat more in line with Whiteheadian process thought. In no case, however, has a Whiteheadian ontology been fully adopted and applied. This article points out actual and potential connections between process thought and economics, taking a feminist-process perspective.

1. Neoclassical Economics

Mainstream neoclassical economics is very much based on a radically reductionist, individualist, substance-and-attribute ontology. This ontology presumes the pre-existence of discrete, well-defined, rational, self-interested, and autonomous agents, but pays very little attention to the formation of these agents. In particular, it takes their preferences for goods and services as a given. Not only individuals, but also multi-person groups such as households and firms are treated in the core model as though they were individual agents. This allows neoclassical economics to sidestep any consideration of relationships that might involve the least degree of interconnection or interdependence. In the core model, the agents interact with each other only at arm's length, communicating only through impersonal, mechanically-functioning, and perfectly competitive markets.

The preferred tools of the neoclassical economist are logic and mathematics. The economist, it is assumed, sits apart from the object he ("he," since, historically, the vast majority of economists were male) studies. Like a Newtonian physicist, he is assumed to need only know the universal, unchanging rules and principles that undergird the economic system in order to make assertions and predictions about it. Among these rules is the proposition that agents make their choices so as to maximize utility (if they are consumers) or profits (if they are firms).

The most common definitions of economics hold that it deals with the behavior of markets, or that it explores the ways rational individuals make decisions in the face of scarcity. In either case, it is assumed that the discipline is a "science"—i.e. objective and value-neutral. Aspiring to a narrow and rigid ideal of objectivity, mainstream economics accepts only *efficiency* as a normative goal. Here, an action or system is efficient if there exists no change which would

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increase one agent's utility without lowering the utility of another. Efficiency is assumed to be a universally accepted good, and one that therefore can be adopted as the sole normative standard: by referring all considerations to it, neoclassical economists hope to avoid making subjective and controversial value-judgments.

Much study and research in economics is devoted to the elaboration of mathematically-formulated rules and discussion about whether efficiency is or is not achieved, under various modifications of the basic scenario. The concept of human need is—surprisingly, to any who might argue that economics should have something to do with human survival and flourishing—banished from the discipline, as too ill-defined for an allegedly objective science. Even the recognition that high unemployment is bad has been sidestepped in recent decades by a focus on the theoretical "micro-foundations" (that is, explanations by means of rational choice and markets) of macroeconomic phenomena. All of these assumptions, of course, are rarely made explicit. The student of economics is very rarely taught anything about the history or philosophy of the discipline, or encouraged to pay attention to real-world problems like poverty, injustice, or the destruction of the natural environment. Instead, the student is plunged immediately into abstract graphs and equations.

2. Contrasts with Whiteheadian Thought

The contrast with a Whiteheadian process ontology could hardly be more dramatic. Neoclassical economics regards agents as pre-existing and radically separate from each other. Process thought regards all agents as continually coming into being and creating the basis for the next moment as an aspect of a deeply interconnected whole. Neoclassical economists regard economies and markets as preexisting, mechanical, closed systems, with predictable behaviors that that they can aspire to model in elegant, abstract detail. In process thought the world—including, presumably, markets and other economic institutions—evolves as an organismic open system, with novelty as an integral feature. In neoclassical economics questions of value are equated with individual, subjective utility. More pressing for Whitehead are questions about "ultimate values" (*SMW* 203).

Neoclassical economic theory was not yet as deeply entrenched in Whitehead's creative period as it is now, and Whitehead did not engage at great length with this form of economic thought.[1] However, he did write at considerable length about Cartesian thought and how during the eighteenth century "the notion of the mechanical explanation of all the processes of nature finally hardened into a dogma of science" (*SMW* 60). Since these influences strongly shaped the development of neoclassical economics, much of his critique is *apropos*.[2]

Whitehead also wrote about the world of commerce and industry. While such writings are not about economic *thought* per se, they do give us some clues about what he might have said, if pressed. For example,

> in the nineteenth century, when society was undergoing transformation into the manufacturing system, the bad effects of [Cartesian] doctrines have been very fatal. The doctrine of minds, as independent substances, leads directly not merely to private worlds of experience, but also to private worlds of morals. The moral

> intuitions can be held to apply only to the strictly private world of psychological experience. Accordingly, self-respect, and the making the most of your own individual opportunities, together constituted the efficient morality of the leaders among the industrialists of that period. The western world is now suffering from the limited moral outlook of three previous generations (*SMW* 195-6).

It is neoclassical economic thought that provides the academic *imprimatur* to the current dogma that individual utility ("the strictly private world of psychological experience") and self-interest ("the making the most of your own individual opportunities") are intrinsic and central to economic life. As neoclassical economics takes the abstract concepts of Cartesian thought and translates them to the practical world of "industrialists" of Whitehead's time and our own, it can clearly be brought under the Whiteheadian critique.

3. Feminism, Process, and Economics

Neoclassical thought fails to recognize the importance of relationships and interdependencies among people, and between people and the larger environment. One of the ways this is most dramatically manifested is in its neglect of those parts of life that have traditionally been associated more with women than with men. Feminist economists have brought to light many gender-related biases in mainstream economics which can be seen as closely related to its rejection of a Whiteheadian ontology of connection and organicism.

Note that the agent of neoclassical economic theory has no childhood or old age, and thus no periods of dependence and no need for the sorts of care traditionally provided by women. The rational agent has no emotions, no bodily needs, no intuitions, and not much use for sensitivity, receptivity, or thoughts about ethical behavior in relation to others and the natural world.

In traditional Western thought, women have long been associated with the natural, presumably pre-rational world, and treated as merely part of the passive, exploitable environment that (invisibly) supports the activities of rational "man." Considerable innovative feminist research during the 1980s (e.g. Harding 1986; E.F. Keller 1985) explored the historical, philosophical, and psychological ramifications of this highly gendered way of viewing the world within the development of science. From the early days of the scientific revolution, notions of reality and its exploration have been highly colored by an association of masculine-identified characteristics of autonomy and rationality with superiority and true knowledge. Resistance by mainstream philosophers to Whiteheadian concepts of feeling, connection, vagueness and value take some of their force, a feminist analysis would imply, from the psychological habit of perceiving these aspects of life as soft and feminine, and therefore inferior, compared with masculine-associated rationality, distance, precision, and neutrality (Nelson, 2003a).

Feminist scholars have struggled to come up with more adequate ways of thinking about men, women, gender, and knowledge. One strain of feminist thought, sometimes referred to as "liberal feminism," tends to argue, in essence, that women as well as men are (or can be) rational agents. This approach retains classical liberal values of individuality and rationality, but extends them to women. Another strain, sometimes referred to as "cultural feminism," questions

the primacy of those values, and argues for a revaluation of cooperation, emotion, and other-interest as important dimensions of human life. Sometimes this line of thought falls into the trap of essentialism, reinforcing a hard-and-fast dualism by asserting that women are "by nature" more relation-oriented than men. At other times, it makes the mistake of seeking merely to flip the tables, rejecting all masculine-associated characteristics and elevating only feminine-associated ones.

A third option, derived from feminist process thought, offers a way past the Scylla and Charybdis presented by liberal and cultural feminisms. Feminist process theologian Catherine Keller in *From a Broken Web* (1986) examines the mythical image that she calls the "separative" self. The separative self is an autonomous, self-possessing, independent, rational individual, imagined as over and against society, the world, and even his own body. Intimately paired with the separative self is the "soluble self." The soluble self is self-negating, dissolved in others, and absorbed in all the emotional and bodily activities that invisibly support the separative self in his illusions of autonomy.[3] What these mythical images serve to hide is exactly Whitehead's insight that we are all individually valuable yet at the same time intrinsically made up of our relations in community—that each of us is both individual and related. Traditional masculine roles emphasize the individual side, while traditional feminine roles emphasize the related side. This dualism serves to drive people of both sexes into rigid, substantivist identities and away from a realization of our authentic, organic becoming.

What is needed, instead, is a more dynamic understanding of ourselves as both/and—both individual and related, both rational and emotional, both competitive and cooperative, and so on. Overcoming sexist bias, in this case, is not a matter of rejecting the separative self in favor of the soluble self, but rejecting the dualism itself in favor of a more complex and truly relational understanding. Feminist economists have begun to apply such analysis to the economics of households and of other groups (Ferber and Nelson, 1993, 2003).

An understanding of human behavior as dynamic, evolving, and highly interdependent and laden with value, of course, also requires a rethinking of the methodology of economics. The abstract, deductive approach of neoclassical theorizing is intimately linked with its assumption of the primacy of the separative self. The positing of discrete units whose behavior follows universal "laws" facilitates an analysis based on logic and mathematics. Consideration of the existence of fundamental interdependence makes us face the fact that the world is much richer and more complex than is generally acknowledged in neoclassical thought, and that much of reality lies beyond the reach of its conceptual tools. Many feminist economists have raised questions about the narrowness of mainstream methodology, and encouraged more use of concrete experiential data, qualitative studies, and the like. The response of mainstream economics to such critiques has been largely dismissive. One paradigm tends to dominate economic thought in most universities in the U.S., Europe and elsewhere. Anyone who challenges that paradigm is simply dismissed as "not doing economics."

My own work, which takes a feminist-process approach (informed both by Whiteheadian thought and by related insights from American pragmatist and Buddhist philosophies) diverges not only from mainstream economics (in which I was trained) but also from that of many other feminist economists. While critiques of "economic man" and of the one-sided hegemony of

abstract mathematical analysis now seem quite obvious to the majority of feminist economists, fewer are drawn to engage in discussions of ontology and value. Many see such discussions as too philosophical to be relevant to their practical work, or (rightly) fear that their work will seem even less "objective" to their economics colleagues if they engage in discussions of value and purpose. So it is in engagement with the smaller and often somewhat more self-reflective heterodox schools of economics that discussions of ontology and Whiteheadian thought may sometimes arise.

4. Whitehead and Heterodox Economics

While neoclassical economics has a hegemonic hold over economics teaching and research in many countries, other schools of economics exist at the margins. In one case, there is evidence of a possible direct connection to Whitehead: the British economist John Maynard Keynes was influenced by Whitehead when they were both in Cambridge during the first years of the twentieth century (Hodgson 1993, 11).[4] Keynes' famous *The General Theory of Employment, Interest and Money* (1935-36) presented a major challenge to the market-oriented thought dominant in the 1930s. Developing Keynes' insights further, the current school of post-Keynesian economics considers capitalist market economies to be evolving and inherently unstable. Some post-Keynesian economists have suggested that Keynes used a distinctly organicist ontology (Chick and Dow, 2001).[5]

A number of other heterodox schools share the idea that economies are open systems that are fundamentally complex, dynamic, and unpredictable, rather than (as assumed in mainstream thought) closed systems, amenable to distillation into mathematical formulae. Austrian economics, for example, founded in Vienna by Joseph Schumpeter and Friedrich Hayek and others in the early 20th century, emphasizes activity, dynamic processes, creativity, and innovation. Schumpeter's famous theory of "creative destruction" would never fit within a mechanical neoclassical model. Austrian economics is, however, notably non-Whiteheadian in its extreme individualism and its libertarian political stance.

A more promising school is institutionalist (or evolutionary) economics, which developed in the early decades of the twentieth century in the United States (see Hodgson, 1993). Its early leaders included Thorstein Veblen and John R. Commons. Although this school's founders seem to have had no connection with Whitehead, I find the basic directions of this school quite Whitehead-friendly. At its best, institutional economics sees the world as being continually in creation, and gives a balanced ontological importance to both stability, order, habit and the past on the one hand, and flux, chaos, novelty and the future on the other. The best institutionalist economists also direct their work explicitly towards the promotion of valuable ends. In part influenced by American pragmatist philosophy, institutional economists tend to reject dogmatic theories in favor of investigating how businesses, governments, and other social institutions can best be adapted to meet pressing economic problems.[6] The "critical realism" approach defended by contemporary British economist Tony Lawson also advocates an open-system approach. Unfortunately, it is based on an ontology of "structures, powers, and generative mechanisms"

(Lawson 1999, 31) that provides inadequate support for its claims of philosophical sophistication and liberatory intent (Nelson, 2003a).

The work of process theologian John B. Cobb, Jr. has made the ideas of humanistic and ecological economics familiar to many process thinkers. Contemporary humanistic (or socio-) economics tends to emphasize ethical dimensions of economic behavior within human communities, while ecological economics views human activities within the broader context of a complex and fragile planetary ecosystem. Cobb's work with ecological economist Herman Daly, most notably *For the Common Good* (1989, 1994), has been very influential in contemporary humanistic and ecological economics circles. Many of Daly's and Cobb's critiques of neoclassical theory and present global economic trends are right on target. But, in more subtle ways, their prescriptions for change reflect some habits of thinking against which Whitehead himself warned us.

In Cobb's view, market systems inexorably lead to concentration of wealth, and transnational corporations are, more or less, demonic powers bent on destroying value and community (see e.g. Cobb 2002, 5, 8). Such views borrow subtly from older radical or Marxist economic beliefs about the presumed inherent dynamics of capitalist systems. While radical economics has generally presented itself as the main *alternative* to neoclassical economics, it, ironically, shares the same ontological base. The sort of Marxian thought that posits inexorable capitalist dynamics is essentially a variant of classical economics, which grew from the eighteenth-century work of Adam Smith. Smith's idea that the economy is a large machine whose behavior is driven by physics-like "laws" provides the ontological basis for both neoclassical "laws" of optimization and the Marxian "law" of capital accumulation. And this perspective was, of course, an outgrowth of the particular scientific worldview of Smith's time. In both neoclassical and (much) Marxian thought, the idea that economies might be evolving human-made creations is rejected in favor of an image of an abstract economy driven by universal principles and rules. What we see in real-world patterns of production and exchange, these schools imply, is merely a somewhat imperfect manifestation of the abstract ideal with its behind-the-scenes forces and principles.

In rejecting the observed, evolving world in favor of idealized principles as our touchstone for knowledge, these views demonstrate what Whitehead called the "fallacy of misplaced concreteness." For instance, in one passage Whitehead writes:

> A factory, with its machinery, its community of operatives, its social service to the general population, its dependence upon organizing and designing genius, its potentialities as a source of wealth to the holders of its stock *is an organism exhibiting a variety of vivid values*. What we want to train is the habit of apprehending such an organism in its completeness. It is very arguable that the science of political economy, as studied in its first period after the death of Adam Smith (1790), did more harm than good. It destroyed many economic fallacies, and taught how to think about the economic revolution then in progress. But it riveted on men a certain set of abstractions which were disastrous in their influence on modern mentality. *It dehumanized industry* (*SMW*, 200, emphasis added).

One possible reading of this passage might interpret it as saying that classical political economy converted some sort of earlier, humane, organic industrial system (that is, the sorts of factories referred to early in the passage) into an inhuman economic machine. But this ignores history

and mixes up abstractions and reality. The factories that Whitehead refers to as organisms must be *contemporary* factories, since history contradicts the notion of an early industrial Eden. The correct way to understand this passage, I claim, is to see Whitehead as stating that even present-day global market systems and transnational corporations are process-based, human-made organisms. Whitehead was arguing, I believe, that the abstractions of classical (and later neoclassical) thought have created a *belief* that economies are something other than human organizations, and that this *belief* has been used to justify inhumane actions. Corporate leaders dehumanize workers when they treat them merely as inputs. But progressive thinkers also "dehumanize industry" when they portray corporate leaders as mere personifications of greed, or imagine corporations to be non-human entities inexorably driven by unseen forces.

There are good empirical reasons to believe, instead, that markets and corporations are evolving human organizations, and that the strength of the "laws" that supposedly drive them have been very much overstated (Nelson, 2006). This realization can have subtle but important effects on prescriptions for (much-needed) economic transformation. Instead of envisioning economic transformation as a battle between ethical human communities and demonic inhuman corporations, one is challenged to identify and support the value-enhancing processes within human organizations of any kind, and to resist the value-destroying tendencies within human organizations of any kind.

Cobb's and Daly's prescriptions for change tend to have a devolutionary, retrenching, and negative tone to them. They prescribe the breaking up of large corporations, the withdrawal of international ties, and the halting of economic growth. These are perfectly understandable reactions if one perceives the problem as a battle between human values and an inexorable global economic machine that has gone out of control. In a similar way, *Life Abundant: Rethinking Theology and Economy for a Planet in Peril* (2001) by feminist process theologian Sallie M*cf*ague contains many insights, but ends on a negative note, with its advocacy of sacrifice and self-denial. While the sorts of ecological and human suffering that Cobb, Daly, and M*cf*ague describe are as important and pressing as these writers claim, a fully process-oriented understanding points towards more positive and creative solutions.

The goal should not be to try to defeat a presumed global economic machine, but, first, to recognize that the machine image is, in fact, a product of an eighteenth-century view of the world and our habits of abstraction. Rather than retreating, we need to realize that the real world of human economic endeavor is living, evolving and alive with, as Whitehead wrote, "vivid values." In practical terms this would entail, for example, dropping the idea that corporations cannot be socially and ecological responsible because economic "law" dictates that they must maximize profits. Instead, it means starting to seriously demand that they—and we, as workers, consumers, and in all our other roles—act with the social and ecological responsibility, creativity, and respect for inherent value that we are called to realize from our locations within the organic whole. It does not mean retreating, but rather plunging forward with all the creativity we can muster to "grow" our economies in ways that serve life rather than defeat it.[7]

5. Conclusion

Whiteheadian thought on economics challenges the common belief that economies are lifeless systems, driven by rules and laws that lie beyond human control. It provides an adequate ontology for the notion that economies are creative, evolving, and value-laden. As such, it also provides an adequate intellectual explanation for why taking action in the economic world in line with ultimate values not only makes sense, but is the most important thing we can do.

Notes

[1] See Johnston in this volume for a review of Whitehead's writings on economics.

[2] See Nelson (1993) for more on the Cartesian roots of neoclassical economics.

[3] Sociologist Paula England and I, in the early 1990s, recognized in this analysis a key to understanding the creation of the image of separative "economic man" and the denigration women and relationships. In 1993 England wrote "The Separative Self: Androcentric Bias in Neoclassical Assumptions" for a collection I co-edited, and from that time the term *separative self* has become part of the discourse of feminist economics.

[4] Whitehead also refers to Keynes work on probability theory (*PR* 206).

[5] Two notes of caution are in order. First, there exist sub-fields *within* mainstream economics that share its basic ontology and methodology, but which have names similar to the heterodox schools discussed here. "Keynesian" economics is a subfield of the mainstream, while post-Keynesian economics has an open-system ontology. Similarly, "new institutionalist" and "environmental" economics are essentially mainstream, while ("old") institutionalism, and ecological economics break the mould. Secondly, many heterodox scholars, even when they claim to have a more open and processual ontology, fail to extend this to thinking about gender. As a result, when it comes to gender, heterodox economists are frequently as rigid or ignorant as their mainstream peers.

[6] For more on the relation of institutionalism, pragmatism, and process thought see Nelson (2003b).

[7] See Nelson (2006) for more on this point in general, and, more specifically, Nelson (2003c) on the work of M*cf*ague.

Management and Organization Studies

Mark R. Dibben[i]

> People say that machinery and commerce are driving beauty out of the modern world. I do not believe it. A new beauty is being added, a more intellectual beauty, appealing to the understanding as much as to the eye (*OT*, 67).

Alfred North Whitehead's own thoughts on management are largely confined to his statements on the role of business schools in tertiary education. These are to be found primarily in two addresses, a decade apart, the first "at the Prize Distribution, Borough Polytechnic Institute, Southwark, February, 1917" (*OT*, 58-68) and the second, a May 1927 address to a meeting of the "American Association of the Collegiate Schools of Business" at the Harvard Business School (Whitehead, 1928). Although both deal with similar arguments for the cultivation of foresight and insight, and indeed were ultimately reprinted as consecutive chapters—interestingly in reverse order (VIII and VII respectively)—in "The Aims of Education," neither were intended as philosophical pieces *per se*.[1] Rather they were intended to make public arguments for the teaching of business in higher education in terms of its broader contributions to economic and social life:

> It is not enough that [business men] should amass fortunes in this way or that and then endow a college or a hospital. The *motive* for amassing the fortune should be *in order* to use it for a socially constructive end […]. It is time to teach business its sociological function; for if America is to be civilised it must be done by the business class, who are in possession of the power and the economic processes. I don't need to tell you there is a good deal of sniffing on this, the Harvard College and graduate school's side of the Charles River […] at the new Harvard School of Business Administration on the opposite bank. That strikes me as […] unimaginative. […] Universities [… should] be taking business in hand and teaching it ethics and professional standards (*D*, 63-4).

This is true also of a later address to an April 13th 1933 "meeting held in commemoration of the 25th Anniversary of the founding of the Harvard Business School" (Lowe and Baldwin, 1951, 768), later published in the *Harvard Business Review* (Whitehead, 1933; also Johnson, 1959). In this, his only recorded publication on management studies (Lowe and Baldwin, 1951), Whitehead provided more of a contemporary and practical rationale for the education of businessmen than that found in the two earlier addresses. Noting that a twofold trend towards individualism and a growing reliance upon employers was creating a freedom of choice constrained by the need to work—what he termed "iron-bound conditions of employment and trivial amusements for leisure"—Whitehead advocated the study of business and management through "direct observation and practical experience." This, he suggested, was essential because

> the change in scale of modern industry has made nearly the whole of previous literature on the topic irrelevant, and indeed mischievous […]. Unless the twentieth century can produce a whole body of reasoned literature elucidating the many aspects of this great topic, it will go hard with the civilisation that we love

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(Whitehead, 1933; cited in Johnson, 1959, 70).

Such study, Whitehead argued, should focus on at least three key areas: 1) industrial and managerial psychology; 2) the role of technology in work and employment, particularly the phenomenon of "technological unemployment;" and 3) the development, sale and distribution of individually tailored products within a mass manufacturing system.[2]

Despite this single foray into management studies—a foray almost entirely unnoticed, in spite of its prophetic insight into the nature and future impact of business on society—Whitehead's influence on the field has been considerable. First, we may surmise that Whitehead had at least some influence on the contributions which his son, T. North Whitehead, made to the seminal Hawthorne studies of worker productivity in large scale industry (1924-33), published in 1938 (Whitehead, 1938); the Hawthorne studies were, after all, very much industrial and managerial psychology studies of the role of technology in work and employment, relying upon direct observation and practical experience. Furthermore, Whitehead's letters to his son from 1924-29 reveal a tendency to discuss his own thinking as it might apply to his son's work; at the same time, he often sent him pre-copies of those works he felt would be of most interest, such as *Science and the Modern World* (Lowe, 1990, 279-341).[3]

Second, and perhaps more substantively, the rise of organization studies[4] as a legitimate field within management as a social science after WWII, and notably since the 1970s, has provided an increasingly receptive forum for more generic aspects of Whitehead's philosophy, namely the *Fallacy of Simple Location* and the *Fallacy of Misplaced Concreteness*, to be applied to the understanding of the management experience of business and other work organizations. In this brief review we examine key areas within the field to which Whitehead's thinking has been applied. We note some of the limitations of these uses and suggest certain extrapolations, in order to point out further possible applications of Whitehead's thought for future study of the nature of managerial and organizational life.[5]

1. Applications of Whitehead's Thought in Management and Organization Studies

> It is no accident that an age of science has developed into an age of organisation […]. Science is the organization of thought, but not any organization of thought […]. Organisation is the adjustment of diverse elements so that their mutual relations may exhibit some predetermined quality (*OT*, 105).

> My point is that the final outlook of Philosophic thought cannot be based upon the exact statements that form the basis of the special sciences. The exactness is a fake (Whitehead, 1941, 700).

A recent review of the development of organization studies in America by its pioneering scholar James March (e.g. March and Simon, 1958) and colleagues would suggest that, rather than being regarded as central to the field, process oriented research in general (much less the "strong view" to which process philosophy ascribes) is not regarded as playing even a minor part either in its post-war history, or its future (Augier *et al*, 2005). Nevertheless, a broader review of the management and organization studies literatures beyond the United States

uncovers growing recognition of the value of process thinking, especially among European scholars. Whitehead is here used (along with other more popular process philosophers such as Bergson, James and more recently Merleau-Ponty and Deleuze) to help provide the philosophical basis for one of four recognized approaches to studying organizational change (Van deVen and Poole, 2005).[6]

There is a fundamental reliance, however, on the less technical aspects of Whitehead's explanations of process, primarily those found in "The Century of Genius" (Chapter III of *Science and the Modern World*), which provides an argument against the Newtonian assumptions that still pervade the social sciences. Beyond this, there is some use made of Whitehead's work on education, notably "The Aims of Education" and "Universities and their Function," Chapters I and VII of *The Aims of Education and Other Essays*, in order to develop arguments for the cultivation of insight and the nature of leadership in management. Similar use is occasionally made of 'Science and Philosophy' (Chapter IX) and 'Aspects of Freedom' (Chapter IV) of *Adventures of Ideas*, as well as small snippets from *Modes of Thought* for the same purpose. Beyond this, we find very occasional references to, mostly, the introductory parts of *Process and Reality*, and this only to embellish that found on the nature of process as the ultimate reality in *Science and the Modern World*.

This can hardly be described as a wide ranging and comprehensive use of Whitehead's work; at most it amounts to no more than fifty individual pages cited from some half-dozen of his ninety English language publications (Woodbridge, 1977; *cf*. Lowe and Baldwin, 1951). Furthermore, those of his works that are used are primarily those written by "Whitehead the philosopher of science," as opposed to "Whitehead the metaphysician." Yet its impact on the field of management and organization studies, particularly over the past decade, is out of all proportion to either the number of works cited or the technical sophistication of the material quoted. So much so that citing a Whitehead book has become *de rigeur* for any article purporting to discuss processes of managing and/or organizing. Unfortunately, it follows that the frequency of Whitehead's citation in the field is, with the notable exceptions of those authors discussed in detail below, often inversely proportional to its comprehension of him.

2. Robert Chia

While the genesis of Whitehead's use in management and organization studies can be traced back at least to the 1970s (e.g. Cooper, 1976—see below), the popularity and influence of Whitehead in contemporary management and organization studies is in no small part due to the scholarship of Robert Chia. A survey of subject areas within management, such as managerial decision making (1994, 2003: decisions are no longer "events," intentions, choices, but a series of pre-definitive acts of punctuating the flow of human experience, producing a version of reality to which managers and workers respond), entrepreneurship (1996a, *cf*. Dibben, 2000, 2004a and Khalil in this volume: rather than exploration and exploitation of new business opportunities being separate activities, exploitation is a paused, stabilized moment of the exploratory), organization theory (1992, 1996b, 1997, 1998, 1999; Tsoukas and Chia, 2002:

organizations are not static structures but ever-shifting groupings of dynamic acts of organising, which is itself an interminable ontological quest of arresting, punctuating, isolating and classifying the essentially undivided flow of human experiences) and management learning (Chia and Morgan, 1996; Chia, 2005) reveals that his use of process thought is invariably the benchmark for any subsequent analysis (Dibben and Munro 2003). Due to both the painstaking nature of its development and also its inherent conceptual richness, Chia's work is not only the first word on the subject in the management and organization studies literatures, but often the final word also. Rarely has one person galvanized and reshaped the discourse of his discipline in such a manner, and in such a short space of time.

The most complete rendering of Chia's arguments for a process perspective in management are perhaps found in an article written specifically for the journal *Process Studies* (Chia and Tsoukas, 2003), which combined key elements from a number of previously published articles (including the original draft of an article that had appeared with substantial revision / simplification—all references to Whitehead removed—in the leading management journal *Organization Science*; Tsoukas and Chia, 2002[7]) into a single piece, as a demonstration of the use of process philosophy in the field. In summary, the argument proceeds as follows.

Management and organization theorists, Tsoukas and Chia argue, are not good at thinking process and movement. Their instinctive conceptual skills favor the fixed and the static, the separate and the self-contained. Taxonomies, hierarchies, systems and structures represent the instinctive vocabulary of management and organization theorists in their determined subordinating of flux, movement, change and transformation. Dominant models of change in general and organizational change in particular are, therefore, paradoxically couched in the language of equilibrium and fixity. The standard construal of organizational change and the strategies that are formulated to manage that change are shaped by deeply ingrained habits of thought, which surreptitiously privilege substance, stability, and spatial order over process, change, and temporality. One major consequence is that process and change are construed in orderly terms; changes are hypostatized and treated as exceptional rather than natural.

Starting with this premise, Chia and Tsoukas use Whitehead, Bergson, Deleuze and others to argue that, on the contrary, change is the pervasive feature of organized contexts of action, for it stems from actors' re-weaving of their webs of beliefs in order to accommodate new experiences obtained through interactions with others and with one's own thoughts. Organizing is an attempt to order the intrinsic flux of human action through generalizing and institutionalizing particular cognitive categories. Organization is an exceptional effect produced by the deliberate slowing down of change. The effort to generate stabilized patterns of interaction is inherently temporary and intrinsically incomplete. Change in organization is not externally imposed, but immanently produced. In that sense it is better to talk about organizational *becoming* rather than change. (Dibben and Cobb 2003, 180-81)

In this way, Chia's writing and that which has followed it (e.g. Wood, 2002 and 2005b; *cf.* Linstead, 2002 and Styhre, 2002) uses process thought essentially to turn passive static noun into active changeful verb, such that organization becomes organizing, management becomes managing, knowledge becomes knowing and so on. It then uses this reconceptualization to derive insightful commentary on the nature of management. For example, developing

Whitehead's commentary regarding education and the business school (*AE* 136-52), Chia argues that the philosopher-manager engages in an ongoing education of intellectual and emotional preparation. This allows him to be aware of the need to avoid the conceptual closure afforded us by the dominant cultural norms, actions and beliefs expressed through the professional language of managerial life (Chia and Morgan, 1996).

Such preparation consists of being open to Whitehead's "creative advance into novelty," allowing a Whiteheadian "awakening" of the senses to the myriad possibilities afforded by the imaginative recombining of new information into renewed understanding and, as a result, foresight. In this sense, Chia argues management learning consists of a continual intellectual process of knowledge-making through the momentary stabilizing and encoding of patterns of informational and human relations. Management knowledge is therefore "always about to become something other than itself" (Chia and Morgan, 1996, 58; *cf*. Chia, 1996a).

3. Robert Cooper

Chia's appreciation of Whitehead has its genesis in his doctoral supervisor's landmark essay, "The Open Field," published in the interdisciplinary social science journal *Human Relations* (Cooper, 1976). Robert Cooper here developed a "process epistemology" by combining Whitehead's notion of an extensive continuum—what Cooper called an "abstract field"—with the thinking of a variety of philosophically oriented psychologists and sociologists to argue man as "ever open and unfinished" in a Heideggerian sense,[8] experiencing himself and the world as an "open field." However, perhaps because of the influence of and reliance upon such a variety of other writers, his "process epistemology" arguably lacks any substantive use of Whitehead's core principles of panexperientialism and internal as well as external relations, leaving his concept of process constrained to being "the action between beginning and end" (1976, 1011).

This remains in Cooper's more recent thinking developing the work of Merleau-Ponty, Foucault and Levinas on the nature of relations (2005). This, as with his original work, provides a processual analysis of human agency; relationality concerns the "interspace" between separate things. From the perspective of organization, Cooper has argued it is not the elements within the organization *per se*, but rather the relations between those elements that constitute the organization, some of which will be contentious and unstable and some of which may be relatively stable and hence describable as "organizational structure" (Cooper and Law, 1995; also Cooper, 1986). From this perspective, the *boundary* of an organization (as opposed to the more standardly rendered organization itself) is now a site of struggle, contest and change where energy is continuously expended in dividing the inside from the outside (Dibben and Munro, 2003).

Thus, although Cooper's work draws to a certain extent on Whitehead to "articulate the nature of a processual and emergent form of knowing and its consequences for strategies of intellectual inquiry" (Chia 1998a, 4), a thoroughgoing Whiteheadian expression of the nature of experience is not taken up. In spite of this, and unlike Chia's considerably more prolific focus on selective applications discussed above, Cooper's approach is perhaps the most intuitively Whitehedian

expression to be found in the management and organization studies field (see also Chia 1998a, 1998b; Cooper 1987 and 1992).

4. Martin Wood

One scholar who has recently recognized and sought to grapple with the problem of how to move comprehensively beyond discussions of external relatedness in management and organization studies is Martin Wood. Focusing on the notion of leadership, Wood argues discussion of leadership should not be directed toward distinguishing a state, but rather toward internal relatedness,

> toward the identification of an essential movement, in which what endures is internal qualitative difference: the being-itself of difference, and not the sameness of identity. The idea of simple, objective location has gone and the relation as a thing itself is brought to the fore (2005a; *cf*. 2005b and 2003).

In this way, Wood extends the standard use of Whitehead's "fallacy of misplaced concreteness" beyond a straightforward explanation of the primacy of process to one which addresses directly the problem of contemporary process discourses in the field, discourses that retain the static understanding of "self-identical individualism and discrete relatedness, and thereby leave the relation external to the related" (Wood, 2005a).

Wood is perhaps alone among his contemporaries, therefore, in genuinely rising to the challenge of focusing on processes rather than things. In so doing, he argues leadership is "going on within a subtle synthesis of internal differences without mediation or relation to others." The "essence" of leadership is thus more accurately seen as "the accelerating pace (and shrinking space) of relations of movement and rest, speed, slowness and simulataneity." This, as opposed to a "self-evident [and] particular leadership figure construed as a simple element, present at hand […]" (2005b, 285).

In this rendering of leadership, Wood shows hitherto partial expressions of process in the management field lack the capacity to articulate a sense of the managerial experience as "the subtle synthesis of internal forces that are always qualitatively relating through their difference" (2005a). As a result of this analysis of the impact of internal as well as external relations on the managerial phenomenon of leadership, Wood argues that management research must pay attention not to quasi-scientific neo-empiricism but rather to "the withdrawn or background processes of individuation," accessing the "*mise en scene* through the deployment of qualitative, interpretive and ethnographic research" (2005b, 287). If it is to grapple fully with the implications of a process ontology, therefore, the field should investigate

> how perpetual movement and divergent processes form a discrete body, or appear to obtain in a substantial set of individual qualities and capabilities, at the same time as preserving the uninterrupted continuity of our experience (Wood, 2005b, 287).

5. Management in the Process Studies Literatures

> An epic poem is a triumph of organisation […]. It is the successful organisation of multitudinous sounds of words, associations of words, pictorial memories of diverse events and feelings ordinarily occurring in life, combined with a special narrative of great events: the whole so disposed as to excite emotions which […] are simple, sensuous and passionate. (*OT* 105-106)

We have noted the uses of Whitehead's thought in management and organization studies and explored a number of contributions to knowledge this has enabled. For the most part, these can be described as resulting from the "selective application" of specific elements of the work of a variety of process philosophers to unpack a particular aspect of the topic under study (Dibben and Munro, 2003). As such, it rarely comes to grips with the technical details of process thinking, such as distinguishing between conscious discrimination, causal efficacy, presentational immediacy and symbolic reference, or recognizing panexperientialism.

A more complete use of Whiteheadian thinking to explore management and organization related topics may, however, be found in the process studies literature. Besides arguments against contemporary business globalization effects from an eco-relational perspective (Gare 1996 and in this volume; *cf*. McLaren, 2004, Daly and Cobb, 1994 and Cobb in this volume), the most in-depth explorations seek to develop Whitehead's explanations of emotional experience (*AI* 183-84, 192-93). In essence this involves a shift in the fundamental unit of analysis, from organization to individual human being. This allows more attention to be paid to core aspects of the mind-body problem (i.e. the nature and locus of experience), and thus greater integration with Whitehead's philosophy beyond the broad-brushed generalizations concerning process ontology and epistemology discussed above.

The acceptance of panexperientialism, coupled with a recognition of the significance of Whiteheadian relationality, allows detailed integrations of management and organizational issues. For example, a topic of continued interest to managers and management scholars is the role and effect of trust in and between organizations. A Whiteheadian rendering reveals the nature of its development, by exploring it in terms of the concrescence of an actual entity. This provides otherwise unavailable access to our experience of trust as a complex emotion by allowing (1) an important distinction to be made between trust in the present from past trust; and (2) the derivation of trust from the past prehension of the individual trusted. In any given interpersonal interaction, it is now possible to distinguish (1) prehension of past experiences objectified in part by trusting the other person and largely conformed to; and (2) the prehension of the person now, with a subjective form of trust. By reference to Whitehead's phases of experience, it follows both prehensions discussed thus far belong to the first phase. Their integration belongs to the second phase, which consists of the separation of the subjective form of trust learnt from prior experiences as an ingredient in the immediate prehension of the other person. This then continues with reintegration into propositional feelings and intellectual feelings concerning the other person and which, in the ideal case, strengthens the trust that concresces (Dibben 2004b, 36; *cf*. 2000).

Extending this method of integration with, as opposed to selective application of, Whitehadian process thought still further allows us to "transliterate" contemporary phenomena into Whiteheadian terminology, and thereby gain new insight into their processual nature. For example, it is possible to unpack information systems technology—a phenomenon Whitehead had no knowledge of—in terms of, for example, the given world of cyberspace or the human agent providing aim etc., providing determinate data; these are as objectifications of themselves that the characters of their actual entities can provide. In this way, relative to any actual entity, there is first a "given" world of settled actual entities and second a virtual reality potentiality that is real in effect, but not in fact, and which is the datum for creativeness beyond that standpoint. This will be recognized as the primary phase in the process that constitutes an actual entity, and is merely the actual world in its organized character as a possibility for the process being felt. As such, information systems technology can be shown to exemplify the Whiteheadian metaphysical principle that every being is a potential for a becoming, whereby the actual world comprises the objective content of each new creation (*PR* 65; in Dibben and Panteli, 2003).

In this way, two meanings of potentiality are apparent. First, the bundle of possibilities provided by the multiplicity of eternal objects, i.e. the countless mutually consistent or alternative possibilities extant in cyberspace, that makes up a "general" potentiality. Second, the "real" potentiality as conditioned (organized) by the data of the actual world but delimited by the human agent via the medium of information technology. Thus, while the general potentiality of cyberspace is absolute, the real potentiality of virtual reality is relative to some actual entity, such as a Google search request.

Such a rendering provides a positive appreciation of the impact of information technology on life experience (*cf.* Shields 2002). This is because, unlike less active media experiences such as watching the television, the interactivity that distinguishes virtual reality lies in the manner we

> enhance the uniqueness of each individual occasion, and at the same time disclose its essential relationship to occasions other than itself […bringing] into prominence the potentialities for alternative realisations, in the past, in the future and in the present (*MT* 105-6).

Besides such technical renderings of management topics and issues, process-thinking is also argued within process studies to be a practically powerful tool in both the daily life of business management and the strategic planning process of global corporations, encompassing issues such as salaries, treatment of workers, product development and manufacturing (D'Arcy and Dibben, 2005). Rather than the evil commonly associated with it, the practical application of Whiteheadian process thought to management allows the potency for good to be realized through seven significant activities (D'Arcy and Dibben 2005, 260). First, the gradual equalization of wages and other benefits, leading to less polarization of the world's wealth. Second, the placement of most countries on a more even playing field by a more complete sharing of materials across national boundaries. Third, a more complete development of businesses, markets and manufacturing through a more even spreading of investment capital across a broader range of geographical locations. Fourth, the provision of reasonable workers rights to a broader segment of the world's population. Fifth, the spread of environmental regulations and best-practices around the world. Sixth, a growing respect for differentiation and

appreciation of "otherness" as a result of the recognition that we are all interdependent with each other. Lastly, seventh, as a most significant and positive direct result of the globalization process, radically profound transformations in educational-understanding, informational-flowing, cultural-exchange, and religious dialogue.

6. Extrapolations

> We do not adequately analyze any one personal existence; and still less is there any accuracy in the division into species and genera […]. Let us [therefore] consider more closely the character of personal identity. A whole sequence of actual occasions, each with its own present immediacy, is such that each occasion embodies in its own being the antecedent members of that sequence with an emphatic experience of the self-identity of the past in the immediacy of the present (Whitehead 1941, 689-90)

> [H]uman experience can be described as a flood of self-enjoyment, diversified by a trickle of conscious memory and conscious anticipation […]. When memory and anticipation are completely absent, there is complete conformity to the average influence of the immediate past. There is no conscious conformation of memory with possibility. Such a situation produces mere matter […]. Thus the universe is material in proportion to the *restriction* of memory and anticipation. (Whitehead 1941, 695, my emphasis)

We have noted the main uses of Whitehead's thought in management and organization studies, along with a number of limitations, and discussed a small variety of different approaches to the use of Whitehead extant in process studies. These latter pay closer attention to the detail of Whiteheadian thought in their attempt to unpack the processual nature of management and organizational life experience. We are now in a position, therefore, to briefly revisit some of Whitehead's uses in the management field and consider both how a more complete Whiteheadian rendering may be possible and what the implications of such a rendering might be. We begin with Chia's discussion of management learning outlined above.

7. Management Learning

A more comprehensive use of Whitehead allows us to develop Chia's work further, through discernment of learning as a subjective experience of "transition" (Cobb and Griffin 1976, 14-15) from one moment of knowing to another. This knowing, as a momentary event, resides in one individual and to which the individual alone has direct access (Mead, 1934). Since knowledge is understood to be the "conscious discrimination of objects experienced […] derived from, and verified by, direct intuitive observation" (*AI* 176), learning also requires another individual or set of individuals as a stimulation for it (Dewey 1938, 35-37). As such the learning experience of the individual "does not go on simply inside the person, […] but changes in some degree the objective conditions under which experiences are had" (Dewey 1938, 39). Educative growth through learning is thus not simply a subjective function of direct personal reflection by the individual as a separate experience of self-as-was a moment ago (Mead, 1934)

to which the self-as-now reacts. Rather, it has an objective character communicated in action towards others, the datum to which those others each respond. These responses, in their turn, are objective reflections of new subjective experiences of learning. In this way, the philosopher-manager educates others through his actions, which are a result of his own learning.

The continuation, pervasiveness and importance of learning in and across managerial situations therefore arises from the creative urge that transcends the actual occasion such that, upon concrescence, it is immediately part of the universe of entities which affect the concrescence of future managerial occasions. Thus, the dynamism that is the learning experience arises from the continuing creativity of new learning occasions. When viewed as the mechanism by which individual managers act in organizations, organizational growth and development—be this in terms of the daily practice of management or the establishment of longer term strategic policy—is a function of this learning process.

8. Relating Individual Experience to Organization

Two questions follow from such a rendering. First, how does each individual managerial experience precisely relate to the business corporation or organization? Second, how can we reconcile the two very different levels of analysis of individual manager and organization (*cf*. Cooper above), and thereby unpack in process terms the mechanism by which managerial learning may transfer itself into the intellectual (and economic) growth of the business?

One answer is to suggest from a technical perspective that it can not. A core problem for writers in management and organization studies, as we have already seen, is the unit of analysis; human agents, organizations and the like are the requisite focus of attention in the field whereas, for Whitehead, these are at best once-removed abstraction. For Whitehead, organizations are not *res verae*. Here at once lies an indication of the error of the social scientist. Since in process thought only those things that do not endure subjectively beyond the moment of their becoming really exist, the fundamental unit of analysis for the management social scientist—the enduring society that is the organization—is nothing but an epistemological phantom that contravenes the speculative metaphysician's ontological principle of "togetherness in the formal constitution of an [individual] actuality" (*PR* 32).

This is recognized in part by Clegg *et al* (2005), who use Whitehead to argue organizations not as "one of the final real things of the which the world is made up" (*PR* 27), but rather as a "combination of indivisible processes located (and in flux) through space and time and related to each other" (Clegg *et al*, 2005). Rather than existing, they argue, an organization is the "momentary apprehension of an ongoing process of organizing that never results in an actual entity." In this sense, they suggest the fallacy of considering an organization as a concrete "thing" thus "consists of neglecting the degree of abstraction involved when an actual entity is considered merely so far as it exemplifies certain categories of thought" (*PR* 11). The implications of this Whiteheadian insight for either organization studies as a field of research, or for our practical appreciation of organizations as we experience them, however, are left unexplored.

Nevertheless, a more complete application of Whiteheadian thinking does allow us to explore such implications, by way of postulating a second answer to the questions posed above. The transfer of managerial learning discussed above into the organization can be understood as the inter-relation between occasions and the progressive layers of social order into which they are organized within the business. Certainly an organization in Whiteheadian terms is not a subject of experience as it is not able to make a "decision" with respect to its self-continuation. Yet it does possess "causal laws which dominate the social environment […] and is only efficient through [the actions of] its individual members" (*PR* 90ff; in Bracken 1989)—actions which, as D'Arcy and Dibben have sought to demonstrate (2005), are the result of process-thinking and learning.

Furthermore, the members of the organization can only function as a part of it "by reason of the laws which dominate [it], and the laws only come into being by reason of the analogous characters of the members of the society" (Bracken, 1989). These laws, or policies, procedures and recommendations—such as those discussed above—are in and of themselves a manifestation of managerial learning. In this sense, therefore, a business organization may be thought of as an energy-field, perhaps analogous to a particular kind of extensive continuum, "progressively shaped and ordered by successive generations of [e.g. managerial learning] occasions, so that it effectively serves as the medium for the transmission both of physical feelings and of conceptual patterns from one generation [of, perhaps, managers and/or workers?]… to another" (Bracken 1989, 155). This rendering certainly emphasizes the process-thinking manager's connection with the human life experience of synthesis demonstrated, for example, in the foregoing discussion of trust development. Nevertheless, it subscribes also to a disputed argument that Whiteheadian societies are structured fields of activity that are both objectively real and progressively structured by the events taking place within them (*cf.* Bracken, 2002, 2004).

9. Furthering a Whiteheadian Understanding of Management and Organization

How might such a "field-oriented" rendering be developed so as to further our understanding of management and organization? The first step is to unravel the process-philosophical detail. It would include but by no means be limited to the problems of prehension, tri-modal perception—and in particular the extent to which an event field may be inherently causally efficacious—and what we may term in a general way the problem of continuity within change that a more active event field postulate opens up. Further, we may be forced to ask some fundamental questions, both from a philosophical and a practitioner-oriented perspective. What does an active event field mean for our understanding of Whiteheadian process thought? What does this say for our understanding of Whiteheadian societies, let alone macro societies or social entities and our relations both "to" and "with" them?

A number of implications arise, both for our approach as process thinkers to the social sciences, and for social scientific approaches to the nature of the realities they seek to

understand, should Joseph Bracken's thesis concerning event fields prove to be demonstrably applicable to contemporary reality. It would, for example, become appropriate to "recognize" social entities as real—they patently are since we at the very least "inhabit" them conceptually. If this is possible within process metaphysics (i.e. within the speculative schema of *Process and Reality*, as opposed to the scientific schema of *Science and the Modern World*), the bridge between Whitehead the philosopher of science and Whitehead the metaphysician would be rendered more explicit. It might then be possible to make more use of his early writings on "the organisation of thought," his 1916 Presidential Address to the British Association for the Advancement of Science, in which a number of his later metaphysical concepts are discussed in what amounts to the beginnings of a process epistemology of experience, as related to the science of physics and the logic and geometry of mathematics.

It would also be possible to consider social entities, such as organizations, as societies in a Whiteheadian manner more constructively than has perhaps been the case hitherto. This is because it would allow a substantive definition of societies as *res verae* that *retained* the Whiteheadian appreciation that (1) the production of social continuity is a function of the transmission of its defining characteristic; and at the same time, (2) the entity makes a decision in its completion about just exactly how that defining characteristic will be appropriated from the social environment into the unitary reality of its individual actuality *causa sui*.

As a result, we would no longer need merely to circumvent the noun (organization) and reinvent it as a verb (organizing). Rather, we may be able to address the noun head-on and at the same time not fall foul of the host of fallacies this has traditionally led us into. It would allow us to extend Cooper's thinking on relations discussed above by suggesting that the complex enduring pattern we call an organization somehow selects those aspects of both its environments and its parts that are relevant for its functioning and lends its own aspects to what it draws together in its own limitation.[9] Further, we would be able to take better account of the effect of the negative intuitive judgment (*PR* 273) not only on the concrescing entity but on the capability of the society (/organization) to endure as a result of the continuing conscious discrimination of successions of higher occasions of experience.

In short, we may be able to address ourselves more readily and comprehensively to questions the sciences and social sciences concern themselves with directly. Questions that we have so far tended to dismiss as falling foul of the fallacies of misplaced concreteness, simple location and direct (i.e. without an awareness of causal efficacy and presentational immediacy) symbolic reference. Lastly, we might extend Cooper's and Wood's arguments regarding the qualitative study of boundaries and interspaces by applying Whitehead's theories of, amongst others, "extensive abstraction," "congruence" (*CN*) and "extension" (*PR*) to consider in detail what Michel Weber has described as "pointless qualities" (Weber, 2006).[10] In this way, we would also be able to broaden possible research into the Whiteheadian nature and organization of virtuality in information systems, as "the geometrical behavior of space in which one or more of the coordinates are imaginary" (Dibben and Panteli, 2003), to general explanations of organization.

10. Conclusion: Moving beyond Beginnings

> Science is either an important statement of systematic theory correlating observations of a common world, or is the daydream of a solitary intelligence with a taste for the daydream of publication. But it is not philosophy to vacillate from one point of view to the other (*PR* 329).

Although the focus of Whitehead's thinking was largely elsewhere, he did turn his attention to management issues in terms of business education. In recent years, this work has been developed by a number of writers in management and organization studies to include a variety of topics, from management knowledge, learning and decision making to organization theory and analysis. This literature is noteworthy for its selective application of specific elements of Whitehead's thinking, notably that regarding Simple Location and Misplaced Concreteness to explore particular aspects of management of concern to it. Such use has gained substantive currency, largely as a result of the analysis of organization undertaken by the academic and consultant Robert Chia, to the extent that special workshops and conference tracks on process thought in organization studies are now commonplace at academic conferences in the field.

The work presented therein is, however, characterized by a stylistic tendency to use a wide range of philosophers in concert, such as Merleau-Ponty, Bergson, James, Deleuze, Foucault, Derrida and Nietzsche—as well as occasional references to Whitehead—to develop a general process-oriented discourse. This is because at the general level in which they are used, there are apparently obvious similarities among these philosophers—even if a more in-depth analysis would perhaps place greater emphasis upon the differences between them. As a result, we find comparatively little evidence of a thoroughgoing use of a Whiteheadian process relational philosophy but, rather, arguably a less than complete rendering of the influence of process in management and organizational life. In this sense, and despite the considerable scholarship of a number of writers, notably Chia and Wood, we may conclude that the field has not advanced either in style or substance far beyond Cooper's original 1976 "Open Field" article.

Worse, because the literature neither fully applies Whitehead's thought, nor fully explores the implications of a Whiteheadian analysis to its topics of study, it often displays at best a sketchy grasp of his philosophy. A growing characteristic is the reliance upon secondary citation of recognized management and organization studies scholars, notably Chia, who cite Whitehead and other process philosophers; understanding of core process issues is consequently limited by abridgment of the abridgers.[11] Furthermore, even among recognized authorities in the field who may be said to engage in detailed study of at least some of Whitehead's primary literature, there is little evidence of the use of his secondary literatures; rarely are works noted within process studies as providing accurate explications of Whitehead's thought such as those of Cobb, Griffin, Hartshorne or Sherbourne ever referred to, much less considered in depth. As a result, errors of interpretation are easily made, and promulgated.

These errors are partly a function, also, of process thinking in management and organization studies having its basis in deconstruction, or deconstructive postmodernism, as opposed to constructive postmodernism. Renderings in management and organization studies of the deconstructive postmodernisms of Derrida (Cooper, 1989), Foucault (Cooper and Burrell, 1989) and others seek to overcome "the modern worldview through an antiworldview [that]

deconstructs or eliminates the ingredients necessary for a worldview, such as God, self, purpose, meaning, a real world, and truth as correspondence" (Griffin, 1993). Put bluntly, therefore, deconstruction—"organizational analysis as deconstructive practice" (Chia, 1996b and 1994; *cf*. Cooper, 1987, 1989 and Cooper and Burrell, 1988, 1989), the premise for an application of Whitehead in management and organization studies, holds to an implicit purpose and worldview that is the precise opposite to that of Whiteheadian thinking (*cf*. Gare 2000, 2001).

Constructive or revisionary postmodernism as espoused by Peirce, James, Bergson, Whitehead and Hartshorne, on the other hand seeks to unify scientific, aesthetic and religious institutions in order to overcome the modern worldview. This is because, in contrast to deconstructive postmodernism, constructive postmodernism provides a more complete rendering of our experience as a result of its return to organicism through a *creative synthesis* of both premodern and modern truths and values that, crucially, brings with it an acceptance of non-sensory perception (Griffin, 1993).

We might, therefore, dismiss the use of Whitehead's thought (and more generically perhaps, that of a range of other philosophers) in management and organization studies as the expedient development of an inappropriately based discourse that amounts to little more than "intellectual hop-skotch," a "recipe book" of "sound-bite philosophy" that is itself, ironically, delightful to read, easy to comprehend, and unavoidably incomplete. On the other hand, we might remind ourselves not only that the main focus for management and organization studies scholars is of course *not* philosophy, but also that management and organization studies scholars are ultimately working in a discipline that is fundamentally constrained in two ways. First, the discipline is not appreciative of advances in physics that understand and model reality 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, 176; *cf*. Cahill, 2005). It is thus not yet capable of appreciating Whitehead's notions of panexperientialism, let alone God.[12] Second, it expects not depth of primary citation, i.e. the exhaustive and detailed analysis of the works of an individual philosopher, but rather the precise opposite—mere breadth of (largely deconstructive postmodern) secondary citation. Indeed, it apparently regards such breadth as evidence an author has mastered the philosophy he or she cites.

Furthermore, we might also remind ourselves that Whitehead's philosophy was not intended to provide for explanations of business organizations as a primary unit of analysis and, thus, a considerable amount of interpretation is required to put it to use in the field. This, when coupled with the very limited amount of primary source material from Whitehead himself on management upon which to base such work, compels the final conclusion that, even bearing in mind its numerous philosophical limitations, the advances in understanding made by management and organization scholars using Whitehead's thinking, and touched upon in this brief review, represent a remarkable achievement.

As such, the current level of understanding and application of Whitehead's thinking in management and organization studies can perhaps best be described as a substantive starting point from which further insight may be developed. Moving beyond this beginning requires the range of core principles of Whitehead's thought to be brought to bear upon the topics to be