

Locating Atomicity

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Extensive continuity is a basic and pervasive feature of our world. It is presupposed by scientific measurement and theory. Few philosophers have appreciated its significance more than the inventor of the method of extensive abstraction. Its way of defining a point in terms of ever decreasing volumes presupposes infinite divisibility. Applied to spacetime, this means that every event is encompassed by larger events and encompasses smaller events, without end. The world of events (for the philosophy of nature) is thoroughly continuous. Nevertheless, "the ultimate metaphysical truth is atomism" (PR 35).¹

Without some discontinuity, there would be no room for concrescence, no room for becoming. There would be no way of distinguishing between the coming into being of an event and that event itself. Continuous creation supposes there can be creation at each instant only because the creator is outside time, but this cannot apply to any self-creating squeezed into a second. In order to overcome the pervasive continuity of time, some temporal atomicity is required to situate concrescent becoming.²

1 This statement, to be sure, is elliptical, for Whitehead means that only actuality is atomic, while potentiality is continuous. More precisely, as we shall see, it is becoming which is atomic, in contrast to being which is continuous.

2 While temporal atomicity is integral to his philosophical endeavour, this does not directly entail that his occasions should be so small. Some occasions must be small, for otherwise we cannot explain change and motion in terms of the difference between successive occasions. Were there an adequate theory whereby larger occasions might include smaller ones, then there could be occasions of any size. Whitehead excluded that alternative because he took it to mean that contemporary concrescing occasions would have toprehend each other, which would be impossible. I think, however, his philosophy can be modified on this point to permit satisfactory relations between such occasions. See "Inclusive Occasions," pp. 107-136 in *Process in Context: Essays in Post-Whiteheadian Perspectives*, edited by Ernest Wolf-Gazo (Bern/Frankfurt: Peter Lang Verlag, 1988).

Temporal atomism, however, cannot be adequately comprehended on analogy with the more familiar material atomism. Whitehead found it particularly difficult to determine precisely what was atomic, and how this fits with extensive continuity. Is the occasion as a whole or in some undifferentiated sense actually indivisible, or does it lie in the event brought into being, or in its act of (self-)creation? All of these are options Whitehead investigates, and all but the last prove ultimately to be unsatisfactory. Eventually, but only after about two and a half-years, he will hit upon the approach that will guide his systematic elaboration of the theory of concrescence (PR, part III).³ This is found in the conclusion to his Zeno-like argument (inserted in part II) that "in every act of becoming there is the becoming of something which temporal extension; but that the act itself is not extensive, in the sense that it is divisible into earlier and later acts of being" (PR 69). The satisfaction is (coordinately) divisible, but not the concrescence.⁴

Among the many shifts in Whitehead's philosophical thinking that can be chartered,⁵ the two which are particularly basic both turn on the issue of the exact nature of temporal atomism. The first has been frequently emphasized, the second scarcely noticed. The first marks the difference between the earlier philosophy of nature and the later metaphysical works. It is usually assumed that *Science and the Modern World* as a whole introduces the shift, but it really takes place within that work. The original Lowell Lectures of 1925 on which that book is based are much more continuous with the philosophy of nature. Only later additions introduce the epochal theory of time which is the basis for Whitehead's characteristic metaphysics.⁶

3 I reckon this from April 1925, when he seems to have discovered the epochal theory of time (EWM 1-21, 51-65), to the fall of 1927, which includes the first version of PR, part II.

4 It was only later that Whitehead thought in terms of genetic division instead of genetic analysis. In any case, a genetic phase is not a smaller act of becoming, but only one aspect of such an act.

5 See EWM, particularly as summarized in chapter 10.

6 EWM, chap. 1 and "Whitehead's First Metaphysical Synthesis," *International Philosophical Quarterly* 17/3 (September, 1977), 251-64. For a critique of my position, see Victor Lowe, "Ford's Discovery About Whitehead," *International Philosophical Quarterly* 18/2 (June, 1978), 223-26.

The second shift, far less obvious but no less basic, here concerning the theory of concrescence, takes place *within Process and Reality* itself. The earlier theory conceives concrescence as initiating from a single atomic datum (so the original text of part II), the later with a multiplicity of past occasions physically prehended (part III). Since the later theory is Whitehead's mature, final position, we are apt to read past the clues for the earlier theory, supposing it to be only a vaguer version of the official doctrine. Then the shift (and its wide-ranging significance) is likely not to be noticed. This essay highlights this second shift by working out the earlier attempts of Whitehead to understand concrescence, and the way in which they depend upon different articulations of temporal atomism.

There are differences in the way Whitehead argues for the epochal theory. The first argument (SMW 122-27) is obscure, convoluted, and not totally convincing.⁷ Subsequently he devised a more succinct and effective Zeno-like argument to establish "time as epochal" for his presentation on "Time" for the Sixth International Congress of Philosophy, September 1926 (IS 246 = EWM 307f). This Zeno-like argument is repeated in the chapter on "The Extensive Continuum" (PR 68f).

Gottfried Heinemann has subjected the argument to searching criticism in "Zeno's Arrow and the Establishment of the Epochal Theory of Time".⁸ Heinemann argues that Whitehead's argument depends crucially upon the implicit assumption that every event has an immediate successor. With it, the argument based on the dichotomy works, but need we make this assumption?

7 I have analyzed it in EWM, chapter 3. The importance of the argument does not depend on its effectiveness, but on the fact that it may well have been how Whitehead came to espouse atomicity.

8 The essay in German appeared in *Natur, Subjektivitaet, Gott: zur Prozessphilosophie Alfred N. Whiteheads*, ed. Helmut Holzhey, Alois Rust and Reiner Wiehl. Frankfurt am Main: Suhrkamp Verlag, 1990. My review appeared in the *Review of Metaphysics* 45/4 (June 1992), 86f.

Whitehead could respond that he is making an indirect argument. In order to establish temporal discontinuity he first assumes temporal continuity. If time were truly continuous, every event would have an immediate successor. If we reject this assumption, aren't we implicitly affirming discontinuity?

In any case, I doubt whether Whitehead was primarily concerned with the problematic Zeno proposes, or with the accuracy of his exegesis of the master. He adapted some features of Zeno's arguments in order to present a succinct argument for temporal atomicity. If that argument didn't work he would have chosen another. Temporal atomicity, however, is central to his endeavor. It enabled him to resolve basic problems in his previous philosophy. At the same time it generated other problems to overcome, which could be achieved only by specifying more precisely what it was that was atomic. Both "Time" and *Process and Reality* offer practically the same argument, but they differ crucially as to what this argument establishes, whether it is the "actual occasion" or simply one aspect of it (its act of becoming).

It was no easy task to determine what is spatiotemporally atomic. Analogies with material atoms are only partially helpful. They are physically indivisible, yet because extended they are "mathematically" (i.e. spatially) divisible. That suggests that objectified occasions could be partially prehended by elimination, but we will see that Whitehead had difficulties with that as long as the occasion itself was taken to be atomic.

Occasions and material atoms differ most basically with respect to relations. Atoms are simply located, having only external relations with other atoms. Events are internally related to all other events. As the notion of process deepens, each occasion is a concrescence or growing together of its internal relations.⁹

The remainder of this essay will be devoted to a tentative reconstruction of Whitehead's development with respect to temporal atomism. It highlights passages which

9 This growth of internal relations constitutes the most general meaning of subjectivity. Something is objective when all subsequent relations to it can only be external. This meaning of subjectivity is more general than mentality, which I take to be the capacity to be influenced by possibility. Subjective aim then depends on mentality, not just subjectivity. We need to explore the possibility that there may be inorganic occasions having subjectivity but no effective subjective aim.

may serve as clues for reconstructing particular stages in the unfolding of his theory, and seeks to give reasons for each stage. The contrasts between stages may be overdrawn in the effort to show that there was in fact a revision, often one which was not anticipated beforehand. Some of the explanations may seem more plausible than others. But all these contrasts and explanations are guided by a confidence that Whitehead had good reasons for making whatever modifications he in fact made. His genius, I am persuaded, lay in his willingness to reconceptualize his philosophy over and over. This is decidedly not the same as a willingness to revise his manuscript to eliminate earlier positions. On the contrary, he seems resolved to include all of his formulations in the final publication of *Process and Reality*.

1. The Metaphysics of Nature

In the early 1920's Whitehead worked out a theory of events in such books as *The Concept of Nature* and *Principles of Natural Knowledge*. He replaced the standard notions of space, time, and matter by two notions, events and their characteristics, which were termed 'objects'. An event is conceived as any spatiotemporal volume whatsoever. This entails that any event is divisible into smaller events and is included within larger events without limit. This theory was appropriate to an account of that which we objectively perceive, but it encountered difficulties when it was extended to metaphysics in the lectures on which *Science and the Modern World* was based.

One such difficulty concerned the determination of the unit of actuality. An event can be any size whatsoever, such as an event designating everything that happened in Ireland for the past year. It is too broad to specify what we regard as actual. Some events, such as the present week, insofar as it includes both past and future elements, cannot be fully actual. At best it can only be partially actual. Other events can only be possible. Because of these difficulties Whitehead conceives of events as various aspects or modes of one underlying substantial activity. It alone is properly actual. Later, because temporal atomism gives him a way of specifying actuality more particularly, this is inverted: the

actual occasions are the units of actuality, and the creative activity, now called creativity, is actual only in terms of its instantiations (PR 7).¹⁰

Another difficulty was introduced by his novel theory of prehension. The earlier theory of prehension (in SMW) differs markedly from the later. According to the later theory (in PR), a simple prehension is either physical or conceptual, according to the nature of its datum, which is either an actual occasion or an eternal object. In the earlier theory, one event prehends another *by means of* an eternal object.¹¹ This is neither a simple physical nor conceptual prehension.¹²

Because no medium of transmission is required other than an atemporal object abstracting from all spatiotemporal considerations, any event can "prehend" (be related to) any other. Since Whitehead was protesting against the simple locatedness (external relatedness) of scientific materialism, he could now formulate the opposite extreme for his events: an event could be construed as constituted out of its prehensions of all other events. In other words, an event is affected by, or is internally related to all other events.

Thus "every volume mirrors in itself every other volume in space... each part is something from the standpoint of every other part, and also from the same standpoint every other part is something in relation to it" (SMW 65; cf. 72f). "The aspects [prehended] are aspects of other events as mutually modifying, each the others. In the pattern of aspects they stand in their pattern of mutual relatedness" (SMW 151). Theories of internal relations often find it necessary to sacrifice time, but Whitehead is committed to taking time seriously. This commitment led him to introduce the 'creative advance', even though the role of the creative advance is not adequately integrated with the rest of his theory. If it were, there would be an ontological differentiation between

10 Whitehead may have coined the term 'creativity' from 'creative activity.' While common now, 'creativity' is only attested twice in the 1920s according to the Oxford English Dictionary, Supplemental volume. One of those attestations is to Religion in the Making.

11 See my "Panpsychism and the Early History of Prehension," *Process Studies* 24 (1995), 15-33.

12 In many ways it is closest to the very sophisticated hybrid physical prehensions. Both kindsprehend actual occasions by means of eternal objects. In SMW, Whitehead had *sensa* primarily in mind. They were his initial set of eternal objects.

future, present, and past events. Because his early theory of events abstracts from actuality, it also abstracts from the creative advance, and the way events are temporally related to that advance.

Thus there is no way of distinguishing temporally which events are already constituted by all other events (ignoring temporal considerations) or which are still being constituted by features of these events as they come into being. Events *qua* events are assigned the properties of determination and determinateness.

Suppose that events were conceived solely in terms of determination. This makes good sense of present events within the creative advance. It is also possible that future events, while still highly indeterminate, could become more determinate as they are related to the present. This would account for real possibility, which depends upon the conditions laid down by the present.

The real difficulty comes with past events. If they are constituted by other events, then as present events become more determinate, their own nature should be modified. If so, past events would not be already determinate, but would be constantly becoming more determinate. Such past events would be ontologically no different from present events.

Conversely, construing all events as already determinate would account for past events but not for present or future ones.

Determinateness and external relatedness are correlated. Insofar as an occasion is indeterminate, it is receptive to the influx and growth of internal relations. But if it achieves determinate satisfaction, then it is closed to any further internal relatedness. As determinate it is externally related to whatever comes after it.

The shift to temporal atomism, however, brought about an ontological differentiation of the temporal modes. The present atomic event prehensively unifies its past, but because its atomicity precludes anything further from being added to it, it achieves complete determinateness. Hence it enjoys asymmetrical relatedness: its predecessors are all internally related to it, but it can only be externally related to its successors. Past occasions are also atomic, and fully determinate. There are no future occasions, as the process of atomization only occurs within the creative advance of the present.

Temporal atomicity also facilitated another concern of his: the investigation of the nature of 'prehensive unification'. According to the earlier theory, each event was a prehensive *unity* formed out of its relations to all other events. On the other hand, Whitehead was also deeply committed to process, even calling for the evolution of matter (SMW 93, 100f). This meant that there should be a more dynamic prehensive *unification* as well. If events consist of many prehensions in unity, there should be an account as to how these unities come into being.

Yet before the advent of temporal atomicity, there seems to be no means for differentiating between prehensive unity and unification. The terms seem to be used interchangeably. Yet the theory of internal relations he adopts requires one or the other, but not both. But if either term were applied consistently to all events, there would be inadequacies. For if all events were prehensive unities, there would be no room for the temporality of unification. On the other hand, if events were prehensive unifications, even past events would be prehensive unifications. There could be no final prehensive unities.

As we have seen, some sort of temporal atomism is essential to Whitehead's mature theory. On the other hand, many find the extreme smallness of these occasions troubling, although this does not seem to be a problem with respect to the analogous particles of subatomic physics. It should be recognized, however, that Whitehead's atomicity is independent of size. It is its application to the explanation of change that some occasions must be very small. Change is defined as the difference between successive occasions (PR 73, 80). That, coupled with the fact that he found no way in which a larger occasion could include a smaller occasion within itself, has kept the occasions small.¹³

These issues may be resolved without, however, calling the basic atomism into question.¹⁴

13 Such occasions, he argued, would be contemporaries of one another, and contemporaries cannot causally interact.

14 See my essay on "Inclusive Occasions" in *Process in Context*, edited by Ernest Wolf-Gazo.

2. Initial Implications

By arguing for the epochal theory of time in the final inserted paragraphs in the chapter on "Relativity" (SMW 122-27), Whitehead was able to resolve various difficulties entailed by the metaphysics sketched in the 1925 lectures. In place of unwieldy events of any size and divisibility, actuality could be assigned to specific occasions out of which everything could be constituted. These are spatiotemporal events, except that they cannot be divided. These occasions, moreover, terminate in determinateness, distinguishing the present processes of determination from the past as determinate and the future as indeterminate. Prehensive unification characterizes present occasions, terminating in prehensive unities, marking those same occasions as past.

There was no going back. This became a permanent feature of Whitehead's theory. All subsequent philosophizing affirms the indivisibility of occasions in some sense. Since prehensive unification was now clearly distinguished from prehensive unity, it became possible to pursue the project of clarifying concrescence, the way the many internal relations to other occasions are to be integrated into a final unity. He investigates several theories of concrescence, but all presuppose temporal atomicity of some sort. Their differences largely depend by what is designated as actually indivisible. Is it the occasion itself, the final unity achieved, the datum from which concrescence begins, or the act of concrescence itself apart from its outcome? Which it is was still to be determined.

Besides differentiating between prehensive unification and unity, Whitehead sought (in SMW) a place for mind in nature. Many have interpreted the earlier Whitehead in the light of the final theory (of PR) that all occasions enjoy subjectivity. Then every event (in SMW) would have some degree of mentality, however minimal. But only some events were then conceived to have mentality, those characterized by the so-called 'ego-objects'.

Likewise, after the introduction of temporal atomicity, he distinguishes between the ordinary, purely physical occasion and the "complete actual occasion [which] includes that which in cognitive experience takes the form of memory, anticipation, imagination,

and thought" (SMW 170).¹⁵ It was not yet determined, however, just how memory, anticipation, and thought could be integrated within prehensive unification, which had only so far been exclusively conceived in terms of the physical synthesis of prehensions. Prehensions between occasions was not yet extended to include feelings within them.

In assigning mentality to the occasion Whitehead may not have reckoned sufficiently with the implications of temporal atomicity. At this point this atomicity should be conceived as absolute, unqualified in any sense, simply because he had not yet discerned any way in which the indivisibility of occasions could be qualified. In particular there seems to be as yet no basis for genetic or coordinate divisibility. Such an occasion prehending its world and synthesizing these prehensions into an absolutely indivisible unity would have no room for mentality. To suppose that mentality could characterize some but not all occasions means that mentality is sometimes superadded to the occasion. This mentality would have to be superadded to its prehensive unity. Then there would be a change from the prehensive unity to that unity plus mentality, which is impossible. An atomic occasion cannot change.

On the other hand, perhaps mentality could be construed as a second occasion succeeding the prehensive unity. This is the theory of his next book, *Religion in the Making*.

3. Physical and Mental Occasions

Physical occasions are basic, mental occasions derivative (RM "There are two routes of creative passage from a physical occasion. One is towards another physical occasion, and the other is towards the derivative reflective occasion" (RM 101). While there may be routes of purely mental occasions, there is no suggestion that physical occasions could be derived from mental occasions. This indicates a certain asymmetry. Only physical occasions need be absolutely atomic.

15 Here see my essay on "Panpsychism and the Early History of Prehension," *Process Studies* 24 (1995), 15-33.

A good description of physical and mental occasions would be found in the following passage if it were not formulated in terms of ground and consequent:

The synthesis is the union of what is actual with what is, for that occasion, new for realisation. I have called it the union of the actual ground with the novel consequent. The ground is formed by all the facts of the world, already actual and graded in their proportion of relevance. The consequent is constituted by all the ideal forms of possibility, graded in their proportion. The grading of the actual ground arises from the creativity of some actual fact passing over into a new form by reason of the fact itself. (RM 151)

Why does Whitehead adopt these terms, ground and consequent, when he already has another set of terms that appear to have the same function? I submit that he has not yet determined whether every physical occasion must have a mental occasion as its complement. But if there are independent physical occasions, there must be some way in which they could actualize something new. Otherwise the evolution of matter, which clearly consists of independent physical occasions, could not be explained (SMW 93). Thus physical occasions, even those without accompanying mental occasions, would have, at least potentially, mental consequents.

Whitehead recognizes that the physical occasion functions as ground, and the mental occasion as consequent, where these two are conjoined (RM 116f). The distinction between ground and consequent functions separately from the types of occasions, however, as in the above quotation, in order to apply to the physical occasion by itself.

The physical occasion, as the prehensive unity of all other actual occasions, is a synthesis. The mental occasion "has the character of being an analysis of physical experience ..." (RM 118). The mental occasion is closed to the world, and derives all of its content from the physical occasion.

Whether there are or are not independent physical occasions seems to be left deliberately undetermined. Whitehead uses the same strategy as earlier: "The most complete concrete fact is dipolar, physical and mental" (RM 118). Previously "a complete actual occasion" included both the "natural event" and "cognitive experience" (SMW

170). By inference physical occasions are 'incomplete,' but does this mean they cannot exist independently?

If physical occasions could exist independently, then there would be matter devoid of mind. The emergence of mind would then be a contingent affair. Once Whitehead realized that the mental occasion was essential for any evolutionary advance, and could not itself be the product of evolution, then every physical occasion must have its own mental occasion. That step was taken in his next publication.

4. Supersession

The Sixth International Congress of Philosophy was held in Boston, September 1926, to which Whitehead presented a paper on "Time."¹⁶ It introduces the important concept of 'supersession,' although Whitehead does not continue its use beyond this essay. As long as he continued his analysis simply in terms of occasions, these were understood as occupying particular regions of the spatiotemporal continuum. Since occasions were really atomic, the continuum could only be apparently continuous, only apparently infinitely divisible. The "continuum" could only be a "cinematographic illusion," even though it is presupposed by e.g. the method of extensive abstraction.

'Supersession' enabled Whitehead to distinguish between the occasion, and the process by which the occasion makes its appearance. Eventually he can make explicit that the extensive continuum which the occasions comprise is really continuous because it is not the occasion but the process which is indivisible. That point, however, is not made here. Supersession is the replacement of one occasion by another. It draws upon our direct experience of the present, whereby a new moment replaces the one which just was, only to be replaced by a newer one. The all-at-onceness of each moment of supersession is its indivisibility.

This direct experience is reinforced by the Zeno-like argument applied to 'supersession':

16 This essay is published in *The Interpretation of Science*, ed., A. H. Johnson (Indianapolis: Bobbs-Merrill, 1961), pp. 240-247, and reprinted in EWM 303-308.

If we try to combine the notions of supersession and continuity we are at once entangled in a vicious infinite regress. For if B supersedes A, then the continuity of B requires that some earlier portion of B has superseded A antecedently to the later portion of B. This argument can be repeated on that earlier portion of B, however you choose that portion. EWM 307f

Supersession thus proceeds in a discontinuous fashion. It is to be distinguished from the occasion conceived as a quantum of spacetime, which supersedes and is superseded. Throughout the essay Whitehead uses the notion of 'concretion,' which means the concreteness achieved, rather than the process whereby the concretion arises. This process is called here for the first time 'conrescence'. Only one sentence uses this neologism:

The occasion B which acquires concretion so as to supersede A embodies a definite quantum of time which I call the 'epochal character' of the conrescence. EWM 308f

Although supersession and the concrete determinateness of the occasion are clearly distinguished, and the Zeno-like argument is applied to supersession, it is still the concretion which embodies the "definite quantum of time". Presumably this is regarded as atomic, although this is not explicitly stated. This continues earlier views, but the problem is the extensiveness of the process. The epochal theory requires that the indivisible temporal quantum be extensive to some degree. The process of supersession, replacing one moment by another, provides no conceptual means for articulating this. Initially, at least, Whitehead vests this aspect of the epochal theory in the quanta being superseded rather in the supersession itself.

This means that if the process is to be analyzed at all, it must be in terms of the occasion thus achieved. In itself it seems impossible to analyze the all-at-onceness of supersession. Nevertheless Whitehead believes he can further such analysis while making use of the theory of physical and mental occasions which he had already developed. He proposes to extend the theory of supersession operative between occasions to apply to the way physical and mental occasions are related.

Even apart from this the theory had already been modified. The conceptuality of ground and novel consequent has been folded into the conceptuality of physical and

mental occasions by the device of explicitly assigned mental occasions to every physical occasion. This simplification overcomes a complication seen to be unnecessary in his earlier theory. I don't think it should signify any greater appreciation of the mentality of purely physical occasions, however. In most cases the additional mental occasions are probably thought to be quite negligible. Their importance concerns any possible novelty which might be actualized. Physical occasions without any mental occasions, which are also devoid of novel consequents, have no way to be anything other than what they have always been. In that case no evolutionary emergence would be possible. No evolution of matter, and none of life.

The relation between the physical and the mental is understood in terms of supersession:

Each occasion supersedes other occasions, it is superseded by other occasions, and it is internally a process of supersession ... the mental occasion supersedes the physical occasion. EWM 303f.

If this internal supersession were temporal, then the earlier portion of the mental occasion would supersede the later portion, ad infinitum. Besides the occasion as a whole was the indivisible quantum of supersession. Whitehead resolved the difficulty by treating the way the mental occasion supersedes the physical occasion as "extratemporal" (EWM 304). It was not atemporal as eternal objects are, but actually partook more of process than time itself, if that were conceivable.

While internal supersession is undoubtedly a convenient way of incorporating his former analysis, and extratemporality may be a way of avoiding its most obvious difficulties, it is inherently a problematic notion. This may have led Whitehead to have abandoned the notion of supersession altogether later on, although it helped him to distinguish between the event resulting from the process of supersession and the supersession itself.

It may be wondered whether supersession could be other than temporal. If one moment is superseded another, it would seem that there must be a temporal difference between the first and the second. In internal supersession it is not clear how a mental quantum which is somehow outside time could supersede a physical quantum of time. For only a temporal quantum could supersede another temporal quantum. The mental

occasion is more an abstractive analysis of its physical occasion. Rather than replacing it, it depends upon it for the abstraction it makes, an abstraction that abstracts from time, instead of transcending it.

Also, it seems that the quantum which the occasion as a whole enjoys and the quantum of the physical occasion are one and the same in extent. There is no room for the mental occasion, which is all right if it is extratemporal. But since the mental occasion abstracts from the physical, it can also be conceived as somehow within, or as a part of the physical occasion.

There is also confusion as to whether the supersession can be analyzed in terms of what is superseded, i.e. the mental occasion. Ultimately concrescence is genetically analyzed, and this is the successor to supersession. At this stage, however, supersession seems to be a notion which on its own terms cannot be analyzed further. All that can be analyzed is the mental occasion, which is still conceived in terms of what is produced (i.e. what is superseded, not the process itself).

5. Prehending Causal Efficacy?

Prehension in the mode of presentational immediacy had already made its appearance in the essay on Time (EWM 307), which also contains some preliminary reflections on causation as physical memory (EWM 306). But can there be any prehension of causal efficacy? Initially, at least, there cannot be, for prehension was based on eternal objects, and the activity of causation could not be reduced to eternal objects. Earlier Whitehead had determined to bracket considerations of causality, and that resolution carried at least through *Science and the Modern World*.¹⁷

17 Thus he wrote: "It is evident that the ingression of objects into events includes the theory of causation. I prefer to neglect this aspect of ingression, because causation raises the memory of discussions based upon theories of nature which are alien to my own. Also I think that some new light may be thrown on the subject by viewing it in this aspect" (CN 146). Whitehead saw causation as allowing, if not bringing about the bifurcation into apparent nature and causal nature.

The discussion of causal efficacy first arose in *Process and Reality*, part II, chapters 4 and 8,¹⁸ which were probably initial studies for *Symbolism, Its Meaning and Effect*, lectures presented at the University of Virginia in April 1927. Initially *Symbolism* was conceived in terms of the themes of its final lecture, which are more conventional reflections on this theme. While he should have been preparing the other lectures, he was preoccupied with problems of perception. The genial idea of symbolic reference connecting the two pure modes of perception permitted him to present his novel ideas under the rubric of symbolism.

It is widely recognized *Symbolism* argues that Hume's analysis of causation cannot account for our immediate perception of causal efficacy. What is not generally recognized is its argument also implicitly criticizes Whitehead's own theory of prehension. To be sure, it does not challenge the notion of physical prehension as the conformation of the present to past actuality. This was not Whitehead's concept of prehension in the spring of 1927. It was first introduced in part III (D), probably in the fall or winter 1927. In the meantime Whitehead seems not to know what to make of the relation between prehension and causation, holding the term 'prehension' largely in abeyance for the time being.¹⁹

The earlier notion of prehension (in SMW) grows out of Whitehead's recognition of a sensum as an eternal object capable of characterizing many events at the same time. This generates the notion of prehension as an internal relation between two events connected by a common eternal object. As conceived from the standpoint of one of the two events, prehension can be best illustrated by means of perception:

18 Primarily II.4.5-8, II.8. 4.9 is a later insertion made in conjunction with the very late IV.4K concerning 'Strains'. II.8.1 follows directly upon PR 126.10.

19 'Prehension' seems to be absent from the basic text of the Giffords draft (C: roughly, part II). Not all mentions have been analyzed, but those which have appear to belong to later insertions.

green is not simply at A where it is being perceived, nor is it simply a B where it is perceived as located; but it is present at A with the mode of location in B. (SWM 70f).²⁰

This notion of a prehensive relation in terms of eternal object is given precise expression in "Time":

This prehension of A into B is a relational functioning with an individual character expressible in terms of eternal objects. (EWM 306)

This theory has the advantage over representational theories of perception in that the very same eternal object is both inherent in the event perceived and in the perceiver. It is not a replica or copy thereof.²¹ But can this concept of prehension sustain a robust sense of causation?

Whitehead argues against Hume's account of perception on the grounds of its inability to account for our experience in the mode of causal efficacy. Hume gives a full analysis of presentational immediacy, but this is not the whole story if there is also the experience of causal efficacy. In so criticizing Hume, Whitehead appears to be attacking his own earlier theory. While the datum of a prehension is not merely a copy or representation of some external reality, it was suspiciously like a Humean sensation in other ways. In both cases what is perceived is a sensum divorced from the actuality in question. Whether the sensum is understood realistically or representationally, the

20 I have analyzed this early concept of prehension in "Panpsychism and the Early History of Prehension," *Process Studies* 24 (1995), 15-33.

21 On the other hand, such prehension is based on the contrast between the particular actuality and the universal eternal object. It has the well-known difficulty of only being able to characterize the particular in terms of universals. Richard Rorty has further shown that an adequate theory of epistemological realism needs to distinguish between the unrepeatable event to be known and a repeatable element which can be ingredient in both the event and the knower. Without the unrepeatable event, there is nothing outside the knower to be known; without the repeatable element, there is nothing of the event which is also inherent in the knower. ("Matter and Event," EWP 68-103.) Whitehead was able to affirm epistemological realism by distinguishing between the unrepeatable act of becoming and the repeatable determinate being resulting from that becoming (PR 69). He did not yet have that distinction, which is at the basis of physical prehension. The process of working it out is the focus of this essay.

essential point is that the sensum is abstract. As abstract, it cannot carry the full weight of causation, which concerns the way one concrete actuality impinges upon another.²²

Hume reduced our experience of causation to contiguity, consecutiveness and constant conjunction. This may well be the best that can be done on the basis of building up everything from sensa. The same explanation of our experience of causation would have to be made if we were restricted to a notion of prehension based upon the transmission of a common sensum as eternal object. But Whitehead finds this inadequate to our sense of experienced causal efficacy.

Whitehead was opposed to the bifurcation of nature into causal and apparent nature, and so devised his philosophy of nature and early metaphysics to provide an alternative to causation. While for many purposes he could explain causation in terms of prehension, he found that he could not account for such phenomena as: "the light made me blink".

If we really perceive in the mode of causal efficacy, as well as in the mode of presentational immediacy, then the conclusion of *Symbolism* should be that we experience more than we canprehend. As then conceived, there can be no prehension of causal efficacy.

Since Whitehead assumes (at least at this point) that occasions are causally connected, prehension cannot be used to express that connection. Some evidence for that may be found in a very early passage (II.1.5).

Whitehead recognized that his "principle of universal relativity directly traverses Aristotle's dictum, 'a substance is not present in a subject'" (PR 50). The principle of relativity requires that every entity is involved, at least potentially, in every concrescence (PR 22, cat expl iv). It is originally derived from Whitehead's appreciation of the enormous versatility of the eternal object, for early prehensions, in virtue of common eternal objects, could relate every event to every other event. If so, he proposed as his

22 More broadly, the issue concerns the persistence of the concrete past into the present. Causation is really dynamic persistence. It may be wondered whether persistence can be fully understood in terms of the repetition of common eternal objects illustrating a succession of actual occasions.

project in *Science and the Modern World* that every event (later, every occasion) could be constituted by its prehensive relations with every other event. This would contravene Aristotle's dictum.

Whitehead continues:

On the contrary, according to this principle an actual entity *is* present in other actual entities. In fact if we allow for degrees of relevance, and for negligible relevance, we must say that every actual entity is present in every other actual entity.... The Aristotelian phrase suggests the crude notion that one actual entity is added to another *simpliciter*. This is not what is meant. One role of the eternal objects is that they are those elements which express how any one actual entity is constituted by its synthesis of other actual entities..." (PR 50).²³

This passage does not mention 'prehension,' yet it presupposes the early theory of prehension whereby actualities are related solely by eternal objects. In a way, this explains too much, for it does not, and perhaps cannot specify a criterion for distinguishing between causation and some weaker form of influence between occasions. An eternal object is an eternal object the world over, and it makes no difference with respect to its nature whether the occasion it exemplifies is near or distant, massive or negligible in its influence. The eternal object per se lacks causal power. It is abstract, and cannot convey the full concreteness of an actuality within another. On the other hand, if the inclusion is too concrete, what prevents it from being simply the crude addition of one actuality to another?²⁴ The problem is recognized, but not yet resolved.

6. Datum, Process, Satisfaction, Decision

Clearly the unsettling discovery that the initial theory of prehension cannot account for causation requires a major reconstruction of how an actuality comes into being. Prehensions as then conceived were inadequate to the task, for they abstracted from the activity of causal efficacy. Whitehead struggled with this problem all through

23 For a further examination of this passage, see Sheilah O'Flynn Brennan, "Substance within Substance," *Process Studies* 7/1 (Spring 1977), 14-26.

24 In terms of Rorty's distinction, crude addition would be the impossible inclusion of an unrepeatable in another unrepeatable.

the Giffords draft,²⁵ finally achieving a satisfactory solution with the advent of part III. Most of his reflections are rather furtive, for he had little confidence in his preliminary attempts. There is, however, one major effort at the determination of a theory of actualization (PR 149.41-150.31):

The four stages constitutive of an actual entity²⁶ ... can be named datum, process, satisfaction, decision. The two terminal stages have to do with 'becoming' in the sense of the transition from the settled actual world to the new actual entity relatively to which that settlement is defined. (PR 149f)

In the revised theory of concrescence exemplified in part III there is a single process of unification proceeding from the many physical prehensions to the one satisfaction. At this point, however, there is a two-step process: efficient causation transmitting the basic datum from which an internal process fashions the satisfaction. 'Transition' becomes his technical word for the first stage, but it is not yet used technically.²⁷

Although the account of the process between datum and satisfaction is expanded, both here and later (PR 153-155; 211-214), the account of the transition from occasion to occasion is terse in the extreme.

25 Giffords draft is my name for those writings Whitehead originally intended to present in Edinburgh (roughly, part II). These are not the final lectures. What he actually delivered included a further, revised theory of concrescence (part III), as well as other things, such as the final chapter on God (EWM 325-27).

26 In the ellipsis Whitehead says that these four stages have already been stated in "Part II, Chapter III, Section I." I have been unable to locate them there or elsewhere.

27 In his revised theory of concrescence in part III, physical prehension assumes the role of transition. It is the means whereby past actualities are immanent within a concrescence. Hence the role of 'transition' in conveying such data to the present occasion becomes superfluous, and is largely dropped from Whitehead's theory.

I should emphasize that I mean by 'transition' how Whitehead used the concept in his own (early) theory. There are other, quite useful meanings for 'transition' in the process literature, but they are not Whitehead's. They have been fashioned to be consistent with Whitehead's final theory, while Whitehead mostly abandoned the notion when he came to fashion his final theory.

The 'settlement' which an actual entity 'finds' is its datum. It is to be conceived as a limited perspective of the 'settled' world provided by the eternal objects concerned. This datum is 'decided' by the settled world. It is 'prehended' by the new superseding entity. (PR 150)

The transition, here termed the 'decision', constitutes the datum from which the internal process proceeds. This decision is achieved for the occasion; it is not something the occasion effects by its integration of prehensions. In this context 'prehension' merely means the reception of what is given for the occasion.

Later, concrescence initiates with a multiplicity of data belonging to the physical prehensions, but here "the new concrescence starts from this datum" (PR 150).²⁸ The use of datum with respect to individual prehensions seems to arise first with the revised theory which fuses transition and concrescence together. Transition replaces the earlier notion of a physical occasion. It was based on prehensive unification with the seat of activity located in the prehending occasion. Causation, however, located the seat of activity in the causing occasion. This requires an adjustment in the understanding of prehensive unification.

The final stage, the 'decision,' is how an actual entity, having attained its individual 'satisfaction,' thereby adds a determinate condition to the settlement for the future beyond itself. Thus the 'datum' is the 'decision received,' and the 'decision' is the 'decision transmitted.' (PR 150)

Note that 'decision' is not primarily based on subjective deliberation; a terminal stage it lies outside the subjective stages of process and satisfaction. He refers to "its root sense of a 'cutting off'" (PR 43). Possible alternatives are excluded in rendering the occasion determinately actual. Such determination is necessary for actualization, but subjectivity is not necessary for determination.

If a distinct stage from satisfaction is required, satisfaction is not yet understood as inherently objective. On the contrary, satisfaction is the subjective completion of the

²⁸ Later 'concrescence' will be restricted to the internal process of the occasion, but in this context it probably refers to all four stages constitutive of an actual entity. Starting from the datum it includes not only the process and satisfaction, but also its 'decision' whereby it contributes itself to the superseding datum.

inner process. 'Decision' then renders this subjective satisfaction into an objective state accessible to successor occasions. To be sure, Whitehead ultimately concludes that the satisfaction is beyond the internal activity of the occasion (PR 85),²⁹ but this is based upon a further implication of the distinction between being and becoming which was not yet fully appreciated by Whitehead.

Later we shall see how becoming is identified with concrescence, and being with the resultant concrete determinateness. Was satisfaction being or becoming? It had been considered the final phase of becoming. In a sense satisfaction could be considered both becoming and being, but ontologically these are exclusive categories. If so, it must be being. Becoming is a process unifying many feelings, which terminates in a final unity. If unity is convertible with being, unification is convertible with becoming. After that distinction was made between being and becoming, satisfaction could be treated objectively (or superjectively) as being, but during the writing of the Giffords draft and beyond, it was understood subjectively in terms of becoming.

There are only a few places in which Whitehead explicitly mentions a 'subjective satisfaction.' In contrasting his position with Kant's, we learn that "the philosophy of organism seeks to describe how objective data pass into subjective satisfaction" (PR 88).

The 'prehension' of one actual entity by another actual entity is the complete transaction, analysable into the objectification of the former entity as one of the data for the latter, and into the fully clothed feeling whereby the datum is absorbed into the subjective satisfaction --'clothed' with the various elements of its 'subjective form.' (PR 52)³⁰

29 Though the paragraph spanning PR 84f and its successor belong to "The Order of Nature" (II.3), one of the basic chapters of the Giffords draft, they bear the marks of very late insertions. Notice the repetition of Plato's phrase, it "never really is" in both the surrounding context (PR 84.38) and in the insertion (PR 85.8). In making the insertion Whitehead apparently paid little heed to the immediate context.

30 This passage is probably part of a larger insertion PR 52.8-18a into II.1.6, whose original text is probably very early, before Symbolism. Its use of 'subjective form' (late C; see EWM 205-207) but particularly 'positive _prehension' and datum for particular feelings (both D) indicates that 'subjective satisfaction' extends into his revised theory of concrescence. The satisfaction isn't immediately seen as a unified being and hence as objective.

Another mention, late in the Giffords draft, states:

Cognizance belongs to the genus of subjective forms which are admitted, or not admitted, to the function of absorbing the objective content into the subjectivity of satisfaction. (PR 160)

While not mentioning it by name, another passage describes the subjectivity of the satisfaction:

'process' is the rush of feelings whereby second-handedness attains subjective immediacy; in this way, subjective form overwhelms repetition, and transforms it into immediately felt satisfaction; objectivity is absorbed into subjectivity. (PR 155)

He compares his approach with Kant's:

Thus for Kant the process whereby there is experience is a process from subjectivity to apparent objectivity. The philosophy of organism inverts this analysis, and explains the process as proceeding from objectivity to subjectivity, namely, from the objectivity, whereby the external world is a datum, to the subjectivity, whereby there is one individual experience. (PR 156)

There would be little reason for Whitehead then to have anticipated that he himself would come to hold to an objective view of 'satisfaction.' Since the reasons for the contrast between (subjective) becoming and (objective) being do not arise until the conceptual revolution ushering in part III, I think we can safely interpret all mentions of 'satisfaction' in the Giffords draft in subjectivist terms.

A subjective satisfaction is purely internal, it cannot affect subsequent occasions. Once satisfaction is treated as a determinate prehensible being, objectification is largely unnecessary, but at this stage it is essential to the theory.³¹ Although in some contexts it is termed 'decision'(e.g. PR 150), Whitehead usually refers to it as 'objectification':

The doctrine of objectification is an endeavour to express how what is settled in actuality is repeated under limitations, so as to be 'given' for immediacy. (PR 137)

31 That is, the objectification of the occasion as a whole, and as contributing to the new datum. In part III it is used primarily with `respect` to individual feelings (PR 226, 235, 245, 246).

One of those limitations was that the past be given in terms of a single datum:

how the actual particular occasions become original elements for a new creation is ... objectification. The objectified particular occasions together have the unity of a datum for the creative concrescence. (PR 210)

Once physical prehension is introduced, the prehending occasion appropriates its data and integrates them into its final satisfaction. Objectification then merely names the converse of prehension. Normally we restrict the function of objectification to rendering the individual occasion objective, leaving any further integration to the dynamics of concrescence. But the exigencies of his earlier theory called for the unity of a single datum from which the inner process proceeds. This meant that objectification must perform a two-fold task. It not only objectifies prior occasions, but presents them to the new occasion in a fully unified manner.

This two-fold role of objectification was described as 'decision':

The decision, providing the datum, is a transference of self-limited appetite; the settled world provides the 'real potentiality' that its many actualities be felt compatibly;³² and the new concrescence³³ starts from this datum. (PR 150)

If objectification was limited to rendering the prior occasion objective, and there were no prehension of others, how would a nascent occasion receive any content? Instead of prehension, discredited in any causal role, Whitehead introduced objectification in this double aspect. The many objectified past occasions are unified together into a single datum.

32 This anticipates the first categoreal obligation that the many feelings of an incomplete phase be compatible for integration (PR 223). See also PR 154.

33 'Concrescence' here seems to refer to the entire process of concretization, starting from the datum, process, satisfaction, and the contribution of that concrete event to the datum of its successor. 'Process' is the subjective portion of this activity. We shall refer to this 'process' as the 'inner activity' or 'concrescence' of the occasion, but strictly speaking 'process' seems to be Whitehead's preferred designation. To be sure, later in the final chapter of the Giffords draft, he does contrast 'transition' and 'concrescence' ____ (II.10).

Surely this has the same many/one structure of prehensive unification (in SMW), but with one difference. Strictly speaking, the earlier form of prehension is symmetrical. Either event is related to the other in exactly the same fashion, i.e. in terms of the common eternal object. It is only for our practical purposes in interpreting prehension as in e.g. perception, that one event is favored over the other.

Causation introduces further considerations. Traditionally causal activity is vested in the cause, and Whitehead has no grounds initially to challenge that. This is precisely the stuff of causal efficacy; of our conviction that "the light made me blink". If so, prehensive unification, vesting unitive activity in the subject, does not appear to accommodate causation vesting causal activity in the many causes.

Thus in objectification we have prehensive unification, qualified by placing causal activity in the causes: "The final stage, the 'decision,' is how the actual entity ... adds ..." (PR 150). It may be interpreted as only contributing an element to the resultant datum, but how is that element selected and how is everything unified?

This remains rather obscure. How an occasion could prehend a many into its unity is fairly clear, but how many occasions can conspire together to provide a unified datum, particularly when that occasion does not yet exist, is difficult to see. For the time being it appears that Whitehead simply left this aspect of his theory alone, and concentrated on determining the nature of concrescence which could proceed from a single datum.

7. The Datum of Concrescence

That process, or concrescence, should start from a single unified datum (PR 150) is the most distinctive feature of the Giffords draft, only to be eliminated in the revised theory of part III. It holds as long as relations between occasions, and relations within occasions, flow in opposite directions. The early theory of prehensive unification (in SMW) flowed from past occasions to the present occasion, but since its prehensions abstracted from all activity, awkward questions about causation did not arise. Causal efficacy changed all that. Relation required the activity of relating, either causal activity vested in the causes 'prehended' or unitive activity in the resultant subject.

In the Giffords draft Whitehead initially proposed vesting that activity in causative actualities. His final decision placed the unitive activity in the concreting subject, but only after prehensions or feelings were conceived to reach from past actualities to the concreting subject, on the strength that this act of being was indivisible (PR 69). In the meantime he operated with a two-step process of unification, first the establishment of a datum, then of the (subjective) satisfaction.

The need of a datum from which concrecence flows arises from the fact that the relations proceed in opposite directions. The datum is built up by causative activity on the part of the many, which achieve their unity apart from the unitive activity of the one subject. If there were flow in only one direction, as in the earlier theory of prehensive unification (SMW), there would no need for an intermediate unity.

Whitehead had assumed, traditionally, that subjective activity requires being. Later, a single indivisible act of becoming can postpone that being until satisfaction, but some sort of being, introduced by the datum, was then required:

There is the becoming of the datum, which is to be found in the past of the world; and there is the becoming of the immediate self from the datum. This latter becoming is the immediate actual process. (PR 150)

The self is differentiated from the datum as subject of this object, and as in becoming to the datum's being. Becoming here is contrasted as dynamis to stasis; it is the becoming of a being, not a process of becoming (unification) which terminates in being (unity). There is a common being of which datum and self are its interdependent aspects.

Other than the passage examined in the previous section (PR 150), there are few places where the notion of an originative datum is explored. In particular Whitehead makes very little mention of how occasions are related to causal occasions, for it apparently proved very difficult to work that theory out in any satisfactory manner. Thus in place of mental occasions superseding physical occasions, he restricted himself to working out the internal activity of the occasion, starting from its originative datum.

This originaive datum is mentioned frequently, but more in passing, incidental to other concerns. It forms the background for the Giffords draft, but its presence is often difficult to discern. Here are some examples taken at random:³⁴

this datum, which is the primary phase in the process constituting an actual entity (PR 65)

No actual entity can rise beyond what the actual world as a *datum* from its standpoint--its actual world--allows it to be. Each such entity arises from a primary phase of the *conrescence of objectifications* which are in some respects settled. (PR 83)

The character of an actual entity is finally governed by its datum; whatever be the freedom of feeling arising in the conrescence, there can be no transgression of the limitations of capacity inherent in the datum. (PR 110)

the relevance to other actual entities of its own status in the actual world is the initial datum in the process of its conrescence. (PR 152)

8. The Dissolution of the Datum

The datum plays such a significant role in his early theory of conrescence because it marks the boundary between the causal activity of other occasions and the initiation of mental activity within the occasion. Though Whitehead does not characterize it as an atomic datum, it is not conceived as physically divisible throughout the Giffords draft. Once the datum of conrescence is deemed to be divisible, the resultant data could be conceived in terms of the past occasions themselves, suggesting the notion physical prehensions, which form the basis for the revised theory of conrescence (part III).

Until then, the datum is a barrier to further inquiry.

The convergence of causal influences upon a non-existent or not-yet-existent occasion, which seems to be required if we try to conceive prehensive unification in terms of active causes (PR 150), does not seem to be very promising. Nevertheless Whitehead persists in this notion of an original datum for a considerable time.

34 See also EWM 188-191, 201-203.

On the other hand, there must be a way of explaining how analysis of the indivisible datum is possible. There cannot be, he thinks, any sort of physical division; so it

is not a selection among the components of the objective content; for, by hypothesis, the objective content is a [single] datum (PR 154).

Instead Whitehead proposes conceptual abstraction:

the selection is a selection of relevant eternal objects whereby what is a datum from without is transformed into its complete [internal] determination as a fact within. The problem which the concrescence solves is, how the many components of the objective content are to be unified in one felt content with its complex subjective form. This one felt content is the 'satisfaction'... (PR 154)

The role of transforming the datum from without into a fact within is assigned to conformal feeling. The eternal objects abstracted from the unitary physical datum are then integrated together into one satisfaction. Yet the satisfaction, on this early theory, contains nothing but eternal objects, unless the subjective forms involved are considered to form a distinct category. As such it lacks the concreteness necessary for effectiveness.

Abstraction is not the division of the concrete, because the components do not participate in the concreteness of that which is indivisible. It can be abstractly analyzed, but not divided. By the same token, however, the synthesis of these abstract elements, because they are not concrete components, cannot achieve the concreteness needed.³⁵

The problem is that if the original datum were spatiotemporally atomic, it could not be modified, and so could not be transformed by the mental concrescence. Moreover, it is as physical that the occasion influences other occasions. The mind affects other actualities only through its associated body, the physical side of the occasion. Unless it is possible to determine how mind affects the body, mind cannot affect other occasions. Only the spatiotemporal aspect of the occasion can do so. But if the datum were atomic

³⁵ This is but an application of Whitehead's general rule: "It is a complete mistake to ask how concrete particular fact can be built up out of universals. The answer is, 'In no way'" (PR 20).

and could not be modified, then it would be identical with the decision transmitted. If this were so, how is freedom or individuality to be explained?

Whitehead does allow for the internal determination of the occasion to achieve its own individuality:

The datum, *qua* mere datum, includes the many individualities of the actual world. The satisfaction includes these many individualities as subordinate contributors to the one individuality. (PR 154).

The indeterminations as to the way the many individualities of the past become part of the final determinate individuality are finally resolved in the process of determination, but such concrescence does not affect the originative datum, nor the way it affects subsequent occasions.

For concrescence to transform what is initially given, or for the satisfaction to affect subsequent occasions, the indivisibility of the datum of concrescence must be abandoned. If the concrescence is to be an integration of physical and conceptual feelings, and not just of conceptual feelings alone, there must be an initial multiplicity of physical feelings.

This dissolution of the datum, however, meets considerable resistance. For while datum and subject are contrasted, they are aspects of a common being. Being presupposes unity, and there is no initial unity to concrescence apart from its datum. Once the theory of concrescence is revised, such that the occasion initially prehends the many past occasions, it becomes possible to consider subjectivity as pure becoming which has no being. For while an occasion starts with the many beings of the past, it has no unified being of its own until satisfaction. Prior to that revision, however, it is assumed as a matter of course that a subject must have being in order to act, and the originative datum forms the objective side of that subject's being.

In spite of this, the one datum was ultimately dissolved into many data,³⁶ and this seems to have come about, at least in part, by a reconception of the role of the mental

36 There are some transitional expressions, such as "the complexity of the datum" (PR 165) and the "multifold datum" (PR 185). Once the datum of concrescence is

conrescence. At one point, at least, he conceived its role primarily as emotional. The role of the datum, most generally, was to transmit this raw emotion to the occasion:

The primitive form of physical experience is emotional-- blind emotion--received as felt elsewhere in another occasion and conformally appropriated as a subjective passion. (PR 162)

Then the occasion refines this subjective response as its individuality:

The conformal stage merely transforms the objective content into subjective feelings. But the supplementary stage adds, or excludes, the realization of contrasts by which the original datum passes into its emotional unity (PR 165).

In one of the later stages of the Giffords draft, Whitehead introduces the concept of the subjective form. This can best be seen in terms of one section of "The Subjectivist Principle" (II.7.4). The latter part (roughly, PR 165f) makes no mention of 'subjective form' whereas the earlier part (PR 163f) refers to it several times. It looks most probable that Whitehead wrote the latter part first, then prefaced it with the earlier part on 'subjective form' because he found this concept expressed his views more precisely.³⁷

What was later termed 'subjective form' seems to have been conceived originally as a response to a conformal feeling, which had merely registered the emotion physically felt. It had no affect of its own, for the response would be a later feeling, which comes about by a "realization of contrasts". Now, however, the subjective form was a factor in each feeling.

If, however, *every* feeling has its own subjective form, what is the purpose of the mental process? It is not particularly a subjective response to an objective content. Stripped of this role, it begins to look suspiciously like prehensive unification. This is problematic for two reasons: a second prehensive unification besides the transition effecting the unity of the datum seems redundant, and a unification must start from a many data, not one datum.

abandoned, the term 'datum,' as well as the distinction between the initial and the objective datum, is transferred to individual feelings. Now a prehension is conceived as having a datum, subject, and subjective form.

37 See EWM 205-207 for an analysis of II.7.4.

A section inserted into "From Descartes to Kant" (II.6.5) may indicate the shift that occurs with the introduction of 'subjective forms'.³⁸ Its underlying stratum is couched in terms of 'process'. I quote part of it:

Thus process is the admission of eternal objects in their new role of investing the datum with the individuality of the subject. The datum, *qua* mere datum, includes the many individualities of the actual world. The satisfaction includes these many individualities as subordinate contributors to the one individuality....

The process can be analysed genetically into a series of subordinate phases which presuppose their antecedents. Neither the intermediate phases, nor the datum which is the primary phase of all, determine the final phase of determinate individualization. (PR 154)

The purpose of the process is individualization. Yet it has the abstract form of a prehensive unification, apart from its originative datum. Moreover, Whitehead comes to see that individualization can be achieved in terms of subjective form. Against the term 'individualization' he wrote in the margin of his copy "= subjective form."³⁹ After 'subjective form' was introduced, and the role of subjective response dropped, the process was now termed 'conrescence,' perhaps because Whitehead now saw it as the primary instance of prehensive unification.

At any rate, in "Process," the final chapter of the Giffords draft (II.2), conrescence is contrasted with transition. In the "transition from particular existent to particular existent" (PR 210), the many particular existents contribute to the datum of the new occasion (and thereby cause it to come into being). Conrescence itself unifies the many it receives.

38 As the text presently stands, the chapter on "From Descartes to Kant" appears to have three more systematic insertions: (a) one in II.6.3a (149.1-12), (b) a second in II.6.3b (149.41-151.15), and (c) a third in 6.5a (153.22-155.17). We considered the second in section 6 on "datum, process, satisfaction, decision", and examine the third here. Apart from these passages, the chapter is an historical commentary on Descartes, Locke, Hume, and Kant.

39 Editors' Notes to the corrected edition at PR 154.21.

Whitehead states this theory of transition with deliberate vagueness:

The creativity in virtue of which any relative complete actual world is, by the nature of things, the datum for a new concrescence is termed 'transition'. (PR 211)

Though couched in a different terminology, this is basically his earlier theory of 'decision':

The decision, providing the datum, is a transference of self-limited appetition; the settled world provides the 'real potentiality' that its many actualities be felt compatibly, and the new concrescence starts from this datum. (PR 150)

How such 'objectification' is possible, how many occasions together can establish a unified datum, is not explored, either in the earlier or later accounts. The chapter on "Process" projects an introductory section, several sections on 'concrescence,' several on transition, and a conclusion--except that the sections on 'transition' were never written. Whitehead may never have worked out a satisfactory theory of transition. At any rate the whole issue was superseded by the revolutionary implications of the revised theory of concrescence in part III.

It is not possible to ascertain whether the following preface to the 'individuality' insertion (PR 154) was made before or after the concrescence-transition contrast (PR 210f), but it hints at difficulties with the single datum theory, once concrescence was conceived as the unification of the many. The expansion includes this paragraph:

Again⁴⁰ the selection involved in the phrase 'selective concrescence' is not a selection among the components of the objective content; for, by hypothesis, the objective content is a datum. The compatibilities and incompatibilities which impose the perspective, transforming the actual world into the datum, are inherent in the nature of things.... The problem which the concrescence solves is,

40 Whitehead often begins insertions with 'again'. In this case it would be a secondary insertion within the larger insertion of 153.22-155.14. (The next three sentences appear to be a transition bridging the systematic insertion and the commentary on Kant.)

how the many components of the objective content are to be unified in one felt content with its complex subjective form.... (PR 154)⁴¹

If it is only by hypothesis that the objective content is a datum, then this can be questioned. When it is said that the reasons for anything are "inherent in the nature of things," we may wonder whether those reasons can ever be stated. This transformation of "the actual world into the datum" is objectification as put forth in the Gifford lectures, partly in order to resolve these potential incompatibilities. Later, Whitehead finds a way to reformulate its concerns about incompatibilities in terms of the first categorial obligation (PR 223), removing this obstacle to the dissolution of the datum.

There seems to be no passage in which the theory of an originative datum is explicitly criticized, although Whitehead is cognizant of "the complexity of the datum" (PR 165), and describes concrescence as the way "the multifold datum of the primary phase is gathered into the unity of the final satisfaction of feeling" (PR 185). Datum may have come to mean less the unity achieved by transitional objectification and more simply that which has been received from the past. In any case the Giffords draft, understood approximately as the initial version of part II before insertions,⁴² is couched uniformly in terms of 'datum'.

9. The Birth of the Physical Prehension

The instrument effecting the successful revision of concrescence is the physical prehension. It first makes its appearance in part III. 'Prehension,' although it was first introduced in *Science and the Modern World*, is largely absent from part II. As earlier used, prehension was a way of relating two events by means of a common form.⁴³ Since it

41 The end of the paragraph describes the swing from the privacy of satisfaction to the publicity of 'decision' (objectification). "Time has stood still--if only it could." With the later theory of becoming and being, the apparent paradox with respect to the satisfaction is resolved.

42 It also includes I.1, "Speculative Philosophy," and V.1 "The Ideal Opposites".

43 "Panpsychism and the Early History of Prehension," *Process Studies* 24 (1995), 15-33.

is based on the abstraction of eternal objects, it was not a suitable vehicle for efficient causation. In particular, it could not account for the perception of causal efficacy. Thus in the Giffords draft Whitehead sought to accommodate the exigencies of efficient causation by means of transition or objectification producing the original datum from which concrescence flowed. In this way prehension (now called feeling) could be reserved for the analysis of concrescence separated from any efficient causation. Physical prehension changed all that.

What led him to devise the notion of physical prehension? It was quite possibly the most revolutionary concept of all, changing the way we understand efficient causation within a process context. My reconstruction must be tentative and speculative. There are many factors contributing to this concept, factors working together in ways which make it difficult to determine the probable order of Whitehead's reflections. But we can make some guesses:

(1) **Datum reconceived as data.** The datum from which concrescence springs was initially conceived as a very tight unity, possibly even an indivisible unity, although Whitehead stops short of ever claiming that. It represented the being of the occasion on its objective side, allowing the subject of its feelings to be the being subjectively considered. This unity was never abandoned, but it became considerably more relaxed. Concrescence came to be understood as the unification of many conformal feelings transforming the one datum into a multiplicity for concrescent unification. This raised the possibility that concrescence could possibly start with a multiplicity, particularly if "datum" was interpreted as "that which is received for experience," regardless of whether it was unified or not.

An early insertion within the Giffords draft expresses this shift, although it does not yet mention 'physical prehension,' nor does it identify the 'data' with past occasions.

The concrescence, absorbing the derived data into immediate privacy, consists in mating the data with ways of feeling provocative of the private synthesis. These subjective ways of feeling are not merely receptive of the data as alien facts;

they clothe the dry bones with the flesh of a real being, emotional, purposive, appreciative.... (PR 85a)⁴⁴

Earlier conformal feelings would have converted the objective datum into subjective data, but here the data by themselves are "alien facts".

On the other hand, the implication is not yet made that these data could be the past actualities themselves. Before Whitehead encountered the difficulty causal efficacy posed, prehensions connected actualities. Now prehensions and prehensive unification were reconceived in terms of feelings, which in the Giffords draft were restricted to the subjectivity of concrescence.

Yet later in this same insertion Whitehead writes:

the conceptual ingression of the eternal objects in the double role of being germane to the data and of being potentials for physical feeling....The subjective forms of the prehensions in one phase of concrescence control the specific integrations of prehensions in later phases of that concrescence. (PR 86)

The neat division between feeling (within the occasion) and prehension (between occasions) is now abandoned, as the terms seem to be used interchangeably. Yet we should not conclude that 'physical feeling' is used in the way it is later used. It seems that even here physical feelings are being mediated by way of eternal objects. The idea that such data are not simply complex eternal objects is not yet present.

(2) Data as past occasions objectified. If the datum is not a single unity, to be explained in terms of a transitional process of objectification, then objectification may no longer refer to the past as a whole but to individual past occasions. Such objectification appears to have minimal requirements: unity and determinateness. From a later perspective these requirements are seen to have been met by the satisfaction.

(3) Causal feelings. It is possible that Whitehead tried to pluralize his conception of transitional objectification in terms of a multiplicity of relations between the causal past and the present occasion. Each relation could consist of the causal influence of a past occasion with its respective conformal feeling. While the initial datum would be the

44 The insertions appear to run from 85.27b or .28 to 86.11.

remote occasion, the objective datum it causes would be the same as the initial datum of the conformal feeling. Thus we would have a datum at the end of the causal influence and at the beginning of the conformal feeling. For the causal feeling causes the datum that the conformal feeling feels. This sort of intermediate datum is reminiscent of the ancient theory of perception whereby what is perceived lies midway between the perceiver and the thing causing the perception.

I am construing 'causal feelings' in terms of active causes, although later, to make his theory consistent, he stipulates that "simple physical feelings will also be called 'causal' feelings" (PR 236E). Only one short section (III.2.2C+) is devoted to causal feelings (PR 239f), and only one sentence suggests that causal feelings analyze prehension in the mode of causal efficacy. Yet there is probably some good reason why Whitehead replaced 'causal feeling' with 'physical feeling'. I conjecture that instead of the many occasions together causing the datum, causal feelings from each caused the many data of the initial phase. Consider this excerpt:

An actual entity in the actual world of a subject *must enter* into the concrecence of that subject by some simple causal feeling, however vague, trivial, and submerged....⁴⁵ The actualities have to be felt, while the pure potentials can be dismissed. (PR 239C+, italics mine)

Instead of the later language, in which later subjects prehend earlier ones, the accent of activity is here placed upon the earlier occasion: That actual entity "must enter" into the concrecence.

The second sentence generalizes the meaning of "the light made me blink," the central characteristic of causal efficacy. Whitehead tries to retain the thrust of this claim in his notion of physical prehension, even though the locus of activity shifts from what had been the cause to what had been merely effect: "The actualities *have* to be felt, while the pure potentials *can* be dismissed" (PR 239).

(4) Causal feelings become physical prehensions. If the theory of causal feelings invested the cause with activity, it was short lived. The theory of the Giffords

draft was able to separate transition from concrescence by means of the original datum. Objectification by means of causation effected the datum, which feelings could analyze and appropriate. The datum effectively sealed off causal feelings from concrescent feelings. Once it was dissolved, however, nothing stopped the many initial concrescent feelings from being joined to individual causal feelings.

If so, the incompatibility between causal and concrescent feelings would be immediately obvious. In causation, A causes B. That same relation is understood in terms of prehension as B prehending A. A causal feeling which functions as a cause is at loggerheads with the prehension to which it is conjoined. If, however, the causal feeling came to be understood not as a *cause*, but as the *feeling* of an active subject, then the causal feeling and the conformal feeling would face the same direction. Then there would be no need for two distinct feelings, and any function for any intermediate datum would disappear.

(5) Physical prehensions. Then there is a feeling with concrescing occasion as its subject and the past actual occasion as its datum (at least as its initial datum). Heretofore Whitehead had been elusive about relations between occasions, other than causal feelings, but now he sees that it would be possible to rehabilitate 'prehension,' because the new 'physical prehension' feels actualities and not mere eternal objects. This was what causal efficacy required, at least in part. "The actualities *have* to be felt, while the pure potentials *can* be dismissed" (PR 239). This is the distinction between physical prehensions and conceptual feelings. Unlike with ordinary causes, this is a distinction within the same genus of feelings. Since negative prehensions are not felt, Whitehead identified feelings with positive prehensions alone.⁴⁶ This connects the feelings within the concrescence with prehensions between occasions.

45 I take the omitted portion (PR 239.16b-21a), together with 240.9-17) to be later, 'negative prehension,' additions.

46 This consideration may have prompted the insertion introducing the distinction between positive and negative _prehensions. See PR 41.15b-42.4, prefaced by a possibly later insertion (PR 40.37b-41.15a) designed to make a more effective transition.

(6) Prehension's presupposition. Under the earlier theory of prehension (SMW), one occasion prehended its predecessor only in terms of a complex eternal object. Now, however, how was it possible that the occasion itself could be prehended? In a brilliant early essay, Richard Rorty has shown us the way.

Realism requires that we experience a past actuality itself, and not some replica thereof. However, it must be possible for that actuality to be present in our experience. Yet if the actuality were immanent, how is there also the actuality transcending our experience "out there"? Aristotle sought to solve the problem with the hylomorphic distinction. The transcendent actuality "out there" was a combination of form and matter, while the mind experienced its form alone.

The problem with this solution lies in the nature of form. What is purely formal is not absolutely particular, as the original actuality is. This, we may note, is exactly the problem with Whitehead's earlier (SMW) theory of prehension. What is communicated in the prehension is a complex eternal occasion, not the particular actuality.

The revised theory of concrescence enables us to consider the problem in temporal terms. Rorty introduces the distinction between unrepeatability and repeatability. An actual occasion in its concrescing is an irreducibly particular actuality. That concrescing is indivisible and imprehensible. Yet once it has become a concretely determinate particular, it is repeatable. As objective it can be prehended by supervening occasions. Note that it is then actual in a different sense from concrescent actuality. It is particular, and not reducible to eternal objects. It is not atomic, but contributes to the constitution of extensive continuum insofar as it has been actualized.

Whitehead worked out the implications of this new theory of physical prehension in part III. The distinction between becoming and being now comes into focus. In the earlier theory, the past causes the original datum, which initiates the being of the occasion. The becoming is dependent on being. If, however, the concrescence starts with a multiplicity of physical prehensions which are unified in the final satisfaction, there is

no being for the concrescence until the final unity. Here the resultant being is dependent upon the becoming.

This means that for Whitehead the final satisfaction should be regarded as being, since it is not unification but unity. Then the satisfaction is transformed from the subjectively felt unity of feeling into an objective datum for subsequent prehension. This, however, is not immediately recognized (PR 52).⁴⁷

Whitehead never comments on this next point, but his new theory redescribes the objective present. What we immediately perceive is usually thought to belong to the present. It is then possible to think that all activity belongs in the present, including causes. The external world causes us to have the perceptions we have. Its objectivity can be distinguished from the subjectivity of our perceiving and responding. Both occur in the active present.

On that assumption Whitehead had devised the theory of causal objectification, and of causal feelings. In superseding those theories with physical prehension, he implicitly redescribes the objective present as the immediate past. It is now considered to have the properties of the past, including inertness. It is now the prehending subject, and not the cause it prehends, which is the locus of activity.

By reconceptualizing concrescence to include physical prehensions, Whitehead discovered a way whereby mind can influence the "body". (In this context we mean by body the physical pole of an occasion.) If we postulate many physical feelings at the outset of concrescence, then mentality can be the means whereby these physical feelings are ordered and unified. The many physical feelings become the one final satisfaction by means of conceptual forms devised for the occasion.

If becoming brings about being, it clarifies the relation between perishing and objective immortality. The phrase 'objective immortality' is first used in the essay on "Time" (1926):

This prehension of A into B is a relational functioning with an individual character expressible in terms of eternal objects. These eternal objects, thus

47 See note 30.

functioning, determine the objectification of A whereby it becomes a constitutive element in the concrescence of B. (EWM 306)

By 'prehension' Whitehead means his earlier notion mediated by eternal objects, for he has not yet faced the challenge of causal efficacy.

Hence each occasion A is immortal throughout its future. For B enshrines the [physical] memory of A in its own concretion, and its essence has to conform to its memories. Thus physical memory *is* causation, and causation *is* objective immortality. (EWM 306)

Whitehead does not explicitly introduce 'perishing' with respect to his own theory, but one statement is very instructive: "By Locke, the phrase 'perpetually perishing' is used in the same sense as 'supersession' here" (EWM 303).

We have seen that supersession means replacing one spatiotemporal quantum by another. Thus

the past fades,... time is a 'perpetual perishing.' Objectification involves elimination. The present fact has not the past fact with it in any full immediacy. The process of time veils the past below distinctive feeling. (PR 340)

Such perishing means that new occasions block out their predecessors; nevertheless the predecessors have objective ingreience in those to come. This objective immortality is given categorial status in the fourth category of explanation (PR 22).

So far 'perishing' and 'objective immortality' are simply juxtaposed. There is the conjunction of the occasion and its objectification (see e.g. PR 60, 82). Though both are needed, there is no intrinsic connection.

The conceptuality of becoming and being provides just such a connection. The act of becoming for any finite occasion is a process of unification. Unification ultimately results in unity. Were it not so, it would be a process of integration but not itself a unification. Moreover, by that act of unification it attains the unity of a new being. There cannot be a new being without the perishing of its becoming. What has being is objectively immortal; it is that which exists for others.

Insofar as becoming is identified with subjectivity, there is the perishing of subjective immediacy in the attainment of objective immortality. The metaphor of

'perishing' can be used to understand the relation between subject and object. There need be no insuperable gap between them, if they characterize present and past aspects of the same actuality.

Whitehead did not immediately recognize the nature of subjective perishing. Satisfaction, the unified being of concrescent becoming, was still conceived of as subjective throughout much of part III.⁴⁸ The key paragraphs arguing that satisfaction is outside concrescence appear to be very late insertions (PR 84f).

10. The Atomicity of the Act of Becoming

For years I believed that the Zeno-like argument for the atomicity of the act of becoming (PR 68f) prompted the shift.

The earlier theory had required a succession of two acts of unification for actualization, first transition, then concrescence. If there could be only one act of becoming, one act of unification, then this theory would have to be overhauled.

This assumes that the Zeno-like argument was prior to the conceptual revolution. It had not occurred to me that it might come later. Insertions often do not immediately indicate where they fall in the order of composition. Now, in the light of a passage which we will shortly examine (PR 227), it is far more likely that this celebrated account of atomicity (PR 68f) is the result of difficulties his revised theory of concrescence encountered, rather than its cause.

(1) The Difficulty: PR 227. In developing the new theory, Whitehead postulated three categoreal conditions.⁴⁹ In the course of explaining the second category of Objective Identity, he asserts that "The actual entity is divisible, but is in fact undivided" (PR 227). Does this mean that Whitehead has given up his central tenet that the actual entity is in some sense absolutely indivisible? Atomicity does not usually mean that the atom just happens not to be divided.

48 See note 30 to PR 52a.

49 Later expanded, first to eight, then to nine categoreal obligations. See PR 222, editors' note.

I think that what Whitehead wanted to write was "The actual entity is divisible, but in actuality is indivisible." This would not do, for it is patently self-contradictory. That contradiction can be removed, however, by introducing the distinction between being and becoming: "The actual entity is divisible in its being, but indivisible in its becoming." That he did not write so indicates that he was not yet aware of this distinction, even though it had been made possible by his new theory.

What causes the difficulty is the assertion that the actual entity is divisible. The first two categoreal conditions require perspectival elimination. By the first, the many feelings in early phases must be compatible for integration in the final satisfaction (PR 223). By the second, the datum felt must be the same throughout concrescence (PR 225, 227). Since the past occasion, the initial datum, cannot be felt in its entirety, only some aspect of it, the objective datum, can be felt:

There is a concrescence of the initial data into the objective datum, made possible by the elimination.... The objective datum is the perspective of the initial datum. (PR 221)⁵⁰

Perspectival elimination is held to require that actual entity be divisible. Otherwise how can a portion thereof, the objective datum, be extracted from the initial datum?

Perspectival elimination was present long before, at least as early as the analysis of datum, process, satisfaction, decision: "The perspective is provided by the elimination of incompatibilities" (PR 150).⁵¹ The section that introduces subjective form (II.7.4b) argues that "the Category of Objective Unity"⁵² requires that incompatibilities be eliminated. The doctrine is finally restated:

how the actual particular occasions become original elements for a new creation is termed the theory of objectification.

50 Original text. Corrected edition concludes with "data".

51 PR 153 (II.6.4) is possibly earlier: "the objective content is analysable into actual entities under limited perspectives provided by their own natures."

52 This is the category of objective identity, as the corrected edition notes. But Whitehead had not yet named it so.

The objectified particular occasions together have the unity of a datum for the creative concrescence. But in acquiring his measure of connection, their inherent presuppositions of each other eliminate certain elements in their constitutions, and elicit into relevance other elements. Thus objectification is an operation of mutually adjusted abstraction, or elimination, whereby the many occasions of the actual world become one complex datum. This fact of the elimination by reason of synthesis is sometimes termed the perspective of the actual world from the standpoint of that concrescence. (PR 210, II.10.1C)

This is his most detailed account of objectification, explaining how the many occasions become one datum for concrescence. The language of causation is avoided, but the theory of physical prehensions is not yet invoked. Whatever activity is needed still lies outside the concrescence.

We have seen when physical prehension is devised, it requires perspectival elimination, which for Whitehead means the divisibility of the actual entity somehow. Why is this not yet a problem for him in the earlier theory of objectification? It also required perspectival elimination.

First, we should note the incompleteness of this account. It is more a specification of what would be required in order to come up with an unified datum than a detailed explanation of the steps required.

Secondly, perspectival elimination for objectification involves the entire many becoming one datum, rather than each physical prehension individually. Past occasions are not considered individually as candidates for division.

Thirdly, the locus of atomicity had probably shifted from the actual occasion to the original datum. The absolute atomicity of the physical occasion had earlier (in RM) led to an adjunct mental occasion which could analyze this atomic synthesis. The theory of objectification coupled with concrescence (i.e. the mental occasion) meant that the physical occasion, reconceived as transition, could no longer be regarded as atomic. Whitehead in his perplexity refrains from designating what is now to be regarded as atomic, but I suspect that the original datum was his candidate, at least at the beginning of the Gifford lectures. There are three main candidates: transition (objectification), the

original datum, and concrescence. Concrescence later turns out to be what is atomic, but at this stage it would be regarded as a mental analysis of the atomic datum.

Still, why wasn't the analysis of this original datum regarded as its division? The original datum is pluralized by the many conformal feelings in the first stages of concrescence. Conformal feelings differ from physical feeling in that they prehend eternal objects derived from the datum rather than the actuality itself.⁵³ They analyze the datum rather than dividing it.

Fourthly, it is unlikely that Whitehead could have resolved the difficulty had he been aware of it earlier. The solution requires the distinction between being and becoming: the atomicity of becoming produces the divisible being. Yet the implicit ontology of the early theory is that becoming is dependent upon an underlying being. It is very difficult to see how the underlying being could be divisible yet be expressed in terms of an indivisible becoming. Or if the being is indivisible, its becoming could be divisible only by rendering it accidental. Concrescence is anything but accidental, even on the earlier theory.

We return to the passage which provoked this digression, to note its context:

The analysis of an actual entity is only intellectual, or, to speak with a wider scope, only objective. Each actual entity is a cell with atomic unity. But in analysis it can only be understood as a process; that is to say, as in passage. The actual entity is divisible; but it in fact undivided. (PR 227)

The locus of atomicity has now shifted to the satisfaction. If the original datum had been an atomic unity, now dissolved in favor of a single process of unification, the unity so achieved in the satisfaction could now be regarded as atomic. That, however, overlooks the fact that the process of actualization could no longer be divided into transition and concrescence, and was a good candidate for the atomicity. If the satisfaction were atomic, it cannot be divided. The difficulty remains.

Whitehead made three attempts to resolve the issue:

⁵³ Later, conformal feelings are identified with physical feelings to harmonize Whitehead's teaching (PR 238).

(2) Atomizing the extensive continuum (PR 67a). The section to which this passage belongs (II.2.2) seems to have originally only considered the continuity of the extensive continuum. It most probably ended before the Zeno-like argument (at PR 68.2). It probably placed its final paragraph (PR 67.33-68.2a)⁵⁴ just before the final paragraph on the previous page (PR 66.37).

The text could have been rearranged in order to accommodate the three paragraphs (spanning PR 66f), with its central claim that: "Actual entities atomize the extensive continuum" (PR 67). The continuum is conceived as purely potential, actualized in terms of actual entities. The insertion refers to "the primary governing data for any actual entity," indicating that this passage is later than the Giffords draft material of this section (II.2.2).⁵⁵ But while we are told that actualities atomize the continuum, we are not told why this is so, nor just what it is about actualities that is atomic.

The next attempt appears to have been originally attached to the end of this section (at 68.2b; or 68.5b). If so, it was displaced by the third attempt, and so was relegated to the discard chapter, "Some Derivative Notions" (I.3.3: at PR 35.30).⁵⁶

(3) Atomicity and continuity (PR 35f). This is the first allusion to Whitehead's Zeno-like argument since the essay on "Time" (1926). Instead of 'supersession', the argument is couched in terms of 'becoming'. Supersession merely replaces one occasion by another. Each occasion is ready made. Perhaps more precisely, no inquiry was then given as to how that occasion comes to be what it is. Perhaps I should say: whatever

54 Except for the transitional initial sentence: "This conclusion can be stated otherwise."

55 PR 67.17-21G is an even later secondary insertion based on the notion of 'subjective aim' as derived from God's primordial nature. Neither notion was even part of the first version of part III, let alone of part II. See "The Growth of Whitehead's Theism," Process Studies Supplements.

56 The first paragraph fits badly with the context of PR 67f. It may have been a free composition to introduce the test of PR 35f, but more likely it came from somewhere else, as yet undetermined.

inquiry was made was not clearly connected to the conceptuality of supersession. These difficulties are partially resolved by replacing 'supersession' with 'that which becomes'.

Previously continuity could only be a "cinematographic illusion". It was occasion itself that embodied "a definite quantum of time" (EWM 308). No distinction was made between the indivisible becoming and the divisible being of an occasion, so the series itself exhibited discontinuous quanta. Now, however, Whitehead distinguished the becoming from what had become:

There is a becoming of continuity, but no continuity of becoming. The actual occasions are the creatures which become, and they constitute a continuously extensive world. (PR 35)

If there is a plenum, and extensive continuity insures a plenum (otherwise some acts of division would divide nothing, which would be impossible), this plenum is being continually constructed by the actual occasions coming into existence.

There is a difficulty: the continuum could not be infinitely divisible if composed of indivisible quanta. Yet it was now possible to distinguish between the occasions as now coming into being, and the being which they achieve. The coming into being could be atomic, while the being achieved, which helps to constitute the continuum, could be continuously divisible. While Whitehead does not yet make just this distinction explicit, it underlies his thought. He is clear that there is a real continuum that actual entities are party to.

The phrase, "that which becomes," hides an ambiguity. It can mean the becoming itself, or the result of that becoming. This is eventually clarified by introducing the notion of the 'act of becoming' (PR 69).

(4) The final argument (PR 68f)⁵⁷

This is Whitehead's most complete presentation of the Zeno-like argument. Given his diffidence (especially in his later writings) to repeat himself, the very fact of its presence here should alert us to its centrality to his endeavour. The argument itself is not

⁵⁷ The final two paragraphs (PR 69.27-70.4) constitute a later section based on 'subjective aim,' which we shall examine in the next section.

so important. If this one did not work, probably another could. This argument was chosen because it enables him to make his point in the shortest possible compass.

This is not the place to assess its cogency.⁵⁸ What we need to pay attention to is what cannot be divided. In its initial formulation, it was "time", not yet distinguishing whether this meant the spatiotemporal quantum or that by which it came into being (SMW 122-27). The second rendition had 'supersession', which expressed the discontinuity but not the extensiveness of what was atomic (EWM 307f). Now Whitehead focusses on the feature which is properly indivisible: the act of becoming:

The conclusion is that in every act of becoming there is the becoming of something with temporal extension; but that the act itself is not extensive, in the sense that it is divisible into earlier and later acts of becoming which correspond to the extensive divisibility of what has become. (PR 69)

Note that the sense in which an occasion is not divisible is carefully spelled out. An occasion comes into being all at once. It cannot be divided into several subordinate acts of becoming. A mental occasion cannot supersede a physical occasion, if each is conceived as a prehensive unification or (what amounts to the same thing) as an act of becoming. Nor can a transitional prehensive unification producing an origivative datum be superseded by a purely mental concrescence. Were either possible, they would divide the indivisible act of actualization.

To be sure, neither transition nor concrescence dependent on transition were sufficient to claim full existence. Transition could only provide the original datum, which could not be fully actual without denying all possibility of freedom and novelty. A purely mental concrescence could not actualize anything without its common datum. Since actualization is based on the smallest available unit of becoming, it could not be either. If the act of becoming is the whole, then its parts could not be acts of becoming, no matter how closely they might verge on it in theory.

If the act of becoming encompasses both transition and concrescence, as in the revised theory, a physical prehension can extend unbrokenly from an emergent

58 See Gottfried Heinemann's critique and my response given in footnote 8 above.

subjectivity to a past occasion. It need no longer be divided into a transitional act of objectification and its conformal feelings. Prehensions directly felt their objects. This is ensured by the indivisibility of actualization.

Just because the occasion cannot be divided in one sense does not mean it cannot be divided in other senses. In fact, the same paragraph contrasts the indivisible act of becoming with "the extensive divisibility of what has become" (PR 69). This refers to what will later be called the morphological or coordinate division of the satisfaction.⁵⁹

If divisibility into smaller acts were the same as divisibility into phases, this would preclude genetic division. There is a fundamental distinction between a concrescent phase, which is always to some degree indeterminate (short of the final satisfaction), and interconrescent sub-acts of becoming, which must become determinate within the process. Whitehead, however, never makes this explicit. At this time he is much more likely to view genetic *analysis* as a hypothetical, abstractive process (PR 233D), which is no kind of division.⁶⁰

Much later, when Whitehead drafted what may well be the final chapter to be written (EWM 238-44), he shifts over to the notion of genetic division, based on the concept that division is the analysis of an actuality into its prehensions:

Genetic division is division of the concrescence; coordinate division is division of the concrete. (PR 283 IV.1.1 M; see also PR 292)

Genetic division divides the act of becoming, but into phases of indeterminateness, not into acts of determination. Genetic phases are needed for the

59 'Morphological' first appears in III.1.12D along with genetic analysis. A genetic analysis is based on the divisibility of the satisfaction. It takes a component feeling from the satisfaction and considers how it came about in the concrescence (PR 235). PR 219f contrasts the two approaches in order to coordinate III.1-5 with IV.1. Here Whitehead seems to studiously avoid ascribing 'analysis' or 'division' to either. This is resolved in terms of 'division' for both in IV.1M (PR 283ff).

60 So, e.g. PR 235 (III.1.10D): "the genetic process can be thereby analysed. If no such analysis of the growth of that subordinate prehension can be given, then there has been a faulty analysis of the satisfaction."

analysis of concrescence, and show how it becomes progressively more determinate. If they were acts of becoming, then the occasion as a whole would be self-contradictorily both determinate and indeterminate.

One way of reconciling the continuity of the extensive continuum with the atomicity of actualities is to consider the continuum as purely potential. That does not do justice to the past in my judgment, for the extensive continuum is rendered determinate in the creative advance. The continuum as purely potential must perforce abstract from this determinateness. But whether potential or determinate the continuum is indefinitely divisible.

An act of becoming is "not extensive in any way that corresponds to the extensive divisibility of what has become" (PR 69); its becoming is not in any way like coordinate division, which divides the determinate being achieved. But the genetic divisibility, when it is finally introduced, of the act of becoming points to another sort of extensiveness, one which is much more abstract. I refer to the locus of the spatiotemporal region which the occasion occupies.

The locus abstracts from the creative advance; it is invariant with respect to past, present and future. The act of becoming and the occasion which it becomes occupy the same locus, but at different times relative to the creative advance. The act of becoming fills that locus (and thus is extensive) in its present immediacy, while what has become (and what can be prehended) occupies it ever afterward. The locus is invariant, but its content differs relative to the creative advance. The present act of determination becomes the determinate event.

Rather than being purely potential I take the extensive continuum to be partly potential (future) and partly actual (past). Either way it is continuously divisible. The present does not yet have determinate being, and hence still belongs to potential being. On the other hand, present becoming occupies its own particular niche with respect to extensionality, and will render that region determinate as it becomes.⁶¹ This niche

61 For this reason (among others) I deem concrescence to be a temporal process, in contrast to many others who conceive it as nontemporal: "On Epochal Becoming:

remains objectively potential until then. In its indivisibility the act of becoming is impenetrable and cannot be objectified. The occasions progressively constitute the continuum, but the indivisibility of their becoming does not carry over to the being they produce. Only actual being is prehensible; and only actual being is divisible.

Basically, Whitehead needs atomicity in order to distinguish actuality from potentiality. Because the event is part of the extensive continuum, it cannot by itself be actual; but only as the outcome of an act of becoming. Actuality means concrete determinateness, but also the activity of the prior act of becoming. The distinction between the act of becoming and the event which it becomes thus enables him to recover the double sense of actuality more satisfactorily. Supersession was not enough. Although it offered a discontinuous process different from continuous events, supersession was not necessarily extensive. The atomic needs to be extensive, not in the sense of being divisible into smaller actualities, but in being analyzable into temporal aspects or phases. The act of becoming is both atomic and genetically divisible. (The intelligibility of the concrescence depends upon genetic divisibility.)

Although this passage (PR 68f) is central to Whitehead's endeavour in many ways, it is not necessarily a creative advance over its predecessor. It simply develops the claim he had made there: "it is easy, by employing Zeno's method, to prove that there can be no continuity of becoming" (PR 35). Because that was his sole concern, two other issues were neglected.

One is the comparison between atomicity and continuity. I have developed that theme beyond the text (of PR 68f). The other is the comparison of what is atomic with the earlier analysis in terms of supersession (EWM 307f). In the earlier accounts, time is atomic, here it is becoming. Time is usually understood as physical, objective time. It is the time of being. Whitehead finally realizes that this sort of time is divisible, such that atomicity must be located in becoming. This is the time of becoming, which is subjective.

The two kinds of atomicity are quite distinct, yet that difference is never remarked on. Whitehead is usually quite reluctant to comment on shifts in his own position.

11. The Indivisibility of Subjective Aim

The last two paragraphs of the section (PR 69f) are evidently a later insertion using 'subjective aim'(G). This concept is absent from the first version of part III, and first arises in a series of insertions preparatory to the final chapter introducing the consequent nature of God.⁶² Evidently Whitehead settled for general principles in analyzing concrescence, but later recognized the particularizing value of subjective aim, which might be conceived as the emergent essence of an actuality.

This passage concerns the indivisibility of subjective aim (PR 69). The division of the satisfaction yields a multiplicity of prehensions with their subjective forms. Those subjective forms are dependent upon the valuation of the subjective aim. But this subjective aim, being the formal unity of the satisfaction, is not among the feelings into which it is analyzed. Yet without the aim the subjective forms cannot be what they are.

This insertion does not challenge or revise the interpretation of the atomicity of the act of becoming, but complements it with another way in which that act is atomic.

Edwards Pols interprets this to mean that the subjective aim is not genetically divisible. If so, it cannot be modified, despite one text that can be read otherwise:

This basic conceptual feeling suffers simplification in the successive phases of the concrescence. It starts with conditioned alternatives, and by successive decisions is reduced to coherence. (PR 224)

If it cannot be altered, then the initial subjective aim received from God must be actualized as the form of the satisfaction. Despite all appearances, Pols maintains that Whitehead's theory amounts to divine determinism, with no freedom or self-creation.⁶³

62 See "The Growth of Whitehead's Theism," *Process Studies Supplements*, volume one.

63 Edward Pols, *Whitehead's Metaphysics: A Critical Examination of Process and Reality* (Carbondale: Southern Illinois University Press, 1967). See my critical review: "Can

Yet Whitehead's argument concerns the *coordinate* division of the satisfaction. He does not argue that the subjective aim can be coordinately divided as that "the subjective aim does not share in this divisibility" (PR 69). It cannot be part of the many feelings of the satisfaction because it is the form of its unity.

The insertion begins: "the creature is extensive, but ... its act of becoming is not extensive" (PR 69). Not only the act, but the subjective aim is not extensive. Were it extensive, it would be coordinately divisible.

If it does mean coordinate division, why does Pols interpret it in terms of genetic division? The text makes no mention of either kind, simply talking about "division" per se. I submit that at this time Whitehead regarded 'coordinate division' as the only form of divisibility; it applied to the 'creature', i.e., the outcome of the self-creative act of concrescence. Since only the 'creature' could be divided, only it was extensive.

It was only later, with the chapter on "Coordinate Division" (IV.1M) that genetic division was introduced (PR 283). 'Division' is now understood as a kind of analysis, an analysis which divides the occasion according to its prehensions. Then it can be divided according to its spatiotemporal extensiveness, or according to the growth of its phases.

While the act of becoming and the subjective aim may seem to be disparate candidates for indivisibility, perhaps they have a common root in subjectivity. While there are many prehensions according to their data, there is only one subject, and it cannot be divided into smaller subjects.

12. Afterthoughts

Whitehead did not set out to establish the atomicity of becoming. He came to the problem by way of mathematical concerns, which is reflected in the way he seeks to justify the atomicity by Zeno-like arguments. Initially his concern grew out of a suspicion of the adequacy of the idea of instantaneous motion, an idea important for the application

of elementary calculus. From these humble beginnings, atomicity proved to be an important impetus for the distinction between the being of an occasion and its coming into being. This distinction becomes a way of understanding the present unrepeatability of becoming and the past repeatable being of an actual occasion. The realism of physical prehension rests on this. The atomicity of concrescence means that physical prehension can stretch from the final subject directly to the past occasions.

The theory of prehension may be placed within a wider context of relationality. Whitehead was early committed to the claim that every actuality is constituted out of its (internal) relations to all other actualities:

The aspects [prehended] are aspects of other events as mutually modifying, each the others. In the pattern of aspects they stand in their pattern of mutual relatedness. (SMW 151; cf. 65, 72f)

A simply located bit of matter is independent of its relations to anything else. He chose the opposite course to scientific materialism. This was facilitated by his early notion of prehension, which required only a single characteristic in common with any other event to establish a prehensive connection. Later this presupposition recedes into the background, but it never appears to be abandoned (cf PR 226f).

If we abstract from the creative advance, complete internal relationality yields a static form of absolute idealism, in which everything is determined by everything else. There is an aspect of this in *Science and the Modern World* if we attend to one of its aspects contrary to Whitehead's own intentions. The theory of prehension and the creative advance are not yet as well integrated as they will become. Future occasions, however, do not yet exist. The theory of physical prehensions means that occasions are internally related to their past, but externally related to their future.⁶⁴

⁶⁴ Charles Hartshorne has pointed out the great significance of such asymmetrical relations in *The Divine Relativity* (New Haven: Yale University Press, 1948). See also his essay on "Whitehead's Revolutionary Concept of Prehension," *International Philosophical Quarterly* 19/3 (1979), 253-63. Yet Whitehead's initial concept of prehension was mutually internal, for the common form must be inherent to each member of the (SMW) prehension. As far as actualities are concerned, at least, the asymmetrical relation in Whitehead did not make its debut until the revised theory of concrescence (part IIID).

Internal relatedness means that an occasion is affected by past actualities, but its determinateness means that it is what it is regardless of what happens next. Occasions become, but do not change. Becoming is dynamic, temporal relatedness. The internal relatedness does not come ready made, as in static absolute idealism. Becoming requires a subject, which in its most primitive form means the capacity to be affected by others. (Mentality is the capacity to be affected by possibilities.)

Each occasion achieves its own individuality by the way it integrates the relations it receives.

Let us provisionally distinguish between relational and substantival ontologies. A relational ontology holds that actualities are wholly constituted out of their relations to other actualities and the way in which they integrate these relations.

All other ontologies are substantival, although there is a tremendous difference between those for which actualities have a preponderance of relations and those which do not admit any internal relatedness. Descartes comes readily to mind, defining a substance as that which requires nothing else but itself in order to exist. But if there is some element of an actuality which is neither a relation nor its integration, such as an underlying basis for change, that element would be substance and its form would be essence.

An enduring actuality is substantival to the extent that its essence is invariant, and hence independent of the relations which it receives or undergoes. A comparable relational event, however, if it is to absorb and unify those relations, must have an emergent essence which only becomes definite in the resultant being. This form only emerges as the form of the being, being in process of formation during its becoming. This emergent essence is what Whitehead calls its subjective aim, conceiving of it primarily in terms of what it aims to become.

Substance is a great help in accounting for endurance and change. The integration of relations seems momentary. Endurance and change can be objectively described as the similarity and difference between successive occasions (PR 73, 80). The successive integration of momentary prehensions, however, seems to require substance, something other than the relations themselves.

This line of reasoning, however, assumes that occasions are generally quite brief, whereas they could be of any duration whatever. Suppose the initial aim proposed that the

occasion not only integrate the momentary configuration confronting it but a range of further configurations. Such a concrescence is as much an integration of received prehensions as any other.

The atomicity of the act of integration need not be momentary. All that is required is that the unification producing being is not broken. That which is to be unified can be great or small. External considerations, however, dictate that the occasion be very small. This is also true of Democritus' atomism. The atoms have many of the same attributes as Parmenides' Being. But they had to be small to be individually imperceptible yet capable of explaining the perceptible. In Whitehead's case there had to be a lowest level of very brief occasions in order to explain change and motion.

One reason occasions are considered momentary is that they sharply distinguish between the present and past. Both substance and cause blur the lines between these temporal modes. Substance, in permitting actuality to persist without change or relations, allows the present to be like the being of the past. Efficient cause, in permitting being to be active beyond itself, allows the past to be like the present. An event, if it is either to be present becoming or past being, cannot be either substance or cause in any straightforward sense.

The real problem, however, is that the atomicity of concrescence does not permit an occasion to influence others while still in concrescence. It does not yet exist as a being to affect anything. As long as the only form of influence between occasions is prehension of determinate being, larger occasions cannot affect smaller occasions included within it. Larger occasions may exist, but they are epiphenomenal.

This explains both the possibility and the problematic nature of the consequent nature of God. Strange as it seems to our ears, the everlasting divine concrescence is atomic.⁶⁵ It is one indivisible unification of all prehensions of the world. It is the one act

65 Because the everlasting divine concrescence is indivisible, my earlier solution as to how God affects the world is defective. Then I had conceived of the divine concrescence as housing a vast multiplicity of quasi-concrescences, one for each standpoint. When those standpoints are future, only part of its actual world has been prehended. Yet

of unification which verges on but never reaches determinate being. If so, how can it ever affect the world? Within the context of prehension as the only mode of influence, Hartshorne has reconceived the one act as a series of momentary atomic acts of integration, each having the being to affect the world. It is only the problem of causal influence, however, that requires these brief divine occasions. Large or small, divine concrescence is atomic.

On the other hand, while all becoming is atomic, all being is continuous. This means that all we experience is really continuous. It is not an apparent continuity constituted out of atomic beings. It may be contingently atomic in some areas, but there is a necessary underlying continuity.

There is one exception which is very important. All that we objectively experience is continuous. Yet the subjective aspect of experience is usually identified with becoming, and that is atomic. It may be that our experience, while constituted out of a succession of momentary atomic acts, appears to be continuous, but this is unsatisfactory to many.

It is possible, however, that subjectivity may mean present immediacy, and not necessarily becoming. If there were a way by which this present immediacy could be transmitted from epochal occasion to epochal occasion which is not based on prehension

God's appetite for a particular standpoint grows in specificity and richness as he prehends more and more of the actual occasions which belong to its actual world, culminating and terminating in the prehensive unification of its entire actual world, thereby exhausting his immanent creativity relative to that standpoint. ("The Non-Temporality of Whitehead's God," *International Philosophical Quarterly* 13/3 (September, 1973), 347-76, at 350f.)

Anything short of a prehensive unification will not provide the determinateness necessary for God to be physically prehensible at that standpoint. On the other hand, each prehensive unification constitutes its own act of becoming, thus dividing the one divine act into many smaller acts.

William A. Christian's somewhat similar solution probably runs into the same problem: *An Interpretation of Whitehead's Metaphysics* (New Haven: Yale University Press, 1959), pp. 395f.

(and hence past determinateness), there could be a persistence of presentness. Then there could be an continuous subjectivity which is ever present, participating in its epochal occasion as it arises. Obviously, this proposal requires quite considerable elaboration.

REFERENCES

- CN Alfred North Whitehead, *The Concept of Nature*. Cambridge: Cambridge University Press, 1920.
- EWM Lewis S. Ford, *The Emergence of Whitehead's Metaphysics* (Albany: State University of New York Press, 1984).
- EWP *Explorations in Whitehead's Philosophy*, ed. Lewis S. Ford and George L. Kline (Fordham University Press, 1983).
- IS A. H. Johnson, ed. *The Interpretation of Science* (Indianapolis: Bobbs- Merrill, 1961).
- PNK Whitehead, *An Enquiry Concerning the Principles of Natural Knowledge*. Cambridge: Cambridge University Press, 1919.
- PR Whitehead, *Process and Reality* (1929) Corrected Edition, edited by David Ray Griffin and Donald W. Sherburne. New York: The Free Press, 1978.
- RM Whitehead, *Religion in the Making* (1926). New York: Fordham University Press, 1996.
- SMW Whitehead, *Science and the Modern World* (1925). New York: The Free Press, 1967.
- Sym Whitehead, *Symbolism; its Meaning and Effect*. New York: Macmillan, 1927.