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Research Article

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A.N. Whitehead and Process Thought

An Overview to Facilitate Transdisciplinary Applications within
Social and Human Sciences

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Abstract: This contribution offers a sense of the scope and transdisciplinary relevance of the philosophy of British mathematician and philosopher Alfred North Whitehead by providing an overview of the three main phases of his career. The contribution goes on to distinguish process thought from the substance thought which dominated modern philosophy, and to outline some of the ways in which Whitehead has influenced thought from across the full spectrum of academic disciplines.

Keywords: Whitehead; process thinking; transdisciplinarity

1 Introduction

Alfred North Whitehead was born in Southern England (Ramsgate, 1861), educated at the University in Cambridge, and died in Cambridge Massachusetts in 1947. Whitehead achieved international recognition for his groundbreaking work (with Russell) on mathematics and logic, and for his comprehensive articulation of a wide-ranging philosophy of organism. The keynote of this philosophy is a recognition of reality as relational process. Nature, from Whitehead's perspective, is no fixed quantity but the creative advance of an ever-incomplete process. As noted in the Editor's introduction to this Special Issue, Whitehead's mode of thought is of broad relevance to the mission of this journal to foster interdisciplinary collaborations and transdisciplinary insights. Whitehead aimed to articulate a set of concepts of sufficiently broad generality to encompass the subject matter of any and every discipline, and today there is a growing appetite for such wide-reaching thought amongst academics

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and scientists from many spheres of thought and practice. Because Whitehead's philosophy is still poorly understood, this introductory paper offers an overview informed by the device of identifying three main phases within his career.

2 Phase 1: Cambridge and Mathematics

After graduating, Whitehead stayed at Cambridge until 1910. In this first phase of his academic career he published substantial investigations into the structure of mathematical thought and the canons of logical inference from data. These include *The Treatise of Universal Algebra* (1898), *The Axioms of Projective Geometry* (1906b) and *The Axioms of Descriptive Geometry* (1907). As Wightman (2014) suggests, the culmination of this first phase was his work with Bertrand Russell which resulted in the three volumes of their *Principia Mathematica* (between 1910 and 1913) which transformed mathematics and logic. If we insist on describing this as a phase in Whitehead's process of intellectual development, this is because many misunderstandings follow if the achievements of the *Principia Mathematica* are mistaken for Whitehead's main contribution. Indeed, during the time of their collaboration, Russell and Whitehead were already on very different paths. In a manner that would become typical of so-called 'analytical philosophy', Russell inclined to use their new mathematical and logical insights to clear up confusions in the shallows of ordinary language (Wightman 2014), whilst Whitehead, as we shall see, had his eyes on the bigger fish in the shadowy depths.

3 Phase 2: London and Philosophy of Science

In 1911 Whitehead moved to the University of London, first as a lecturer at University College London, and three years later as Professor of Applied Mathematics at Imperial College. From 1915-17 he served as President of the Mathematical Association. In this second phase of his career Whitehead's strong background in mathematical logic and theoretical physics provided the basis for four significant early contributions to the philosophy of science: *The Organisation of Thought* (1917) (OT), *Enquiry into the Principles of Natural Knowledge* (1919) (PNK), *The Concept of Nature* (1920) (CN) and *The Principle of Relativity* (1922) (TPR). All four books acknowledged the pressing need for a philosophy of science that was up to speed with the latest momentous developments in physics. The fourth book of the quartet offered a systematic reinterpretation of Einstein's relativity theory consistent with the philosophy of events and objects developed in the volumes from 1919 and 1920 (Whitehead had met Einstein in 1921).

During this second phase Whitehead sought to re-organise the fundamental ideas of time, space, matter and measurement that had been rendered irrelevant by recent scientific discoveries. He was clear that this aim to ‘tamper with your basic concepts’ (1922, p. 6) demands the tools of philosophy. Those who neglect philosophy when reforming core ideas, he asserted, make the mistake of assuming the absolute correctness of the philosophy that they happen, knowingly or unknowingly, to have inherited (‘imbibed from a nurse or a schoolmaster’). Whitehead likens this naïve attitude to ‘those who thank Providence that they have been saved from the perplexities of religious enquiry by the happiness of birth into the true faith’ (1922, p. 6). But Whitehead was also clear that for him this required a limitation concerning what it means to philosophise. Notably, his philosophical approach during this phase is ‘solely engaged in determining the most general conceptions which apply to things observed by the senses’ (1922, p. 4). His philosophy will therefore have ‘nothing to do with ethics or theology or the theory of aesthetics’. This philosophy, he proposes, is not metaphysics but pan-physics. The aim of pan-physics is to formulate general principles of science ‘which are employed equally in every branch of natural science’ (1922, p. 4). This formation as pan-physics does not make of philosophy the hand-maid of science. Rather, since philosophy thus conceived is designed to sharpen the armoury of concepts whose fashioning it depends upon, pan-physics must supply science with added analytical power and hence help with the discovery, and not just the justification, of scientific truth (1922, p. 6).

3.1 An Important Transition in Whitehead’s Thought

After the quartet of contributions to philosophy of science discussed above, Whitehead went through a highly transitional three-year period in which he produced no substantial publications (see Wightman 2014). During this period three important transitions were, as it were, layered on top of each other. First there was a geographical transition as Whitehead and his family moved from the UK to the USA. Second there was a professional transition since he was invited to take up a post in philosophy at Harvard University in 1924. Before this point Whitehead was employed for the most part as an applied mathematician. Third, these physical and professional transitions were accompanied by a small but highly significant intellectual change in his philosophical outlook. We linger on this ‘intellectual somersault’ (Wightman 2014, p. 339) because insufficient attention to the implications of this ‘liminal’ phase of change (Stenner 2022) have led to recurrent misinterpretations of Whitehead’s philosophical message.

Up until at least 1922, as we have argued, Whitehead had aimed for knowledge based on philosophical thought disciplined by science. He had argued that valid

generalisations must be based purely on philosophical concepts that are firmly grounded in physical science. One aspect of this was his effort to deduce scientific concepts from the simplest elements of perceptual knowledge. The ambition was to clarify how immediate experience can provide the groundwork for all knowledge. In a sense, he aimed to purge from philosophy of science any extraneous metaphysical assumptions. In *OT* (1917) he urged that ‘the basis of science does not depend on the assumption of any of the conclusions of metaphysics’ (this chapter from *OT* is reprinted in Whitehead 1962, p. 161). For Whitehead during this second phase, science – adequately philosophised – must function as the rock on which all knowledge must stand. Philosophy fashioned as pan-physics aims for nothing less than the unification of all sciences as one science:

The philosophy of a science is the endeavour to express explicitly those unifying characteristics which pervade that complex of thoughts and make it to be a science. The philosophy of the sciences – conceived as one subject – is the endeavour to exhibit all sciences as one science, or – in case of defeat – the disproof of such a possibility. (Whitehead 1920, p. 2).

If the culmination of this phase was reached with the publication of *TPR* (1922), then we should not be surprised to learn that in that book he goes as far as to define philosophy of science (‘the endeavour to formulate the most general characters of the things observed’) as science: ‘it only differs from any of the special natural sciences by the fact that it is natural science at the stage before it is convenient to split it up into its various branches’ (p. 5). None of this is intended to deny Whitehead’s keen awareness of forms of experience, like values, that fall outside of philosophy of science. Rather, during this phase, Whitehead was at pains to emphasise that he was not attempting to engage in metaphysics. Relevant here is his distinction between ‘homogenous’ and ‘heterogeneous’ ways of thinking about nature. Whitehead insisted (during this phase) that his philosophy of science was ‘homogeneous’. What he meant by this is that when thinking about nature, he does not think about thought or sense awareness (Whitehead 1920, p. 5). Homogenous thought about nature thus deliberately excludes any reference, not just to thought and sense awareness, but also to things like moral or aesthetic or religious values. Such values may of course turn out to be the key to any ‘heterogeneous’ metaphysical synthesis of existence as such. But Whitehead insists that ‘such a synthesis is exactly what I am not attempting’ (p. 5). He is here interested only in nature as that which we observe as directly delivered by perception. Up until about 1922, in sum, Whitehead was operating on the assumption that a completed philosophy, capable of covering the whole of experience, must be based on a philosophical generalisation of science. The assumption is that what is real philosophically must be decided on the basis of what science takes to be real.

Apart from invited presentations and small pieces of work, Whitehead was virtually silent during this liminal period starting around 1922. The virtual silence is broken in 1925 with the publication of *Science and the Modern World* (SMW). The preface of this significant new book announces something new within Whitehead's oeuvre:

...the cosmology derived from science has been asserting itself at the expense of older points of view with their origins elsewhere. Men can be provincial in time as well as place. We may ask ourselves whether the scientific mentality of the modern world in the immediate past is not a successful example of such provincial limitation.

Science here is no longer supplying the basis for philosophy. Rather, philosophy is presented as playing the rôle of critic of scientific cosmology. By 1925 there is a new openness to 'divergent intuitions as to the nature of things', and science is presented as on a par with aesthetics, ethics and religion as the 'various human interests which suggest cosmologies'. Philosophy is no longer understood as a general natural science (pan-physics). Rather, at least one of the jobs of philosophy is now understood to be the task of harmonising, justifying and refashioning the divergent intuitions that feed into cosmologies. The aim is to avoid the domination of any one point of view, and hence to ensure that the overarching cosmology is not provincial and skewed towards any one partial field of human interest. During this third 'mature' phase of his career, Whitehead is indeed now broaching the heterogeneous territory of metaphysics that he had previously so carefully bracketed out of scope. The significance of this change of emphasis and attitude should not be downplayed. Elsewhere, in a recent overview of process thinking, I sum this up as follows:

Instead of building a cosmology solely on the rock of science, the ultimate ideas of science must be scrutinised, and balanced attention given to 'the whole of the evidence in shaping our cosmological scheme'. Indeed, from this point on the conception of science as the 'rock' of all knowledge is the primary case of the fallacy of misplaced concreteness. (Stenner 2022).

4 Phase 3: Harvard and Philosophy of Organism

Starting with *Science and the Modern World* in 1925, Whitehead published a series of fully-fledged philosophical books including *Religion in the Making* (Whitehead 1925) (RM), *Symbolism: Its Meaning and Effect* (1927) (SME), *Process and Reality* (1929) (PR), *Adventures of Ideas* (1933) (AI), and *Modes of Thought* (1938) (MT). Together these books can be thought of as offering Whitehead's genealogical diagnosis of a significant problem affecting the Western tradition, along with his proposed philosophical solution. During this third 'mature' phase, from 1925 until his death in 1947, scientific

knowledge remained profoundly important to Whitehead, but he was keenly aware that scientific knowledge is a high-grade abstraction and that ‘the intolerant use of abstraction is the major vice of the intellect’ (1925, p. 26–7). The entire thrust of SMW is to make explicit the socio-cultural conditions of possibility underlying the remarkable flowering of modern science in Seventeenth Century Europe, and to trace the significant effects wrought by this development of science on ‘Western culture during the last three centuries’. It is essentially a genealogical study of the emergence and consequences of the ‘mentality of an epoch’ (or at least the climate of opinion dominant amongst the educated sections of society), i.e. a study which reads history both forwards (attending to what *issues* from an established mentality) and backwards (attending to its antecedents). Essentially, Whitehead’s diagnosis is that the cosmology defining Western culture since about 1,600 presupposes a deeply problematic philosophical assumption that Whitehead names ‘scientific materialism’ (p. 22). The fixed scientific cosmology of scientific materialism:

...presupposes the ultimate fact of an irreducible brute matter, or material, spread throughout space in a flux of configurations. In itself such a material is senseless, valueless, purposeless. It just does what it does do, following a fixed routine imposed by external relations which do not spring from the nature of its being.

Whitehead is scathing about scientific materialism. It is ‘entirely unsuited to the scientific situation at which we have now arrived’ and has ‘adversely affected the various currents of European thought’. It is part of an ‘historical revolt’ that was and is thoroughly ‘anti-rationalistic’ and it has ‘been exaggerated into the exclusion of philosophy from its proper role of harmonising the various abstractions of methodological thought’. It partakes in ‘the major vice of the intellect’, which is the ‘intolerant use of abstractions’ (23). In short, the contribution of the book is no simple celebration of science as a Western achievement, but a damning of its widespread cosmological influence via scientific materialism.

It is important to recognise that Whitehead could not have gone through the liminal transition to this third phase had his previous work not provided him with exactly the clear conception of the nature of scientific knowledge that he then subjected to critique. Thanks to the rigour of his first (Cambridge, mathematical) phase he was able, during his second (London, philosophy of science) phase to become more acutely aware that three fundamental concepts were dominating scientific knowledge, and hence thought and practice. The first was the notion of the *instant of time*, the second the notion of *simple location in space*, and the third the conception of *matter as irreducible substance* (see Lestienne 2020, Chapter 4). These were the things that Western science took to be ultimate unquestionable realities. Whitehead had already articulated these insights as early as 1905 in an

early statement of metaphysics (see Whitehead 1906a). He had drawn upon Leibniz to reject the idea that a simple point in space is necessarily an ultimate geometrical reality without which space cannot be meaningfully decomposed. Classical science had assumed that if matter is the ultimate substance of the universe then without the notion of a material point one cannot precisely specify the location of a given piece or particle of matter in space. Leibniz, however, had worked out a relational concept of space for which lines of force, not points or particles, were the ultimate realities, and Whitehead favoured Leibniz's notion. But at that point he still accepted that time must be composed of instants (to describe the motion of a moving particle we must measure time). As Lestienne (2020, pp. 57–58) shows, this changes in early September 1911 when Whitehead writes a letter to Russell announcing that he had stayed up until early morning noting down the ramifications of a new idea that had 'suddenly flashed on me', namely:

...a relational theory of time, exactly on four legs with that of space. As far as I can see, it gets over all the old difficulties, and above all abolishes the instant of time. (Whitehead, cited in Lestienne 2020, p. 58).

This insight fed into and was systematically articulated during Whitehead's London phase of philosophy of science. In *PNK* he clearly expresses that 'absolute time is just as much a metaphysical monstrosity as absolute space' (p. 8), insisting that the 'ultimate fact for observational knowledge is *perception through a duration*' and not a 'durationless instant' (p. 2). This is a clear statement to the effect that the notions of instants of time and points in space have been mistaken as fundamental realities by the classical tradition, when in fact they are abstractions. They lack concrete reality and hence – unlike perception through a duration – can never serve as ultimate fact for observational knowledge, because they can never be directly experienced. Also, in Chapter 2 of *CN* (1920), Whitehead had already introduced his famous theme of the bifurcation of nature. By this phrase he meant the problematic division of nature into fact and value, or better, meaningless matter and matterless meaning. Crudely put, the bifurcation stems from the assumption of scientific materialism: if true reality is pure aimless, meaningless matter, then how is one to accommodate those many questions of value, aim and meaning that are self-evidently relevant and important within human society? During his second phase, however, these insights borne from the first phase were articulated solely in the 'homogeneous' form of a pan-physical philosophy of science. During his third (Harvard, philosophy of organism) phase, Whitehead came to adopt what he had previously called the 'heterogeneous' position of, essentially, a metaphysics or ontology inclusive of more than pan-physics.

The process just outlined above of adopting a ‘heterogenous’ philosophy did not happen all at once. The third phase began with Whitehead taking clear stock of the damaging effects that the abstraction of scientific materialism was producing within Western culture (SMW). But in SMW, Whitehead sought to expressly exclude any considerations of an epistemological nature. He excluded epistemology the better to focus on his main target of diagnosing how and why the quiet birth of modern science had re-coloured the mentality of educated Westerners as it crystallised around the fixed scientific cosmology of scientific materialism (i.e. the genealogy of a new *mentality* ‘more important even than the new science and the new technology’, p. 3).

A second crucial and expressly epistemological step came with Whitehead’s rethinking of the concept of experience in SME. He came to a clear appreciation of the sterility of the empiricist account of experience stemming from Locke and Hume (and embalmed in the work of Kant) which stems, precisely, from its neglect of *durational* reality of perception and of experience more generally. Experience, Whitehead had clearly understood, is a *going through*: a process. The high-level sense perception that Locke and Hume had mistaken for the basic epistemological building blocks of all knowledge, Whitehead understood to be a complex synthesis involving causal efficacy, presentational immediacy and symbolic reference generated by their contrast (see Posch, *this issue*, and Stenner 2017).

A third step was Whitehead’s renewed investigation and evaluation of other fields of human interest that are relevant to cosmology beyond science (RM dealt with religion, AI dealt with ethical principles). Each of these steps within the third phase created the conditions for Whitehead to articulate a comprehensive philosophy of process. This was a fully-fledged ‘heterogeneous’ philosophical system capable of providing rigorous alternative conceptions of the nature of existence and ultimate reality, i.e. alternative ‘utmost abstractions’ to replace the no longer tenable notions of the instant of time, simple location in space, and matter as substance. This process philosophy of organism is first presented at length in PR and given a further (but still provisional) statement in MT. The theme of nature as process (not a fixed quantity but the creative advance of an incompleteness in process) was not itself new and had long been part of his vision of a transformed philosophy of science. What *was* new was Whitehead’s ability to locate that philosophy itself within a processual account of nature and society, including the becoming of science and its role in fashioning modern society. As already stated, what made this mature philosophy possible was the articulation of new fundamental concepts. As Stenner (2022) makes clear, in the quartet of philosophy of science books discussed earlier, Whitehead treated ‘events’ and ‘objects’ as fundamental categories and used that distinction in a highly creative and rigorous way to rethink concepts of time, space and materiality. But in the mature phase neither ‘events’ nor ‘objects’ feature

amongst the 8 categories of existence introduced in PR. We do not have space here to explain all 8 categories that, for Whitehead, fundamentally exist in the universe, but we provide an overview in Figure 1 below.

Whitehead’s final atomic realities are not the bits of matter typical of substance thought but what he calls *actual entities* or *actual occasions*. Events still feature, but secondarily: ‘an actual occasion is the limiting type of an event with only one member’ (1929, p. 73). The familiar objects we encounter in our activities (like stones) must be reconceived, not as elemental substances, but as complex gatherings of actual entities (nexūs or loose assemblages of actual occasions which can also be ordered into societies) that in their togetherness gain spatial and temporal extension and hence endure through time (and form places). A carbon molecule, being comprised of a number of actual occasions, is an event, but not an actual occasion. The observations we ourselves make as observers must also be reconceived on the same terms, as actual occasions of experience. Likewise ‘objects’, defined in CN as ‘elements in nature which [unlike events] do not pass’ (and hence are subject to ‘recognition’ defined as awareness of sameness), are not included amongst the categories of existence laid out in PR. Objects (as recognised in the earlier London phase)

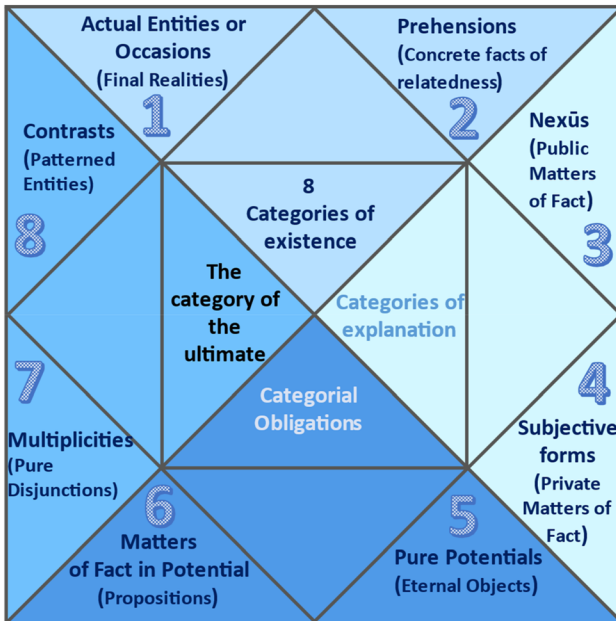


Figure 1: What exists in the universe? Whitehead’s 8 categories of existence as presented in chapter 2 of *Process and Reality* (1929/1985).

fragment, as it were, into a plethora of new concepts characterising the mature phase, like Pure Potentials or Forms of Definiteness, and Nexūs or Public Matters of Fact. Finally, in this new conceptual context, Creativity takes centre stage as the Category of the Ultimate (see Figure 1). The passage of nature is grasped as a *creative advance* composed of the becoming and perishing of actual occasion after actual occasion.

Whitehead's philosophy is thoroughly *relational* in that no actual occasion can exist in isolation from others. Each actual occasion exists in a relation of togetherness with others. This represents a thorough re-working of the subject/object distinction. Descartes had cleaved subject apart from object, treating both as self-contained substances. For Whitehead, there can be no subject without a relation to objects and there can be no object without subjects. Crudely, Whitehead encourages his reader to envisage each actual occasion on the analogy of an *experience* through which the potential at play in a multiplicity of data is selectively actualised to yield a concrete fact. Whitehead calls this selective actualization of the potentials at play during a given event the *concrecence*: the becoming concrete of an actuality. Concrecence is the growth from the merely real to the actual. That growth is achieved by means of what Whitehead calls *prehensions*. The data of the universe available to a given actual occasion are either negatively prehended such that they do not feature in the internal constitution of the occasion, or positively prehended (*felt*) such they do feature. The realities of the world are thus observable as products of relational processes, never static but ever 'there' for 'feeling' (or 'positive prehension'), where 'feeling' is no uniquely human preserve, but the fundamental operation (prehension) through which facts arise and from which they depart. Hence, once an actual entity has become concrete it takes its place as one more fact in the real world to serve as potential for another actual occasion of experience to 'prehend' (and hence 'feel' or not). Any concrete actuality, in other words, is merely a potential for the next concrecence. This means that another type of passage (in addition to concrecence) must be discriminated. Namely, the passage from the actual to the merely real. Whitehead calls this second type of fluency, which is the passage from attained actuality to actuality in attainment, the *transition*.

Together the *concrecence* and the *transition* make up what Whitehead means by the word process, the first applying to the microscopic domain and the second to the macroscopic. The principle of process thus gives the concept of *becoming* priority over *being* because the *being* of an entity is *constituted* by its *becoming*: 'how an entity becomes constitutes *what* that actual entity *is*' (PR, p. 23). The principle of process is not a trivial matter of 'preferring' passage over endurance. The implication is that we cannot discard the importance of passage (as routinely occurred during the history of

philosophy) and must *explain* endurance, since enduring things arise from and return to passing processes.

Since actual occasions (and not irreducible substances) are, for Whitehead, the ultimate entities out of which the universe is composed, process philosophy has the advantage of providing a unitary cosmology and of avoiding the ‘bifurcation of nature’ noted above. In principle, the concept of actual occasion should be equally applicable, though with sharply graded relevance, to the atomic events dealt with by physicists (e.g. atoms and sub-atomic particles as modifications of the form of energy) and the communicative events dealt with by sociologists. And since each actual occasion takes the form of an experience, it is not necessary to be embarrassed about taking experience seriously as a social scientist or psychologist. Indeed, the concept of experience is rescued from the old empiricism of sense-data that was preserved in modified form by Kant (see Szakolczai 2004). Finally, where modern disciplinary thought emphasises familiar dualisms (like subject and object, agency and structure, free-will and determinism, teleology and efficient causality, individual and society, mind and matter, etc.) Whitehead encourages a ‘both/and’ vocabulary of productive contrasts like the becoming of unity through multiplicity and the emergence of possibilities from actualities. This in turn facilitates movement between and beyond existing disciplinary formations.

5 Discussion and Concluding Remarks

Whitehead’s philosophy can be thought of as a thorough critique and re-working of the modern philosophical settlement that had been achieved by Emanuel Kant through a synthesis of Cartesian rationalism with Locke and Hume’s empiricism (see Stenner and Nichterlein 2025). Whitehead, especially thanks to his training in theoretical physics and familiarity with Maxwell’s formulae for unifying the phenomena of electricity and magnetism, was keenly aware of the extent to which these modern forms of empiricism and rationalism depended upon the weaker aspects of Newton’s cosmology. To achieve his re-working, Whitehead built upon and systematised the new forms of process thinking that were arising in the wake of Darwin’s evolutionary biology, especially the work of Henri Bergson in France, and the North American ‘pragmatists’ (especially William James and John Dewey). To simplify somewhat, one might say that Whitehead systematised the radical empiricism of William James with the intuitive rationalism of Henri Bergson. On the one hand, James’ grasp of the nature of the experiencing subject as the ongoing product of a flowing stream of experience allowed Whitehead to profoundly challenge the old and dogmatic empiricism of Locke and Hume (see Stenner 2011b). On the other hand, Bergson’s concepts of *durée* and of ‘spatialised’ time showed him the error of

Descartes' modern type of rationalism, which equally neglected the problem of becoming through its assumption that thought and extension must be conceived as distinct substances. Kant, despite his brilliance, had swallowed whole these taken for granted assumptions that ultimate reality is to be conceived as some sort of substance.

In this sense, Whitehead's philosophy of process can be contrasted with the modern philosophy of substance. For substance philosophers the ultimate reality is substance. 'Substance' is some ultimate 'stuff' supposed to exist independently in-and-of-itself in splendid autonomy, here, now and always. For Whitehead, by contrast, the realities of the world are products of relational processes, never static but ever there for the next phase of production. This is less a matter of 'siding' with passage over endurance than of granting the status of fundamental reality to process, whilst reframing forms of endurance as phenomena that cannot be taken for granted because they stand in need of explanation. 'Substance thought', by contrast, is a name that can be given to the mode of thought that has dominated western philosophy and science. It mistakes 'substance' for ultimate reality. If we ignore the long geological processes at play in its emergence, and the raging torrent of constant microscopic activity composing it at a quantum level, a stone, for example might serve to exemplify ultimate reality because it appears to exist in space and to endure in time independently of anything else. Some of its qualities (its colour, its temperature) might shift and change with time, but the basic stony substance seems to remain unchanging. This alluring idea of ultimate reality as something which endures 'now / here' in a permanent and self-contained manner has mesmerised thinkers for obvious reasons. But it is misleading because actually it ignores both the geology of its slow becoming and the quantum physics of its continuing being. Whitehead's philosophy, informed by the transformative developments in physics, sweeps these philosophical assumptions aside and offers new modes of thought consistent more consistent with recent developments in science and humanities alike.

In sum, for process philosophy the universe is no longer conceived as an inert machine but as a passage of nature composed of the becoming and perishing of actual occasion after actual occasion, each a relational confluence. Pitched at this maximally general level of expression it should be clear that this change in philosophy will have (and has had) revolutionary implications for each and every knowledge discipline as well as for our basic self-understanding both as individuals and as a species living amongst others in an ever-changing environment. If the familiar objects and structures we encounter in our activities must be reconceived as complex gatherings and assemblages of events, then we must learn afresh how to think relationally and in terms of durations, occasions, operations, timings, rhythms, projections and retractions and the 'togetherness' of processes.

To end I will make some observations about the influence of process thought on a range of disciplines. These observations are indicative and far from exhaustive. First, Whitehead's thought has already been influential within the growing discourse and practice of transdisciplinarity (see Stenner 2014, 2024). In addition, Whitehead has been influential across many individual disciplines (see especially Weber and Desmond 2008 which contains 115 entries written by 101 international experts from different fields). This impact includes notable influence on major figures from a range of fields. For example, he was a considerable influence on Bohm's (1995) physics of the implicate order; Waddington's (1956) epigenetic biology; Bertalanffy's (1973) development of systems theory; the philosophy of Langer (1953) and Deleuze (1993, 2007); Bateson's (1972) ecology of mind; the sociology of Luhmann (1996) and Latour (2007); Haraway's (1988) cyborg-feminism of situated knowledge; the complexity science of Prigogine and Stengers (2018), and many other notable thought-leaders in specialisms from physics to theology and literature. In my own work I have found Whitehead's philosophy very useful for reformulating the pre-suppositions of social psychology (Stenner 2008, 2011a,b, 2016, 2021), and psychosocial studies more generally (Stenner 2007, 2022), including methodology (Stenner 2009, 2012, 2023). The history of individuality Whitehead provides in AOI has been particularly helpful in understanding the genealogy of human rights discourse in its relevance to contemporary subjectivity (Stenner 2013). It can be anticipated that the broad influence of Whitehead across disciplines will increase as awareness of process thinking continues to grow.

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