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Michel Weber

Whitehead's Pancreativism

The Basics

Foreword by Nicholas Rescher



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To Celeste, ad deam qui laetificat juvenum meam.

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Abbreviations

- AE:** *The Aims of Education*, 1929 (Free Press, 1967).ⁱ
- AI:** *Adventures of Ideas*, 1933 (Free Press, 1967).
- CN:** *The Concept of Nature*, 1920 (Cambridge U. Press, 1964).
- D:** *Dialogues, as Recorded by L. Price*, 1954 (Mentor Book, 1956).
- ESP:** *Essays in Science and Philosophy*, Philosophical Library, 1947.
- FR:** *The Function of Reason*, 1929 (Beacon Press, 1958).
- IM:** *An Introduction to Mathematics*, 1911 (Oxford U. Press, 1948).
- MT:** *Modes of Thought*, 1938 (Free Press, 1968).
- OT:** *The Organisation of Thought*, Williams and Norgate, 1917.
- PM:** *Principia Mathematica*, 1910-1913; sec. ed.: Cambridge U. Press, 1925-1927.
- PNK:** *An Enquiry Concerning the Principles of Natural Knowledge*, 1919/1925 (Dover, 1982).
- PR:** *Process and Reality*, 1929 (Free Press Corrected edition, 1978).
- R:** *The Principle of Relativity*, Cambridge U. Press, 1922.
- RM:** *Religion in the Making*, Macmillan, 1926.
- S:** *Symbolism, Its Meaning and Effect*, Macmillan, 1927.
- SMW:** *Science and the Modern World*, 1925 (Free Press, 1967).
- UA:** *A Treatise on Universal Algebra*, Cambridge U. Press, 1898.

ⁱ When the edition used differs from the original one, it is mentioned between brackets. The full references are given in the Bibliography.

Foreword

Nicholas Rescher

In the years following the end of the first World War, A. N. Whitehead transformed himself from a fine mathematician to a superb philosopher—one of the seminal figures of XXth century thought. Drawing on many sources of inspiration he devised one of the very few substantial systems of original philosophical thought to which that century gave rise.

Regrettably, however, two considerable obstacles obtruded against Whitehead's exerting the philosophical influence that his systemic reflections deserved, one internal and self-created, the other external and created by envioning circumstances.

The self-engendered difficulty laid in Whitehead's mathematico-scientific mentality which led him to deem it necessary to expound his thought through a technical terminology purpose-fitted to the original and creative tendency of his ideas. The second, circumstantially engendered, difficulty was that Whitehead's philosophical work came upon the scene at a time when philosophers were disillusioned with big-picture thinking and instead favoured thinking narrowly (even if deeply) about matters of detail.

So on the one hand, Whitehead lacked the expository facility of an author like Bergson who was able to render abstract ideas accessible in vivid and readily graspable nontechnical prose. And on the other, the intellectual ethos of the day rendered many and most creative philosophers unwilling to devote the time and effort required for entry into Whitehead's thought-world. The combination of these two factors—difficult writings and uncongenial methods—served to limit the influence of Whitehead to a relatively small band of devoted followers and deprived it of the greater impact on the wider community of philosophers that its inherent merits amply warrant.

But now at long last, a half-century after his death, the winds have shifted and the clouds have begun to dissipate. Philosophers no longer see a need to restrict themselves to matters of detail and are rediscovering the value and allure of big-picture thinking. Moreover the patient labours of

Whitehead's devotees has borne fruit in a series of studies of Whiteheadian ideas and issues that render the master's work more readily accessible to uninitiated outsiders. In consequence, a Whitehead renaissance is in progress which is gradually spreading around the globe and which promises to assure his reputation not only as one of the greats of his day but also as a major influence upon subsequent philosophizing.

It is in just this regard that Michel Weber's book stands out as significantly productive. On the one hand, it represents an effect of the growing interests in Whitehead's work that characterizes the present scene. On the other hand, in helping to make that work conveniently and accurately accessible it will doubtless prove to be a causally efficacious conduit through which Whitehead's ideas will exert greater influence in the philosophical scene.

The object of *Whitehead's Pancreativism* is to highlight Whitehead's relevance to the perennial concerns of speculative philosophy and to facilitate access to it for those living in the philosophical atmosphere of the present day. And in this aspiration the book succeeds wonderfully well. For the many-sidedly prismatic nature of Whitehead's sources of information and inspiration make his thought both immensely stimulating and nevertheless rather difficult of access, and just here Michel Weber's book proves its sterling worth.

By any reasonable standard Whitehead's philosophical *œuvre* is at once a treasure and a challenge. In bringing that treasure into clearer view and in easing the way to meeting this challenge Michel Weber's *Whitehead's Pancreativism* makes an important contribution not only to Whiteheadian scholarship but to *Philosophia Perennis* as well.

Nicholas Rescher
Pittsburgh Pennsylvania
May 2006

Introduction

There is one very simple question that any potential reader who suspects that Alfred North Whitehead (1861–1947) might be important for past, contemporary, and future philosophy inevitably raises: how should I read Whitehead? How can I make sense of this incredibly dense tissue of imaginative systematizing, spread over decades of work in disciplines so different and specialized as algebra, geometry, logic, relativistic physics and philosophy of science?

As soon as he arrived in Harvard, Whitehead furthermore proposed, to his no doubt amazed audience, reflections on a new foundational philosophy that is both historically and speculatively impressive and touches on the necessary interplay between science, philosophy and religion. In a few months, the horizon of his speculations embraced metaphysics and natural theology, exactly in an epoch when they were highly suspect for the intelligentsia. Worse again: the philosopher did not even claim to have achieved a definitive system worthy of that name, only “the most likely story” that, in its turn, will inevitably suffer a deposition. The mind boggles!

It is the purpose of this monograph to propose a set of highly efficient hermeneutical tools to get the reader started. These straightforward tools provide answers that are coherent and probably the most applicable to Whitehead’s entire corpus. Of course, the way the problems are sorted strictly reflects the writer’s own fresh understanding of these issues, but a long acquaintance with the primary literature gives to this proposal a very significant comparative advantage over past interpretative attempts (even—especially—the holistic ones). It is not by mistake after all that Whitehead has *not* been recognized so far as one of the most potent historical figures of Western science and philosophy. The British scholar will speak to the reader only if she attempts to welcome his *entire* legacy. To do so necessitates of course a peculiar state of mind that is, or is not, given. As a matter of fact, this peculiarity amounts to a temperamental difference that leads some to Whitehead and others to Russell or even Wittgenstein... (Please note that this temperamental discriminative key is actually

advocated by Whitehead himself but also notably by, e.g., Nietzsche, Emerson, James, Cornford, Jung, Dewey, Russell and Poincaré.) To rephrase our bold claim: if your philosophical temperament lures you towards Whitehead, you will find material here to allow you to meet him in person. And that material has to be of course purely (and adventurously) conceptual: “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).

More precisely, the target will be *Process and Reality* (being the Gifford's Lectures of 1927-1928, that were delivered at the University of Edinburgh), universally recognized—even by those who either prefer to debate some other of Whitehead's works, or content themselves simply with the careful study of only one part of it—as his *magnum opus*. The book consists 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.” The First Part shelters the (in)famous “categorical scheme” that is, according to Whitehead himself, “practically unintelligible” when taken separately from the investigation of the entire book. Part Two (which is the weakest because of Whitehead's meagre knowledge of most philosophers he discusses) mainly studies the so-called classical philosophers of the ancient and early modern period and Kant from the perspective of its reformed subjectivism (see *infra* § III, 3.2). Part Three analyses “genetically” the coming into *existence* of new actualities; it is in a strictly conceptual way the densest. Part Four analyses “coordinate” the *being* of actualities (and defines straight lines without reference to measurement); it is the algebraic counterpart of genetic analysis and it is axiomatically the densest. Part Five reinterprets the ontological system so far adumbrated from the perspective of the God/World relationship which Whitehead undertakes to balance in a novel way. At first sight, its peculiar blend of Oriental complementarism (or relativism) and Occidental theism will seem familiar—but at first sight only: the interpreter has to be exceptionally cautious on these tarnished shores. All the more so since the law of excluded middle has so far applied to Whiteheadian theological scholarship: either the philosopher is read from the religious perspective of a given denomination, or one tries to extirpate any signs of theism or deism in his system.

It is well known indeed that the hurried reader (or the average Whiteheadian) is satisfied (or at least pretends to be) to read only the first and last Parts of *Process and Reality*, that can, as a matter of fact, be made understandable from an alien (or exoteric) perspective (i.e., meaning does

not spring from the texts themselves, it is conjectured or even injected from a particular philosophical standpoint). This does not constitute, strictly speaking, a philosophical handicap: depending on the reader, it can prove to have a very rare educational virtue, shared with only few XXth century's texts (one thinks here, for example, of the multiple entries to Arendt's *Life of the Mind*). Similarly, another main phalanx of Whiteheadians—the ones only interested in his logico-geometrical (or mereo-topological) inquiries—will be satisfied with the fourth Part, whose technical linearity undoubtedly facilitates its understanding (algebraical findings and defaults, when they exist, are made obvious by the axiomatic exposition). The ones with an historical propensity prefer to haunt Part II, while the most speculatively daring scholars invest in Part III, which requires a total conceptual immersion. Momentous technical progress has been made with the help of such a reductionistic compartmentalization, but it is *not* sufficient to understand Whitehead *secundum* Whitehead. The rule of such interpretations is *murder to dissect*; the motive and weapon used differ according to the temperament of the reader. There is, as a result, not only room but need for a new global attempt to interpret PR and accordingly to reassess the entire Whiteheadian legacy.

In sum, the first point to be clarified is that—at the very least from the perspective of Whitehead's lasting philosophical significance—PR is the acme of his works. Before PR, he is still looking for his ontological categories; after PR, he adopts (usually for the better, but sometimes for the worst) a popularization stance. There remain of course room for cross-elucidation, especially between the works of the core trilogy SMW / PR / AI, but this developmental comparative path should not be overestimated. It certainly cannot make the economy of addressing the two pitfalls identified by Merleau-Ponty in his “In Praise of Philosophy”: firstly the retrospective illusion, which leads us “to see in a past event the preparation of our present—whereas this present was a “complete act” in itself”—and secondly the teleological prospective, i.e., the “retroactive effect of the truth [l'effet rétroactif du vrai].”¹ Exegesis and contextualization of a given work are thus trapped within a twofold constraint. On the one hand, as the Greeks understood very clearly, one needs to dare to have a holistic interpretation; on the other, one ought not to obliterate the creative advance of the debated author. In any case, the complementarity Whitehead is himself advocating between, on the one hand, PNK, CN and R, and, on the other hand, SMW, PR and AI does not compromise PR's perihelion—on the contrary.

The second point is to understand PR as a whole and hence to devise appropriate (heuristic) hermeneutical tools. Again: one should start on the

assumption that PR *does* make sense as a whole, not that it is a clumsy patchwork—even if it might look like one to the hurried reader. In conversation with Johnston, Whitehead has claimed “Don’t hesitate to criticize. There are contradictions. Mine is not a final and complete system.”² Such contradictions are nevertheless exceptional and rather easy to fix from a holistic perspective. Moreover, logical *contradictions* are not really problematic for the late Whitehead: what matters is making sure that the system is *coherent*.

The third point is to realize that PR’s entire argument revolves around an invisible centre of gravity: the intended synergy between Part III and Part IV, clearly announced in PR xii-xiii,³ and which amounts to the meshing of the Category of the Ultimate with the relation of extensive connection, i.e., basically, to the activation of the togetherness between genetic and coordinate analysis, concrescence and transition, existence and being, becoming and perishing, actuality and potentiality, subjectivity and objectivity, present and past, qualities and quantities... And this overwhelming fact alone explains probably why the philosopher has been so drastically misunderstood even by specialists: besides John B. Cobb, Jr., Wolfe Mays, Donald W. Sherburne and especially Jorge Luis Nobo, nobody has really considered this barycentre close enough.⁴ Even excellent scholars, both speculatively *and* analytically inclined (and these two propensities are indeed required to make sense of PR), consider that Part IV is nothing but a meteoric incongruity landing there straight from a draft of the fourth volume of the *Principia Mathematica*, which never got published and was supposed to be written by Whitehead alone, and does not fit with the process view Whitehead is advancing in PR. (On the top of it, one has to deplore in this context UA’s oblivion.)

However, the aim of the present monograph is not to give rise to new modes of old (or unprecedented) quarrels. Provided that one sincerely aim at avoiding any form of dogmatism, something that furthermore appears to be completely antinomical with the philosophical wager, it is obvious enough that in a pluralistic “open universe” there is room for complementary—or even antagonistic—approaches. The quest for the Arcanum of PR—to repeat: as manifested in the *togetherness* of Parts III and IV—requires another standpoint altogether. Besides, it will be appropriate to adopt the Whiteheadian style itself, which is basically a matter of circumambulation, as Whitehead himself makes plain in his philosophy of education works. Before clarifying this essential stylistic matter, a quick overview of our argument and a few prolegomena are in order.

A first quick anticipative synthesis is advisable in order to specify an essential point (that, as Whitehead would say, should be fully understandable only at the end of our argument). The Ultimate can be approximated in Whitehead's organicism by the concept of creativity that names all types of actualities, virtualities and potentialities, neither existing independently of its mundane and divine accidents, which are named *actual occasions* or *actual entities*⁵: by definition, nothing escapes its grip. For its part, the concept of actual occasion has two fundamental valencies. The actuality-subject is the actuality *per se*; the actuality-object constitutes the primordial form of potentiality (which does *not* mean that it is only vicariously actual).⁶ To tell the truth, the secret of the Whiteheadian ontological reform is quite simple: the actuality-subject grows, concretes, at the edges of the World—*beyond the bounds of the world*—, buttressing itself on the determinism materialized by the actualities-object. “When” its organic growth is terminated, it topples into objectivity and becomes an actuality-object fully integrated in the mundane plenum. In order to manifest the intrinsic power of the actuality-object, PR also speaks of *superject*. The ultimate ontological scansion or rhythm is thus the following: objects / subject / objects / subject... In categoreal terms (and from the perspective of one single trajectory of events that accounts for the antique *substance*): Many / One / Many / One. “The many become one, and are increased by one” says the Category of the Ultimate (PR 21). This means that the past Many do not simply coalesce, merging into a new actuality: the new actuality goes beyond a simple fusion, synthesis or arrangement (see *infra* our contrast between meta-morphosis and hylo-genesis: §§ I, 2.2 and VI, 1). In metaphorical terms: “The creativity of the world is the throbbing emotion of the past hurling itself into a new transcendent fact. It is the flying dart, of which Lucretius speaks, hurled beyond the bounds of the world.” (AI 177; cf. our Jamesian quote in section I, 2.2; the metaphor of the inflating balloon used in Big Bang cosmologies—and, as such, to be manipulated with great care—offers an intuitive picture of this cosmo-genesis.)

Hence two immediate corollaries that account for the fact that we speak of the *edges* of the World: in the first place, *existence*, actuality in the strong sense of the term—i.e., subjectivity as redefined by Whitehead independently of conscious experience (strictly speaking, he is not a panpsychist)—takes place in an immediate present that does not belong to physical temporality and to its deterministic order. It belongs instead to the durational temporality that has been eminently explored by Bergson and James. Consequently, *being*, i.e., the World, is always already potential, past, determined, temporalized. In the second place, in the case of what Whitehead names high-grade actualities, the normal state of consciousness

allows only a direct access to past data and their projection in the present (their presentification). *In consciousness-zero* (term that will be used to avoid using expressions such as “the so-called normal state of consciousness” and in order to suggest the *unconscious* existence of a continuous scale—or chain—of states of consciousness), *we live in the past*; the present can be prehended only in a flash.

To make this picture vivid, our monograph proposes the following circumambulative seven steps.⁷

First, the historical introduction examines Whitehead's life and works together with his legacy. It argues that there is *contiguity* in his works. On the one hand, they display a significant double continuity (of matter and form): all his life, Whitehead kept a steady interest in extension and relationality while his philosophical temperament remained stable as well. On the other, Whitehead gradually shifted his focus during his spiritual journey: he has contemplated the logico-mathematical field *sub specie totalitatis* in Cambridge, geometry as a physical science in London, and metaphysics under the category of creativity in Harvard. By the same token, he has gently shifted from the concept of extension, to the concept of extensive abstraction and finally to the creative relation of extensive connection. By contiguism we thus signify the necessity to envision both the continuity and the discontinuity in his works. Besides, the same important claim will be made with regard to his ontology, which promotes both continuity (potentiality and extension) and discontinuity (actuality and intension, i.e., epochality). The Aristotelian question—can a continuum be composed of indivisibles?—receives here a forthright answer. With regard to his legacy, we especially peruse Rescher's *Process Metaphysics* in order to adumbrate the path-breaking dialogue between two encyclopaedic minds.

Second, the intertwining of science, philosophy and religion—a theme central to Whitehead's organicism—is carefully examined with the help of a nested set of concepts specifying each field, each one being partitioned into a pre-rational, rational and post-rational territory. Thereby we secure the independence and the interdependence of each field in an evolutive context.

The chapter on PR's Goal and Method insists firstly on the existential virtue of the Whiteheadian philosophical gesture. It then clarifies the intrinsic value of each of the five criteria circumscribing speculative philosophy in order to allow the definition of PR's systematic goal. The aimed product being cleared up, the input remains to be defined: the sections on Radical Empiricism and on the Reformed Subjectivist Principle achieve this and occasion a discussion of the philosophical methods (in the

broad sense of the word) Whitehead promotes, i.e., the method of difference and the method of imaginative generalization. Last but not least, we examine the stylistic issue with the help of the concepts of circumambulation, constructive discrimination, polysemiality and interanimation.

The unfoldment of the Creative Advance is consequently proposed with the help of three main threads: the Gift of Creativity, the Power of Efficacy, and the Bliss of Vision. The directionality creativity (that will also be named “innovation”) urges—and efficacy (or “novation”) settles—is locked by a form of teleological claim: there is a built-in upward trend in Whitehead’s system. Within the unison of their immediacies, God and the World sustain each other in the quest for higher intensities. From this elementary standpoint, we gradually raise, through the examination of the Category of the Ultimate and of its four principles, to the analysis of the interlocking of the three main conceptual bipolars weaving PR’s categorial scheme: Atomism & Continuity, Liberty & Determinism, Duration & Time. The concept of percolation will be instrumental in sharpening these bipolars without diving into a genetic or coordinate analysis.

A first application of this train of thought is proposed by raising the question of the abolition of the category of conceptual reversion. We argue that none of the two so-called shifts in Whitehead’s philosophy—the shift to ontological atomism and the abolition of the category of conceptual reversion—are actual. On the one hand, Whitehead does not shift from a continuist ontology to a discontinuist ontology since he has very explicitly refused to venture himself in the ontological territory before his adoption of ontological *atomism*. He drifted from a continuist phenomenology making no ontological hypothesis (*hypotheses non fingo*) to a contiguist ontology articulating epochs in a continuum and thereby giving ontological depth to his continuist phenomenology. The former could be said to belong to a “formal ontology,” the latter embraces the full experiential concreteness, it constitutes a genuine “existential ontology.”⁸ On the other hand, the category of reversion is nothing less than essential to understand how his system tackles the key issue of genuine novelty.

The meaning and significance of Whitehead’s pancreativism are examined after some reflections on the historical unfoldment of the concept of creativity in the works of his Harvard period. The bulk of the interpretation rests upon a heuristic chart that carefully systematizes all the occurrences of the concept of “creativity” in PR. First of all, mother-creativity is *dipneumonous*: God and the World constitute the two specular loci of the creative rhythm. Second, mother-creativity is *bifunctional*: on the one hand, it is *agent*, fundamental inclination towards novelty; on the

other, it is *reticular*, partial goals, i.e., it is instantiated in actualities-subject (including the consequent nature) and characterised in actualities-object (including the primordial nature).

The last chapter re-examines PR's pancreativism from the complementary standpoint of the question of the intricacy of the layers of actuality and of potentiality. It is Whitehead's perennial claim that the primacy of process (be it the process of concrescence or the process of transition) has to be envisioned in dialogue with forms of uniformity.

Eventually, we conclude with some reflections on philosophy as the mastering of rationality. Further exemplifications of the heuristic trend embodied here will take place in the sequel to this volume: *A. N. Whitehead's Pancreativism. Jamesean Applications*, to appear in the near future. As a matter of fact, there is a *mysterium conjunctionis* between the British and the American thinkers that has been so far only dimly unveiled in scholarship (with the notable exception of Eisendrath, Capek, Lowe and Wahl⁹): although they were of a completely different philosophical temperament (James being obviously rather experimentally empiricist while Whitehead was more an imaginative empiricist), they basically shared the same organicist founding intuition. Their respective radical empiricisms (a pluralism of interconnected events) and formalist propensities developed according to complementary trajectories that require so to speak an inquiry into the separation and the synthesis of psychic opposites.¹⁰

"His thinking is a prism", confided Mrs. Whitehead in Lucien Price's *Dialogues* (p. 16). And the only way to reconstruct the unicity of the incident light after its prismatic decomposition is to use another prism. It is such a tool that is provided here in an explicitly youthful Whiteheadian spirit: "panic of error is the death of progress; and love of truth is its safeguard." (MT 16; cf. AE 119)¹¹

Notes

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¹ Maurice Merleau-Ponty, *Éloge de la philosophie* [Leçon inaugurale au Collège de France, 15 janvier 1953] *et autres essais*, Paris, NRF Éditions Gallimard, Bibliothèque des Idées, 1953, respectively p. 34 and p. 37. (*In Praise of Philosophy*. Translated, with a Preface, by John Wild and James M. Edie, Northwestern University Press, 1963.)

² Allison Heartz Johnson, “Whitehead as Teacher and Philosopher”, *Philosophy and Phenomenological Research*, vol. 29, 1968-1969, pp. 351-376, p. 352. Other memories of Whitehead include the following important sources (besides the *Dialogues of A. N. Whitehead* and Russell’s *Portraits from Memory*): William Ernest Hocking, “Whitehead as I Knew Him” (*Journal of Philosophy*, 58, 1961, pp. 505-516); Joseph Gerard Brennan, “Whitehead on Plato’s Cosmology” (*Journal of the History of Philosophy*, 9, 1971, pp. 67-78) and “Whitehead on Time and Endurance” (*Southern Journal of Philosophy*, 12, N° 1, 1974, pp. 117-126); Paul Weiss (as interviewed by Lewis S. Ford), “Recollections of Alfred North Whitehead” (*Process Studies*, 10/1-2, 1980, pp. 44-56). See also Victor Augustus Lowe, “Whitehead’s Gifford Lectures” (*The Southern Journal of Philosophy*, VII, 1969, pp. 329-338); Douglas P. Lackey, “The Whitehead Correspondence” (*Russell* 5, 1972, pp. 14-16) and Brian P. Hendley, “In Search of the Elusive Whitehead : A Cautionary Tale” (*Process Studies* 31/2, 2002, pp. 51-63).

³ “In the third and fourth parts, the cosmological scheme is developed in terms of its own categoreal notions, and without much regard to other systems of thought. [...] The unity of treatment is to be looked for in the gradual development of the scheme, in meaning and in relevance, and not in the successive treatment of particular topics.” (PR xii) The togetherness of the two parts is exemplified a few paragraphs later: “The positive doctrine of these lectures is concerned with the becoming, the being, and the relatedness of ‘actual entities.’ [...] In these lectures ‘relatedness’ is dominant over ‘quality.’ All relatedness has its

foundation in the relatedness of actualities; and such relatedness is wholly concerned with the appropriation of the dead by the living—that is to say, with ‘objective immortality’ whereby what is divested of its own living immediacy becomes a real component in other living-immediacies of becoming. This is the doctrine that the creative advance of the world is the becoming, the perishing, and the objective immortalities of those things which jointly constitute stubborn fact.” (PR xiii-xiv)

⁴ See the bibliographic data accompanying our argument; in the meanwhile, the following works should already be mentioned: John B. Cobb, Jr. and Donald W. Sherburne, “Regional Inclusion and the Extensive Continuum” (*Process Studies*, 2/4, 1972, pp. 277-95) and “Regional Inclusion and Psychological Physiology” (*Process Studies*, 3/1, 1973, pp. 27-40); Wolfe Mays, *Whitehead's Philosophy of Science and Metaphysics. An Introduction to His Thought*, The Hague, Martinus Nijhoff, 1977; Jorge Luis Nobo, *Whitehead's Metaphysics of Extension and Solidarity*, Albany, New York, State University of New York Press, 1986. For complementary references on Whiteheadian scholarship, see Barry A. Woodbridge's (ed.) *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 the four main websites currently devoted to A. N. Whitehead's thought and legacy: <www.ctr4process.org>; <www.alfred.north.whitehead.com>; <www.processstudies.org>; <<http://www.jhfc.duke.edu/jenkins/whitehead/resources.htm>>.

⁵ In other words, we do not distinguish the two concepts.

⁶ Besides the fact that this distinction is active *throughout* PR, it is particularly clear in lecture notes taken by George Bosworth Burch and edited by Dwight C. Stewart (“Whitehead's Harvard Lectures, 1926-1927”, *Process Studies*, 4/3, 1974, pp. 199-206). George Louis Kline has made a strong case for it in “Form, Concrescence and Concretum. A Neo-Whiteheadian Analysis” (first published in *The Southern Journal of Philosophy*, 7, 1969-1970, pp. 351-360 and substantially revised and enlarged in Lewis S. Ford & George L. Kline (eds.), *Explorations in Whitehead's Philosophy*, New York, Fordham University Press, 1983, pp. 104-146); Jorge Luis Nobo's “Transition in Whitehead: A Creative Process Distinct from Concrescence” (*International Philosophical Quarterly*, 19/3, 1979, pp. 265-283) and *Whitehead's Metaphysics of Extension and Solidarity* (*op. cit.*) follow close behind.

⁷ Our argument exploits freely and updates the following previously published material: “Alfred North Whitehead (1861–1947)”, in Mander, W. J. and Sell, A.

P. F. (Senior Editors), *Dictionary of Nineteenth-Century British Philosophers*, Bristol, Thoemmes Press, 2002, Vol. II, pp. 1236-1241; “Huaidehai de shijiansheng zhi sanceng genyuan” [“La triple racine de la temporalité whiteheadienne”, traduit en mandarin par Liu Shu-Min], in *Chang yu you: zhongwai zhexue de bijiao yu rongtong*, Volume VI, Feb. 2002, pp. 163-181; “Introduction—Process Metaphysics in Context”, in Michel Weber (ed.), *After Whitehead: Rescher on Process Metaphysics*, Frankfurt / Lancaster,ontos verlag, 2004, pp. 41-75; “L'aventure cosmo-théologique”, in François Beets, Michel Dupuis et Michel Weber (eds.), *Chromatiques whiteheadiennes I: Alfred North Whitehead. De l'algèbre universelle à la théologie naturelle*. Actes des Journées d'étude internationales tenues à l'Université de Liège les 11-12-13 octobre 2001, Frankfurt / Lancaster,ontos verlag, 2004, pp. 283-309; “Créativité et réversion conceptuelle” in Michel Weber (sous la direction de) et Diane d'Eprémèsnil (avec la collaboration de), *Chromatikon. Annuaire de la philosophie en procès—Yearbook of Philosophy in Process*, Louvain-la-Neuve, Presses universitaires de Louvain, 2005, pp. 159-174; “La virtualité en procès. Relativisation de l'acte et de la puissance chez A. N. Whitehead”, *Revue internationale de Philosophie*, vol. 61 n° 236, juin 2006, pp. 223-241.

- ⁸ The well-known contrast between formal logic and formal ontology is Husserlian (see his *Logische Untersuchungen* III, 1900-1901, that sketches a theory of part and whole), but it can be traced back to Aristotle and Grassmann, the later being of the highest Whiteheadian relevance. The founding idea of a formal ontology is to use formal methods to solve classical ontological problems.
- ⁹ Craig R. Eisendrath, *The Unifying Moment. The Psychological Philosophy of William James and Alfred North Whitehead*, Cambridge, Massachusetts, Harvard University Press, 1971 (reissued by toExcel in 1999); Milic Capek, *New Aspects of Time. Its Continuity and Novelities. Selected Papers in the Philosophy of Science*, Dordrecht, Kluwer Academic Publishers, Boston Studies in the Philosophy of Science, Volume 125, 1991; Victor Augustus Lowe, *Understanding Whitehead*, Baltimore, Maryland and London, The Johns Hopkins University Press, 1962 (that includes his earlier “William James and Whitehead's Doctrine of Prehensions”, *The Journal of Philosophy*, vol. 38, N° 5, 1941, pp. 113-126 and “The Influence of Bergson, James and Alexander on Whitehead”, *Journal of the History of Ideas*, Vol. 10, N° 2, 1949, pp. 267-296); Jean Wahl, *Les Philosophies pluralistes d'Angleterre et d'Amérique* [Thèse principale], Paris, Librairie Félix Alcan, 1920 and his *Vers le concret. Études d'histoire de la philosophie contemporaine. William James, Whitehead, Gabriel Marcel*. Avant-propos de Mathias Girel. Deuxième édition augmentée [Vrin, 1932], Paris, Librairie Philosophique J. Vrin, 2004. See also Marcus P. Ford,

“William James”, pp. 89-132 in David Ray Griffin (et al.), *Founders of Constructive Postmodern Philosophy. Peirce, James, Bergson, Whitehead, and Hartshorne*, Albany, New York, State University of New York Press, SUNY Series in Constructive Postmodern Thought, 1993; Leemon McHenry, *Whitehead and Bradley. A Comparative Analysis*, Albany, State University of New York Press, 1992 (that includes his “Bradley, James, and Whitehead on Relations”, *Journal of Speculative Philosophy*, 3, 1989, pp. 149 sq.); and Calvin O. Schrag, “Struktur der Erfahrung in der Philosophie von James und Whitehead”, *Zeitschrift für philosophische Forschung*, 23, 1969, pp. 479-494. More recently we find: Ralph Pred, *Onflow. Dynamics of Consciousness and Experience*, London and Cambridge, MIT Press, 2005.

¹⁰ C. G. Jung (unter Mitarbeit von Marie-Louise Von Franz), *Mysterium coniunctionis: Untersuchungen über die Trennung und Zusammensetzung der seelischen Gegensätze in der Alchemie* [1956], Translated by Richard Francis Carrington Hull as *Mysterium Coniunctionis. An Inquiry Into the Separation and the Synthesis of Psychic Opposites in Alchemy* (The Collected Works, Volume XIV). See especially his important remarks on active imagination in §§365, 404 and 412.

¹¹ AE 119 is quoted *infra* § III, 1. A related well-known Whiteheadian motto can be found in AI 244: “It is more important that a proposition be interesting than that it be true. This statement is almost a tautology. For the energy of operation of a proposition in an occasion of experience is its interest, and is its importance. But of course a true proposition is more apt to be interesting than a false one. Also action in accordance with the emotional lure of a proposition is more apt to be successful if the proposition be true. And apart from action, the contemplation of truth has an interest of its own. But, after all this explanation and qualification, it remains true that the importance of a proposition lies in its interest.”

I. Historico-Conceptual Context

The development of Whitehead's thought has occurred in a very complex historico-speculative context that needs to be recovered in order to appreciate Whitehead's writings. Thinkers are always immersed in a general cultural atmosphere that is not necessarily (and does not need to be) objectified, made manifest in their works. In the case of geniuses, variegated influences are always melted down in the high-furnace of their minds. Besides the well-known impact of the theories of relativity (Einstein 1905 and 1915—but also Minkowski, Poincaré and perhaps Mach) and of the emergent quantum mechanics (Planck 1900 and Einstein 1905 synthesized in Bohr's atomic model of 1913), the importance of biological science, electromagnetism and psychical research in late Victorian England has to be underlined straight away.

Evolutionism had begun to impose its paradigm with Lamarck's (1744–1829) *Philosophie zoologique* (1809) and especially since Herbert Spencer's (1820–1903) *Principles of Psychology* (1855), but it gained momentum only with Charles Darwin's epoch-making (1809–1882) *Origin of Species* (1859) that, willy nilly, gave rise to theoretical eugenism.¹ His *upward trend of animal evolution* is embedded in Whitehead's vision (cf. especially FR). Louis Pasteur's (1822–1895) *Mémoire sur la fermentation lactique* (1857) reinforced the biologicalization of society and promoted the irruption of (biological) science in politics through his prestigious practical applications (the *Institut Pasteur* was inaugurated in 1888). Claude Bernard's (1813–1878) *Introduction à l'étude de la médecine expérimentale* (1865) had a twofold further ideological impact, namely the naturalization of life (the understanding of life from the vantage point of biological science) and the reinforcement of the old analogies of society and of organism (organs are not only specialized, they are also strictly correlated to each other).²

The concept of electromagnetic field—that we owe to Michael Faraday's (1791–1867) insight of 1846³ and that was axiomatized by James Clerk

Maxwell's (1831–1879) *Treatise on Electricity and Magnetism* (1873)—constitutes the second precious testimony against the theories of the bifurcation of nature. Needless to say, the concept of field is directly relevant to the special focus of this essay. L. P. Williams argues that Faraday has been mainly influenced in his conceptual creation by his correspondence with André-Marie Ampère (1775–1836), the reading of Roger Joseph Boscovich's (1711–1787) *Theoria philosophiæ naturalis* (1763) and an acute awareness of German *Nature Philosophy* through the poet Samuel Taylor Coleridge, who was personally acquainted with Humphry Davy (for whom Faraday was working at the Royal Institution of Great Britain).⁴ Faraday envisioned the universe as a “three-dimensional web of lines of force crisscrossing to infinity”;⁵ given these lines, Williams reasoned, the ether seemed an unnecessary hypothesis. The field curves were conceived as lines of *strain* or *tubes of forces*. In a sense an electric charge is everywhere, remarks Whitehead in CN 146.

The *Society for Psychical Research* was founded in 1882 by three dons of Trinity College: Edmund Gurney (1847–1888), Frederic William Henry Myers (1841–1901) and Henry Sidgwick (1838–1900).⁶ Lowe reminds us that “psychical research was almost a fad in Cambridge and London”, but does not exploit this important clue to put Whitehead's development into perspective.⁷ Since our second volume will examine this question, let us underline for the time being the central position of Myers' concept of *subliminal consciousness*, that has drawn the consequences from the two main psychological trends of the time: the scientific one, that tends to focus only on psychopathologies and their quantifications (Herbart, Weber, Fechner, Wundt and Richet, Charcot, Janet) and the existential one, that is opened to all experiences (Swedenborg, Schelling, Emerson, Schopenhauer, Nietzsche and Liébault, Bernheim, Forel) and as such is in dialogue with James' radical empiricism. The debated point was of course the correlation existing—or not—between hypnosis, suggestion and hysteria.

Whitehead is not the first outstanding philosopher to draw the consequences of these new scientific advances. Also to be mentioned are: Charles Sanders Peirce's (1839–1914) “How to Make Our Ideas Clear” (1878–9), William James' (1842–1910) works, from his *Principles of Psychology* (1890) to his *Essays in Radical Empiricism* (1912), Henri Bergson (1859–1941), especially with his *Évolution créatrice* (1907) and, last but not least, John Dewey's (1859–1952) *Influence of Darwin on Philosophy* (1910).

1. Whitehead's Life and Work

Born on 15 February 1861, at Ramsgate (Kent, U.K.) and deceased on 30 December 1947, at Cambridge (Massachusetts, United States), Whitehead entered Trinity College in 1880 with a scholarship in mathematics; in 1884, he was elected Fellow in Mathematics with a dissertation (now lost, but we can approximate its content by means of his first two *Quarterly Journal of Pure and Applied Mathematics* papers)⁸ on Maxwell's *Treatise on Electricity and Magnetism* 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 to University College London for a year and then to the Imperial College of Science and Technology (also in London), where he taught the same subjects until 1924, when he was invited to join the Philosophy Faculty of Harvard University. Emeritus in 1937, Whitehead continued to work at a slower pace until his death. 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 has wittily remarked that

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. With these assumptions a certain limited number of types of philosophic systems are possible, and this group of systems constitutes the philosophy of the epoch. (SMW 48; cf MT 12)

To become aware of such a set of (most probably unconsciously indeed) presupposed set of fundamental assumptions is the first necessary hermeneutical step. In the very same way Whitehead's mature ontology exploits the gearing of the continuous and discontinuous features of our experience, Whitehead's philosophical development is best understood as continuous (i.e., as the fruit of a rather stable philosophical temperament) *as well as* discontinuous (since it bears the stigmata of a shift of standpoint that is especially expressed in the adoption of an epochal theory of time introduced *infra*).

Accordingly, the development of his thought can be divided into three periods which placed emphasis respectively on logic (Cambridge, years 1880–1910), epistemology (London, years 1910–1924), and metaphysics (Harvard, years 1924–1947). The examination of these three “canonical” periods (with all due suspicion for stadial theories) reveals that Whitehead respectively contemplates (i) the logico-mathematical field *sub specie totalitatis*; (ii) geometry as a physical science; and (iii) metaphysics under the category of creativity. There is furthermore a common double thread to these three dimensions: the questions of (spatial) extension and of relationality.

Whitehead's philosophical development should be interpreted *qua* continuous from the perspective of the main characteristics of his philosophical temperament. His lasting philosophical outlook can be depicted in three steps. First of all, it is made up of a lasting *lure or vision*: Whitehead is animated by a constant archaeological (foundational, if you like) desire to question the meanings of “simple obvious statements” and to reorganise general ideas in order to attain higher orders of abstractions. Second, this lure is *bridled* by his sharp critical awareness of the limitations of language. This is so even for the reformed formal and conceptual language he proposes according to the targeted goal (algebraic, ontological...). In brief, Whitehead not only deplores the weakness of intuition and the deficiencies of language, he is also keen to identify the main fallacies involved (dogmatic fallacy, perfect dictionary and misplaced concreteness),⁹ to incriminate the syntax of the Indo-European languages, and especially to denounce its substantialistic interpretation of the subject/predicate pattern. This “destructive” movement is however complemented with a “constructive” one that sees him stretching everyday and philosophical languages “beyond their common meaning in the marketplace” (MT 12) to their semantic limits and, when necessary, he does not hesitate to coin brand new categories. Third, this vision is *nourished* by a twofold tension: towards a radical empiricism (basically a pluralism of interconnected events) and towards a complete formalism (that had various guises but the importance of extension and of the notion of mathematical function remained constant).

His formalizations remained open to the conceptual revolutions of his time: the early Whitehead is particularly sensitive to the recent foundational developments in algebra and geometry; in his middle period, he particularly tackles electromagnetism (including the nascent quantum mechanics, as in Planck, Einstein, and Bohr) and Einstein's relativities; the late Whitehead also shows the influence of major contemporary thinkers such as S. Alexander, H. Bergson, F. H. Bradley, C. D. Broad, J. Dewey, L.

J. Henderson, W. James, J. McTaggart, G. H. Mead, Conwy Lloyd Morgan, G. Santayana, J. Ward and, of course, B. Russell (the intertwining of Russell's and Whitehead's speculations being a subject by itself). In the background, the systems of Aristotle, Descartes, Galileo, Berkeley, Hume, Kant, Leibniz, Locke, Newton and Plato stand out as well as Darwin's.¹⁰ (Both lists are not exhaustive.) Besides, it should be noted that Whitehead is above all a dialogous philosopher of sorts: philosophy is less for him the patient exercise of historical scholarship than a living intercourse with his colleagues and friends. This should not be forgotten when reading the important *Dialogues of A. N. Whitehead. As Recorded by Lucien Price* (1954). In sum, we can claim with Dorothy Emmet that "[i]t is possible to see two sides throughout all Whitehead's work; an interest in formal schemes of logical relations, built on the model of mathematical postulates, and an interest in the concrete many-sidedness of experience."¹¹

The examination of the differences in emphasis requires the introduction of the discontinuous standpoint. Whitehead's philosophical development can be interpreted *qua* discontinuous mainly because of his shift (claimed by Whitehead himself) to ontology on the occasion of the introduction of the epochal theory of time in *Science and the Modern World* (being his Lowell Lectures of 1925). But there is also a smoother process that runs through his holistic understanding of the logico-mathematical field, his concept of geometry as a physical science, and his pancreativism. Although his interest in the axiomatisation of extension in order to express connection (rather than disconnection) and uniformity of mundane relatedness (hence the possibility of significance, recognition and measurement) has never failed, it gradually shifted from bare spatial extension to spatio-temporal being and eventually to ontological (or existential) extension. One could furthermore see in the mathematical function the speculative engine that lured Whitehead in the direction of process thinking.¹²

To sum up: while the notion of extension is the Ariadne's clew of his entire philosophical development, it has evolved significantly between the *Universal Algebra* of 1898 and *Process and Reality* of 1929 (the acme of his speculative attempts). More than this, the irruption of the concept of "creative advance" in the *Principles of Natural Knowledge* of 1919 signals the start of the real processual slant of his research program. Relativism and interconnectedness are now conceived dynamically, in the making: extension is not only *required* by process, it is *derivative* from process (PNK 202). But it is only in 1925, with his epochal theory of time directly inspired by the late William James' "buds" or "drops" of experience, that genuine creativity receives a proper theorization: without the so-called

“atomic” (in the etymological sense of the word) structure of experience, process is only a continuous transformation of a pre-existing “stuff.” Hence the announced double relevance of the concept of contiguism: developmental and ontological.

A Treatise on Universal Algebra (1898) constitutes his first book. It is largely founded on a thorough investigation of Grassmann's calculus of extension (*Ausdehnungslehre*, 1844 and 1862)¹³ and shows the influence of 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.” (Let us note that Russell's and Couturat's Leibnizian inquiries have yet to come.) 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. as well 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 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). Whitehead looks for nothing less than the “fundamental relations” acting between “ultimate existents.” The monograph launches the heavy criticism of Newtonian materialism that will mainly occupy his next epochs and introduces various other forthcoming features as well (e.g., the “theory of interpoints” that anticipates his “method of extensive abstraction”). The background is here constituted by James Clerk Maxwell's thought and the natural philosophy of George Gabriel Stokes, Peter Guthrie Tait and William Thomson (later known as Lord Kelvin).

Russell came up to Trinity in 1890 and followed Whitehead's lectures. In 1903, he published *The Principles of Mathematics* (finished in 1900) 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*