

Michel Weber and Will Desmond (eds.), *Handbook of Whiteheadian Process Thought*, Frankfurt / Lancaster, ontos verlag, Process Thought X1 & X2, 2008.

blurb:

Gathering 115 entries written by 101 internationally renowned experts in their fields, the *Handbook of Whiteheadian Process Thought* 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. Two kinds of entries are weaved together in order to interpret Whitehead *secundum* Whitehead and to read him from the vantage point of interdisciplinary and crossdisciplinary research. The “thematic” entries provide (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. The “biographical” entries provide (i) a brief vita of the targeted thinker; (ii) a sketch of his/her categories relevant to the Whiteheadian scholarship; (iii) a personal assessment of the actual (or possible) Whiteheadian semantic transfer to or from the thinker.



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# Abbreviations

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

# I. Introduction

Michel Weber

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.”<sup>1</sup> 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.<sup>2</sup> 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.<sup>3</sup> 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.<sup>4</sup> 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.<sup>5</sup> 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.<sup>6</sup> 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 Jamesian 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.<sup>7</sup> 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.<sup>8</sup>

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*<sup>9</sup>); (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*<sup>10</sup>) 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.<sup>11</sup> *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.<sup>12</sup>

*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.<sup>13</sup> 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.<sup>14</sup>

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.”<sup>15</sup> 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*.<sup>16</sup>



### 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.<sup>17</sup>

*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*.<sup>18</sup> 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*.<sup>19</sup> *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"<sup>20</sup> or "direct recognition,"<sup>21</sup> 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.<sup>22</sup> 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.”<sup>23</sup>

*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”<sup>24</sup>). 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)<sup>25</sup> 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.”<sup>26</sup> 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 Jamesian 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<sup>27</sup>) 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,”<sup>28</sup> the philosopher remarks that life should not be equated with survival as such: mere persistence is nothing but death.<sup>29</sup> *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 Watt’s (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<sup>30</sup> while the global imaginative standpoint needed to pilot it and the emphasis upon novelty<sup>31</sup> 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 commonsensical 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.”<sup>32</sup>

## 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 Hertz 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 Elliott 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.<sup>33</sup>

## 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.<sup>34</sup>

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](http://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](http://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](http://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](http://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](http://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.<sup>35</sup>

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)<sup>36</sup> and publishes the *Studia Whiteheadiana* (issue 1, 2003; 2, 2006; 3, 2008). The contact person is: Bogdan M. Ogrodnik (Silesian University), [bogrod@interia.pl](mailto: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 Főrizs 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](mailto: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](mailto: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](mailto: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.<sup>37</sup> Joseph Mabika Nkata,<sup>38</sup> Alphonse Ngindu Mushete<sup>39</sup> and David Ongombe Talhuata<sup>40</sup> 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 inexhaustibility: *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*<sup>41</sup> 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,<sup>42</sup> 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.<sup>43</sup> 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.<sup>44</sup>

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).<sup>45</sup>

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 Bernhard 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.<sup>46</sup>

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

- <sup>1</sup> 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).
- <sup>2</sup> Cf., e.g., *R* 38 and *PR* 73 sq.
- <sup>3</sup> 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).
- <sup>4</sup> 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.
- <sup>5</sup> 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).
- <sup>6</sup> 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 Hartz 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).
- <sup>7</sup> 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.
- <sup>8</sup> 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.
- <sup>9</sup> 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.
- <sup>10</sup> 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.
- <sup>11</sup> 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 logisch-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 Medizin 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.
- <sup>12</sup> As *PR* 328 claims: "although 'coincidence' is used as a test of congruence, it is not the meaning of congruence."

- <sup>13</sup> “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).
- <sup>14</sup> *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.”
- <sup>15</sup> “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.
- <sup>16</sup> 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).
- <sup>17</sup> 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 contiguous 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’Eprèmesnil (éditeurs), *Chromatikon. Annuaire de la philosophie en procès—Yearbook of Philosophy in Process*, Louvain-la-Neuve, Presses universitaires de Louvain, 2005, pp. 159-174.
- <sup>18</sup> 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.
- <sup>19</sup> 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).
- <sup>20</sup> See, e.g., *S* 5, 40 and *cf.* also 17, 20, 53-56 and *PR* 168.
- <sup>21</sup> *S* 7 and *passim*; *PR* 65, etc.
- <sup>22</sup> “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.
- <sup>23</sup> “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.

<sup>24</sup> Cf. *OT* 9-10 and 28 or *AE* 4 and 14.

<sup>25</sup> 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.)

<sup>26</sup> See Lowe’s *A.N. Whitehead, op. cit.*, II, p. 252.

<sup>27</sup> “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).

<sup>28</sup> “The primary function of Reason is the direction of the attack on the environment” (*FR* 8).

<sup>29</sup> “The art of persistence is to be dead” (*FR* 4).

<sup>30</sup> “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).

<sup>31</sup> “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).

<sup>32</sup> “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).

<sup>33</sup> 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](http://www.espt.de).

<sup>34</sup> 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.

<sup>35</sup> “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.

<sup>36</sup> “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.

<sup>37</sup> 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 Zaïre, 1980.



- <sup>38</sup> 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.
- <sup>39</sup> Alphonse Ngindu Mushete, *Les thèmes majeurs de la théologie africaine*, Paris, Éditions L’Harmattan, 1989.
- <sup>40</sup> B. Bourguine, D. Ongombe et M. Weber (éditeurs), *Regards croisés sur Alfred North Whitehead. Religions, sciences, politiques*, Frankfurt, Ontos Verlag, 2007.
- <sup>41</sup> 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.
- <sup>42</sup> See “extensity and intensity” (PNK 69).
- <sup>43</sup> 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.
- <sup>44</sup> 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.
- <sup>45</sup> 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.
- <sup>46</sup> 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 historic-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 Historisch-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.