SCIENCE AND TEMPORAL EXPERIENCE: A CRITICAL
DEFENSE OF C. D. BROAD'S THEORY OF TEMPORAL COGNITION

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Abstract:

Temporal consciousness is philosophically problematic because it appears to have features that cannot be analyzed in a way compatible with the fundamental view of time as a one-dimensional order of events. For example, it seems to be a manifest fact of experience that within a strictly present state of consciousness one can be immediately aware of a succession of events, yet the standard view of time denies that successive events can co-exist, so how can they be given together in a present perceptual state? Such puzzles have occasionally led philosophers to reject scientific or mathematical theories of time. Some time ago C. D. Broad developed a largely unappreciated theory of temporal cognition to cope with these puzzles. In this paper the evolution of Broad's theory is traced, and it is defended from the misinterpretations of later critics. Finally, it is suggested that a modification of Broad's theory, which frees it from the trappings of sense-data epistemology, shows it to be compatible with some current naturalistic approaches to experience that also would need to account for temporal experience within the framework of scientific time.
Temporal experience is philosophically problematic because it appears to have features that are difficult to analyze in a way compatible with the fundamental view of time as a one-dimensional order of events. According to this view, no two successive states can, by definition, be co-present. Yet, for example, it seems to be a manifest fact of experience that within a present state of consciousness one can be immediately aware of a duration, or, of a succession of events. But how can one be given episodes involving events which are no longer strictly present? Moreover, apprehended durations and successions often seem to be simultaneous with their strictly present apprehension, and how can this phenomenal datum be reconciled with the theory of time which insists that they cannot be simultaneous?

One sometimes popular reaction to these problems is to argue that, since candid descriptions of immediate experience are true, the underlying (analytical, mathematical, or scientific) view of time must be mistaken. This move typically embraces a theory of time according to which the present is not momentary, rather, it somehow involves durational atoms or pulses of becoming. But besides adding to the mysteries of time, it can be doubted whether this approach does justice to the manifest richness of temporal experience or to the subtlety of the underlying epistemological issues. After all, upon reflection it seems that change, temporal succession, and relations of temporal precedence are perceived, and none of these facts are illuminated simply by saying that the present has some finite extension (as if it would be a sufficient explanation to claim that temporally proximate events could co-exist in such a present). Moreover, it is likely that the atoms of becoming (if there are such) would turn out to be considerably briefer than the temporally complex objects of "atomically present" states of consciousness, so the epistemological problem of accounting for the "present" sensuous givenness of recently past events would remain even for those who would like to adopt such a strategy. More generally, it would seem that any attempt to roll events that are experienced as successive into a "present" ball of becoming must

do violence both to the supposed veracity of immediate experience and to the minimal logic of a one-dimensional ordering: events that are successive can't be simultaneous.²

Nonetheless, in spite of the epistemological-metaphysical puzzles that can be seen to infect temporal experience, philosophers have too often assumed that temporal experiences as given might be used to help decide larger issues concerning the nature of time or mind. For example, since Bergson it has been a recurrent theme in various quarters that, because science cannot consistently account for the way we experience temporal phenomena, the mathematical, scientific view of time (and of the world in that time) is merely an instrumental fiction, or, that the mind must be quite different from natural objects that do happen to inhabit the scientific temporal order.³ Hence, the puzzles of temporal consciousness continue to stand as specific challenges both to scientific realism and to naturalistic theories of mind. This situation is made all the more serious because philosophically facile treatments of "subjective time" have made their way into some recent scientific literature.⁴

Some time ago C. D. Broad developed an ingenious theory of temporal consciousness that might be modified so that it could play an instructive role in future attempts to account for temporal experience within the framework of scientific time. His theory attempted to do justice to much of the epistemic integrity of ordinary temporal perception while also granting ontological primacy to a more rigorous conception of time. Unfortunately, Broad's theory is largely unappreciated today because it developed by stages in writings scattered throughout his career, and, because the significance of these different stages has been seriously misunderstood by his critics. It is the aim of this paper to remedy this situation by tracing the strategic evolution of Broad's theory, by answering his critics, and by offering a more constructive evaluation.

I

Broad's initial (1923) interest in temporal experiences was motivated by the problem of the reality of time and by the problem of determining the proper epistemological relation between the concepts of science and the concepts of ordinary experience. Theories had been


presented in both areas that were embarrassing common sense: idealists such as McTaggart had argued that time is paradoxical and therefore unreal; meanwhile, physicists were postulating a continuum of events having temporal characteristics seemingly alien to those of ordinary experience. Broad focused his attention on the experience of time in the hope that a careful analysis of this experience would lead to definitions of temporal concepts which would be empirically anchored and which would avoid McTaggart's paradoxes. Also, he hoped that the physicists' conception of time could be understood (defined) in terms of this same experiential basis so that one could be assured that the time of physics is significantly related to the time of experience.

Broad's strategy in ST is to try to show that ordinary concepts of time and space are themselves "extraordinarily remote" from the "crude facts of sense-experience, from which they must have been gradually elaborated" (ST, p. 5). For, if this is so, then "the hold of tradition is loosened; and we are prepared to consider alternative, and possibly more satisfactory, conceptual syntheses of sensible facts" (ST, p. 5). Though Broad claims that such concepts are remote from experience, he is, nevertheless, in the empiricist tradition which insists that they must be rooted in the sensible features of experience. Both conceptual and epistemic priority are assigned to judgments about the immediate, sensuous character of experience. Thus, the way to clarify the status of various views about time would be to "try to point out the sensible and perceptible facts which underlie the highly abstract concepts of science, and the cruder, but still highly sophisticated concepts of common sense" (ST, p. 5). And, as an empiricist, Broad more or less takes it for granted that one can immediately read-off the properties of sense experience. So, in ST, Broad's treatment of temporal experience is intended to be primarily a descriptive prelude to a metaphysical discussion concerning the status of time. He later realizes (by the time of his Examination of McTaggart's Philosophy) that temporal consciousness is fraught with its own distinctive problems, and he is forced then to devise what is, in effect, a sophisticated theory of temporal experience. Understanding Broad's later theory will, however, be facilitated by contrasting it with his early account.

Broad's description of temporal phenomena in ST is influenced by then prevailing sense-data theories of perception and by some interpretations of the new relativistic physics. He hopes to contribute to an empiricist foundation for the new physics by showing how concepts of time and space spring from the sensible characteristics of sensa, but these sensa are quite different from Hume's fleeting impressions of sense. A sensum is defined as part of a sensible field, and a sensible field is, according to Broad, "a four-dimensional spatio-temporal whole" (ST, p. 354). So, "in sensing it, we thus sense directly a four-dimensional whole with three spatial dimensions and one temporal" (ST, p. 410). It would seem that Broad's conception of sensa was influenced by the interpretation of relativistic physics which recommends that one view ordinary physical objects as really being parts of four-dimensional spatio-temporal

wholes. This is convenient, for, if sensa come with the crucial spatio-temporal features of the physicists' world built-in, then Broad's attempt to account for scientific concepts of these features is made easier than it would be if he had only fleeting, momentary sensa with which to work.

It is important to appreciate the literalness of Broad's claim that sensa are spatio-temporal wholes, since this position, along with Broad's early view of time, determines what he initially takes to be problematic about consciousness of temporal phenomena. Broad apparently took seriously what is sometimes called the "block universe" interpretation of relativity according to which four-dimensional entities are wholes existing "all at once", in some supra-temporal sense. More precisely, the universe, including sense-histories, is an ever growing block, for, in Broad's early version, future events do not exist until they are added as parts to the four-dimensional whole consisting of earlier events: "When Queen Anne's death became, it came into relations with all that had already become, and to nothing else, because there was nothing else for it to be related to. All these relations it retains henceforth forever" (ST. p. 81).

Now, it is because past and present events are supposedly both parts of an "enduring" whole that Broad believes one can be directly acquainted with them:

...we can be directly acquainted only with something, not a mere non-entity. On our view we cannot stand in the relation of direct acquaintance to future events, for the same reason which prevents us from robbing a Highlander of his breaks. We can stand in this relation to present events (in sense-awareness) and to past events (in genuine memory), because such events are parts of the sum total of existence when the cognition in question takes place. (ST, p. 79.)

In this context, Broad does not view the present, ostensibly direct acquaintance with temporally extended sensa, including their past parts, as problematic. They simply are parts of sense-fields, so one can sense them as directly as one can sense anything else. Indeed, Broad imagines a "hypothetical observer who would sense the whole of his past history at every moment" (ST, p. 352). This would not be too surprising if, "As already explained, nothing that has ever existed really ceases to exist" (ST, p. 347). What is problematic for Broad, at this point in the evolution of his theory, is to account for the awareness of change and to define temporal concepts in terms of what he believes really exists and is verdically sense-given: temporally extended wholes. In ST Broad is eager to claim that strictly momentary (punctal) events are mere abstractions, or idealizations, which ought to be defined away in terms of a special series of sets of temporal durations (Whitehead's method of Extensive Abstraction (ST, p. 350)).
To this end, Broad presents a diagram representing the history of acts of sensing and their relations to sensible fields:

![Diagram](image)

Figure 1.

The parallel horizontal lines represent O's mental acts and O's sensible fields. The intervals $t_1 - t_2 = t_2 - t_3 = \tau$, which, Broad takes to be the duration of O's "specious" present. Any particular act of sensing, $O_n$, has as its objects all the sensa within an interval of length $\tau$. All acts of sensing that are separated by temporal intervals less than $\tau$ can have some sensa as common objects. The closer the acts, the more sensa they will share; the farther apart, the fewer they will share. In ST Broad believes that this sharing of objects allows one to sense change because some temporally extended sense field can be sensed "...throughout a finite process of sensing. Thus the qualitative differences between its earlier and its later sections will be sensed together; i.e. the observer will not merely notice that something has changed" (ST, p. 353). This ability to sense change is the heart of Broad's early account, for he feels that it provides the qualitative basis for saying that one part of a sense-field is earlier than another part, and, hence, it yields the empirical material for defining temporal concepts, (ST, pp. 351-353).

Broad's early theory deserves only two short critical remarks. First, though he uses the term 'specious present' his theory is not a theory of the specious present. This term was originally coined by a psychologist, E. Clay, and used by William James, to contrast the durational contents of experience with what was taken to be the genuine present, namely, a strictly momentary present. In other words, it referred to a duration that was usually thought to be present, but which could

6William James, The Principles of Psychology (New York: Dover Publications, 1950), Chapter IX.
not really be present. Now, by saying that a duration within a "specious present" becomes present as a whole, and by claiming that these durations are given veridically as so becoming, Broad is, in effect, claiming that neither the specious present nor what one is given within the specious present are speciously present: "...on the sensum theory, sensa have all the qualities that they appear to have," and presumably this includes their becoming present as durational wholes (ST, p. 369; cf. p. 69). Second, Broad leaves obscure how, exactly, his series of acts of sensing can add-up to a unified, phenomenologically authentic experience of temporality or change. Merely noting from a philosophical perspective that successive acts share some objects and differ in others does not explain how this similarity and difference is able to be registered in a present, unitary act of sensing, which is what Broad needs to support his thesis that one can sense change. However, Broad does not concern himself with the details of the durational character of acts of sensing; he casually refers to them as processes, probably hoping that there is sufficient dynamism and continuity in the processes to get the job done. In any event, pursuing either of these critical remarks would be academic since Broad's later version of the theory differs in both aspects.

II

Sometime between ST (1923) and his Examination of McTaggart's Philosophy (1938), Broad modified his theory of time, and this led him to revise his account of temporal consciousness. By 1938 Broad no longer believed that events endure; continuants endure, but events are not continuants. Instead, continuants are to be analyzed as successions of qualitatively similar events, and "temporal relations directly relate events or processes; they do not directly relate the continuants of which events and processes constitute the histories". Perhaps this improvement in Broad's position was a result of recognizing that his earlier loose talk about past events still existing gives the impression that he was trying to say that such events are both present and past, thereby contradicting himself. In any event, Broad was forced to take seriously the temporal nature of the relation between the earlier and later parts of any duration. He could no longer say, for example, that because the earlier part still endures a temporally extended act of sensing can be present as a whole. This realization will compel Broad to analyze temporal experience in terms of the features of strictly present events instead of temporally extended wholes.

Of equal significance is Broad's abandonment of his prior claim that strictly momentary events are merely fictitious idealizations. In EM Broad says that the determinateness of any temporal position presupposes instantaneous events:

...neither presentness, in the strict sense, nor any absolutely
determinate degree of pastness or futurity, can characterize
a temporally extended term. Such a term cannot be present
as a whole. If it is past as a whole, any earlier phase of
it will have a greater degree of pastness than any later
phase; and if it is future as a whole, any earlier phase of
it will have a less degree of futurity than any later phase.
Thus the notions of strict presentness and of perfectly
determinate degrees of pastness or futurity are inseparably
bound up with the notion of strictly instantaneous terms,
i.e., terms which have temporal position but not duration,
and are analogous to geometrical points or unextended particles.
I propose to call such terms 'event-particles'. (EM, p. 273.)

Broad is not, of course, suggesting that there are no events which have
duration. There are such events, but these events are to be construed
as series of event-particles, each of which has absolutely determinate
temporal position. Broad does not say whether he had any other reason
for embracing event-particles. Perhaps, he also became disenchanted
with Whitehead's method of Extensive Abstraction. In support of this
possibility, it is interesting to note that Broad now thinks that con­
ceptions of the instantaneous can be rooted directly in terms of the
given: "I think that some event-particles are boundaries of events.
And I think that we are able to form the conception of event-particles
because we often prehend events as having boundaries" (EM, p. 273).

In ST Broad had treated temporal consciousness as a comparatively
unproblematic phenomenon, as something which might be used to deal with
other philosophical problems. Now, after adopting a more rigorous view
of time, he discovers that temporal consciousness involves its own
special difficulties. First, he observes that the following propositions
are "commonly taken to be self-evident":

(1) Neither persistence without qualitative change nor quali­
tative change can be ascribed to a subject which is literally
instantaneous. Both involve duration.
(2) Anything which a person prehends at any moment must be
present. (EM, p. 282.)

Broad then recognizes that if only the instantaneous can be present (the
position to which he is now committed) "difficulties at once arise":

If anything which a person prehends at any moment must be
present, it must be instantaneous. If it is instantaneous,
it can neither persist without qualitative change nor
suffer qualitative change. Yet prehended objects are
prehended as persisting unchanged or as changing. Again,
it seems evident from direct inspection that the objects
which we prehend at any moment are not instantaneous
event-particles. (EM, p. 282.)

Broad proceeds to scorn psychological and philosophical theories which
assert that "what is prehended at any moment must have 'presentness',

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in some sense which does not entail instantaneousness and exclude
duration, as presentness in the proper sense does" (EM, p. 282). In­
deed, "The doctrine of the Specious Present seems to be a verbal trick
for evading these difficulties" (EM, p. 282). To the extent that his
own earlier theory required sensings to be present in a non-instan­
taneous fashion, Broad would have to admit that his account of
temporal experience in ST involved precisely this verbal trickery.

Now, pending a solution of the puzzles of temporal experience which
preserves the epistemic prowess of direct acquaintance, much of Broad's
larger epistemology is in jeopardy. For, if the temporal appearing of
sensa is incompatible with the nature of time, then the suspicion might
arise that sensa are incapable of serving as a foundation for scientific
concepts. Or, it might be suggested by a friend of McTaggart that time
itself is not real. Neither alternative could have appealed to Broad.
Since he realized that temporal consciousness becomes problematic
primarily as a result of the requirement that present events be momen­
tary, Broad's central problem became: how can one maintain that sensa
are veridically given as changing and as temporally extended if each act
of sensing must be an instantaneous event, i.e., how is temporal experi­
ence veridically achieved in the momentary present?

As part of his overall effort to save temporal appearances, Broad
proceeds to reject one of the propositions which he said is "commonly
taken to be self-evident":

...I propose to reject the proposition that anything which a
person prehends at any moment must then be present. For it
entails directly the false proposition that we prehend event-
particles and nothing else... I shall assume that what a
person prehends at any moment is of finite duration, and
therefore that only a single instantaneous cross-section of
this total object can be present at that moment. (EM, pp.
282-283.)

Two preliminary comments are in order. First, the entailment Broad
mentions is not as direct as he indicates, because it presupposes his
newly adopted theory that the determinateness of temporal relations
requires a punctal present. Second, as Broad uses the term 'prehend'
in EM it has the same function which 'intuit' or 'sense' had in his
earlier writings. McTaggart had used the term 'perception' to cover
every instance of acquaintance with particulars, but Broad wants to
have a convenient way to distinguish perception, where this involves
the successful cognition of material objects, e.g., from the purely
intuitive and immediate "perception" of such entities as images and
sensa. So, Broad proposes to "substitute the artificial term Pre­
hension for 'perception' when used in McTaggart's extended sense
[i.e., the sense in which it applies to cases of intuition]" (EM, p. 4).

Broad's abandonment of the proposition that anything which a person
prehends at any moment must be present is a strategic sacrifice. It
will be shown that he is giving up one manifest feature of experience
so that he can try to hold onto others, namely, the ability to prehend change and duration. This maneuver represents a willingness to reject ordinary beliefs about what is given in favor of a philosophically motivated interpretation of the given. But as the theory becomes more complex, additional features call for explanation.

In The Mind and Its Place in Nature Broad had proclaimed that "It is the essence of a perceptual situation that it claims to reveal an object as it is at the time when the situation is going on." Broad analyzes various cognitive achievements in terms of the obtaining of different kinds of metaphysical complexes—his so-called cognitive "situations," which consist of objective and subjective constituents standing in some particular cognitive relation. These situations can be more or less complex depending upon whether reference is made beyond the objective constituent to some "epistemological object," and depending upon whether or not there is an ontological object corresponding to the epistemological object (see MPN, Chapter IV). For example, if one (the subjective constituent) looks towards the sky at night he may prehend a light sensum (the objective constituent) which, in perceptual judgment, is referred to a star (the epistemological object), and the perceptual judgment may or may not be true depending upon whether or not an ontological object (a real star) exists corresponding to the epistemological object. Now, the reason it is the "essence" of a perceptual situation to claim to reveal an object as it is at the time when the situation is going on is that one ordinarily (pre-philosophically) takes the objective constituent (the sensum) to be, or to be a part of, the epistemological object, and the objective constituent must literally be a part of the perceptual situation "at the time when the situation is going on." In contrast, "it is the essence of a memory-situation that it claims to reveal an object as it was some time before the memory-situation began" (MPN, p. 145), because, though the objective constituent (e.g., a memory image) is a part of the memory-situation, it is not taken to be, or to be a part of, the past epistemological object.

Broad's earlier position that the present has some finite extension and that past events endure lent apparent plausibility to his prior assertion that past parts of temporally extended sensa can be constituents of present perceptual situations. Curiously, in spite of his changed view of time, he continues in EM to maintain that some past events (some immediately past sensum-events) can be objective constituents of perceptual situations, i.e., that one can intuitively prehend recently past events. Though this may appear to be the most direct way to try to explain the experience of durational phenomena, it will be shown later that this feature of Broad's theory generates more problems than it solves. But supposing temporarily that one can stand in direct, sensuously cognitive relations to past sensa, how is one able to prehend these sensa as temporally extended or as changing? Recall that in Broad's earlier theory the difference between the earlier and later portions of a sense-field can be discerned by sensing sensa change within

the field: the earlier portions are simply those sensed before such irreducible qualitative change. This solution is no longer available to Broad if acts ofprehension are momentary. Even if the prehended sensa stretch some distance into the past, there is no time within any present momentary act to sense change within the field. There may be differences within the field so that, in terms of Broad's earlier distinction, one might be able to notice that change has occurred, but one would not be able to prehend the sensa changing.

In his new theory Broad seems, in response to this predicament, to back away from his earlier claim that one can actually sense change. He introduces a new property, which he calls "presentedness", whose function is to serve as a temporal-position indicating cue. Presentedness is said to be a "psychological characteristic, which is capable of various degrees from zero up to a maximum" (EM, p. 282). That instantaneous cross-section of a sense-field which is present, and simultaneous with the act ofprehension, has the maximum degree of presentedness, while "...the degree of presentedness possessed by cross-sections which are earlier than this one tails off to zero at the cross-section which forms the boundary between what P is just ceasing to sense and just beginning to retrospect" (EM, p. 283).

Figure 2.

In the diagram, each triangle, such as $A_1B_1C_1$, represents a specious-present situation, $B_1$ being the time of the act of prehension and $A_1B_1$ representing the time-interval prehended in the act (it is the
interval that Broad can now consistently call the specious present). The height of a perpendicular on $A_1B_1$ to line $A_1C_1$, for example, $A_2 a_21$, represents the degree of presentedness of the event that occurred at $A_2$ asprehended at time $B_1$ (EM, p. 285).

According to the new theory, an event can be the objective constituent of several successive prehensions, and in each later specious-present situation it will be prehended with a lesser degree of presentedness than in earlier ones. This "steadily diminishing average degree of presentedness with which the phase is prehended is the sign and measure of its steady retreat into the more and more remote past" (EM, p. 288). Notice that Broad no longer says that one directly senses change itself; instead, one prehends degrees of presentedness, and these are taken as the sign and measure of change. Whereas Broad seemed, in ST, to take for granted the ability to be directly acquainted with the temporality of sensa, the situation is now much more complex, with presentedness playing a leading role:

I take it that our prehension of the contents of each Specious Present as having presentedness is the experiential basis of our notion of presentness in the strict sense. Presumably the tailing-off in degree of presentedness to zero from the latest to the earliest boundary of the content of each Specious Present is one factor in the experiential basis of our notion of temporal transition. A second factor is the continuous series of over-lapping Specious Presents. And a third factor is the way in which a phase, short enough to be prehended as a temporal whole throughout a series of successive Specious Presents, steadily diminishes in degree of average presentedness... (EM, p. 288.)

It will facilitate critical discussion to list now the manifest features of experience which Broad wants to explain and to outline his specific account of each.

(1) **Experience can have some duration** (EM, p. 266). For Broad, all durational phenomena are to be analyzed as series of successive phases of a process, each of the phases (event-particles) having no duration. This analysis is also supposed to apply to the process of experience, where, the event-particles are momentary prehensions.

(2) **Any two experiences of the same person stand to each other in a determinate form of a determinable temporal relation** (EM, p. 266). The fact that experiences have duration (i.e., that they are sets of event-particles) means that the determinate temporal relations they have to one another are more complicated than the temporal relations between event-particles. For example, since experiences might overlap one could not, then, simply say either that they are simultaneous or that one is earlier than the other. But these more complicated relations can, in the end, be understood in terms of strict presentness and the temporal relations of event particles. Thus, to say that one experience overlaps another would be equivalent to saying that the
later boundary (an event particle) of one experience is simultaneous with some phase of the other experience, but the earlier boundary is not simultaneous with any phase of the other experience (EM, p. 276).

(3) Experience is, for the most part, temporally continuous (EM p. 285). Broad does not explore in detail the apparent continuity of experience. In ST he tended to treat continuity as a brute fact of nature, as an aspect of the durational wholes that become present, but since he now believes that only event-particles can strictly be present, he tries to understand the continuity of experience in terms of the compactness of the series of successive momentary acts of prehension:

Since there is continuity in our experience in respect of degree of presentedness, there can be no question of any Specious Present having an immediate successor, as, e.g., the integer 2 has for its immediate successor the integer 3. The series of successive Specious Presents must be compact, like the series of rational fractions; i.e., between any two Specious Presents... there will always be an intermediate one... We must therefore remember that, between any two Specious Presents represented in the diagram, there will always be an infinite number of others not represented. (EM, p. 285.)

It should be noted that the compactness of specious-present situations (and, hence, of prehendings) is inferred by Broad as an explanation of the fact that one can prehend sensa without having gaps in one's experience and without there being any "repeated sudden jumps from maximal to minimal degree of presentedness..." (EM, p. 284). Broad never says that he has actually been directly acquainted with either an infinity of phases of sensa or with an infinity of acts of prehending.

(4) Objects can be experienced as having duration, or as persisting (EM, p. 281). The fact that one can perceive temporally extended phenomena as having duration is to be accounted for by one's ability to prehend what is immediately past. In the punctal present, one stands in a direct, sensuously cognitive relation (prehension) to recently past sensa: "...the prehended phase is completely past at the moment when it first begins to be prehended, and it is getting more and more remotely past throughout the period during which it continues to be prehended as a temporal whole" (EM, p. 288). Sensa can be directly experienced for a period up to the length of the specious present, and sensa having a duration up to the length of the specious present can be directly experienced as having that duration. The earlier parts of durational phenomena can be recognized as such by their having lesser degrees of presentedness than later parts.

(5) Finally, objects can be experienced as changing, when (i) they are prehended in a succession of specious present situations such that (ii) their earlier, qualitatively different phases are prehended as having diminishing degrees of presentedness in later acts of prehending (EM, pp. 281 ff.)
Now, if (1)-(5) are adequately dealt with in this fashion, then Broad will feel vindicated in adopting what "many people would regard ... as highly paradoxical" — the claim that what is presented in prehension is largely past (EM, p. 287). Broad believes that in providing a coherent account of (1)-(5) he has also shown that most of the temporal features of experience are not delusive. McTaggart had tried to lessen the incredulity of his thesis that time is not real by pointing out that even if time is real our experience of temporal characteristics is, in any event, largely mistaken. Armed with his theory, Broad replies that

...there is, no doubt a certain amount of error in all prehension of objects as temporal. But surely it is absurd to suggest that it is comparable to the error which there would be if nothing were really temporal at all. For (a) it is concerned only with one temporal characteristic, viz., presentness. Nothing that has been said about the Specious Present prevents us from trusting our prehensions when they tell us that there is change and persistence, that some events overlap in time and others are separated, and so on. (b) Even about presentness the error is very limited in extent. (EM, p. 322.)

Basically, then, Broad's later account is true to the spirit of his earlier one: the fundamental goal is to show that experience is consistent with the nature of time, especially as conceived by science, and this is to be accomplished by an empiricism which builds upon the reliability of what is immediately given within experience. Broad's new view of time has, however, resulted in several important modifications. A new property, presentedness, has come to play a crucial role in the experience of duration and succession; experience itself is said to consist of a series of momentary events; and, the belief that what is experienced must be present is rejected. Each of these modifications is a significant theoretical step beyond the ordinary, manifest features of temporal consciousness. The concept of presentness is a technical innovation, difficult to interpret in experiential terms (Broad probably intended it to be analogous to the fading of an after-image), and the suggestion that experience consists of a compact series of instantaneous events is not one that can be straightforwardly verified by inspecting sensa. So, if someone does not hold Broad's view of time, or, if one wants to try to save temporal appearances in a way that will leave them in a more recognizable form, then it is not likely that he will be happy with Broad's theory.  

Later in his career (in "A Logistic Analysis of The Two-Fold Theory of the Specious Present," British Journal for the Philosophy of Science, Vol. II, No. 6 (1951)) Broad flirted with the suggestion that some of the phenomena of temporal consciousness could be dealt with by postulating a second temporal dimension. But this theory is not developed, and it can be argued that it merely postpones basic epistemological puzzles to another dimension.
An example of this kind of criticism is offered by J. D. Mabbott in his article, "Our Direct Experience of Time." Mabbott complains that according to Broad's theory ordinary beliefs about temporal experience are mistaken, and he takes this to be grounds for rejecting Broad's theory along with any account which says that the experienced present is specious. In short, Mabbott argues that since time and experience are as they manifestly appear, Broad's theory must, then, be false.

Mabbott takes Broad to hold that "the definition of the specious present requires the conception of a momentary act of awareness" (DE, p. 310), and he claims that it is from this position that most of Broad's mistakes stem. It should be remembered, though, that the situation is more complex than Mabbott realizes. Broad did not believe that it is the definition of the specious present, per se, which requires momentary acts. Rather, it was his ultimate conception of time that led him to assert that whatever is strictly present must be momentary. Indeed, in ST Broad had thought that momentary events were convenient, but dispensable, idealizations, and this point should have been obvious to Mabbott since he focuses his attention on Broad's theory as it was formulated in ST. Unfortunately, Mabbott seems generally unaware of the changes in Broad's theory of time and of the corresponding evolution of his account of temporal experience; he juxtaposes quotations from ST and EM and treats them as coeval components of the same theory. The result is a misrepresentation of Broad's theory. Nevertheless, Mabbott's criticisms are worth examining since they typify a challenge to which Broad would be sensitive — that his theory flies completely in the face of experience.

Mabbott begins by asserting that "there cannot be momentary acts of awareness just as there cannot be momentary sense-data" (DE, p. 310). But he does not present an explicit argument against momentary acts, nor does he deal with Broad's argument in support of them, according to which no temporally extended item can be present all at once. The closest Mabbott comes to motivating his claim is to cite the principle that "the only way in which a temporally continuous experience can be broken up into elements is by content — i.e. by qualitative differences between the elements" (DE, pp. 306-307). Now, since he seems to believe that nothing punctal can have qualitative content he is led to feel that "a mathematical instant, having date but no duration, could not exist or be perceived" (DE, p. 305). Without much reflection, Mabbott appears to have extended a model for the spatial inherence of some qualities (according to which, e.g., a spatial patch cannot be colored unless it is extended) to time. But it is far from clear that temporal processes

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10J. D. Mabbott, "Our Direct Experience of Time," *Mind*, (April, 1951); reprinted in R. Gale (ed.), *The Philosophy of Time* (Garden City: Doubleday, 1967). Subsequent references will be to Gale's volume and will be cited in the text by DE.
have qualities in the same way that spatial objects do. In the end, his distrust of momentary acts boils down to the fact that he does not think they can be used in a description of manifest temporal experience:

Broad seems to accept the doctrine ... as giving an accurate description of our direct experience of time. The effect on me is the exact reverse. It drives me to conclude that the doctrine of the specious present is untenable and sheds no light on our normal apprehension of temporal events. (DE, p. 311.)

Mabbott goes on to claim that the way Broad tries to construct experience out of momentary acts is mistaken. Broad says that the series of specious-present situations is compact in the mathematical sense according to which "Between any two specious presents there will always be an infinite number of others" (EM, p. 285). Mabbott responds by saying that he finds "it hard to believe that this is a description of our experience ..." (DE, p. 313). For, "... if Broad's analysis is accepted, we must say that a direct experience of a sound lasting say three seconds will be the awareness of an infinite set of overlapping specious presents" (DE, pp. 312-313). In any temporal interval one can, according to Mabbott, experience only a finite number of objects, and one is never aware of having lived through an infinite number of mental acts.

Moreover, if the objects of successive prehensions can overlap, as Broad says, when such overlapping occurs the same event is the object of several successive acts. Mabbott interprets this situation as implying that one would, then, experience the same event repeatedly:

Every brief sound I hear not once but repeatedly. Nothing in my experience confirms this repetition... To say that our experienced content consists of a compact series of overlapping specious presents results from saying that an act of awareness consists of a compact series of instantaneous acts of awareness. But there are no such acts. (DE, p. 313.)

Instead of analyzing or reconstructing the continuity of experience, Mabbott feels that Broad's "talk of infinite sets and series" falsifies the continuous character of experience. In sum, Broad stands indicted for allegedly violating the following manifest facts. (i) Everything that one is sensibly aware of and all experiences have duration. (ii) Between any two times both the objects of experience and experiences themselves are always finite in number. (iii) When one experiences an event, one does not experience the event recurring repeatedly in successive acts of awareness.

In defense of Broad, it should first be noted that he never claims that one can apprehend the punctal character of mental acts themselves, and, he never says that the objects of experience can be apprehended as being infinite in number. Mabbott's confusion is caused partly by a genuine methodological tension in Broad's theory, one that is generated by the different characters of the explanandum and the explanans: the manifest durational qualities found in experience are different
from those of experience considered as a series of successive, momentary phenomena. This tension can be lessened somewhat by noting that, with respect to our knowledge of the fine grain character of mental processes, Broad is closer to being a concept empiricist than either a judgment empiricist or a phenomenalist. That is, he is concerned with showing that the concepts used in his theory are capable of being defined, more or less ostensively, within experience; he does not always attempt to verify directly his theory simply by examining a succession of sensa or prehensions. Nor does he believe that the objects of knowledge must be reduced to the contents of sense experience, even when experience itself is the object of knowledge. For example, while coming to the conclusion that momentary events are logically required by his view of time, Broad notes that the concept of a momentary event can be made empirically legitimate by observing the momentary boundaries of temporally extended events. Generally, once a concept gets its credentials within experience, Broad feels free to try to apply it to things that are not directly experienced (e.g., to such theoretical entities as electrons). Similarly, Broad tries to empirically ground the concept of a compact series by citing a case where one listens to shorter and more numerous clicks:

We can think of the successive clicks as getting shorter and shorter and more and more numerous... Thus the later boundary of any click approaches nearer and nearer in temporal position to the earlier boundary of the next click. When the noise-process has become continuous we can think of the successive clicks as having approached to the limit of zero duration ... Thus we form the conception of a continuous uniform noise-process as consisting of a compact series of qualitatively similar event-particles, each with a different and absolutely determinate temporal position and without any duration. (EM, p. 276.)

But neither their punctal character nor the compactness of their succession is itself observed. After such concepts have been rooted in experiential terms, the empirical or philosophical cogency of theories which make use of these concepts is presumably determined by their ability to explain the manifest features which are given.

So, contrary to Mabbott, it is likely that Broad does not intend his theory of temporal consciousness to be a mere description of temporal experience. Rather, it is meant to explain why such descriptions succeed to the extent that they do. Though Broad thinks the sensuous aspects of experience can be veridically intuited, he does not feel that common-sense judgments about the given should be taken at face value. Indeed, after exploring some problems facing naively realistic theories of perception, he remarks: "Any theory that can possibly fit the facts is certain to shock common-sense somewhere; and in the face of the facts we can only advise common-sense to follow the example of Judas Iscariot, and 'go out and hang itself'" (MPN, p. 186). Broad would not, then, be too upset if his theory "falsifies experience," to use Mabbott's phrase, so long as what is falsified are unreflective common-sense beliefs about experience.
To be more specific about how Broad might respond, he could begin by saying that sensa can be veridically inspected in that if they are intuited as having some quality then they do have that quality, but there is no reason to suppose that inspective judgments are infallible in the sense of being exhaustive. [For instance, we must not suppose then that, because we inspect a certain spatio-temporally extended whole, we therefore, ipso facto, have inspective knowledge of all or most of its parts. Moreover, a certain whole might have a certain characteristic and there might be a certain set of adjoined parts which make up this whole and do not have this characteristic. (MPN, pp. 300-301; cf. p. 467.)

In this manner, to be temporally extended might be an inspectible property of sensa or of mental processes as wholes, and yet Broad could feel free to say that there are reasons for thinking that such wholes consist of parts which do not have this property and which are not themselves inspectible. And, in EM Broad has basic reasons, pertaining to the nature of time, for saying that all temporally extended entities consist of momentary event-particles. In short, the momentary experiences that really constitute "an experience" need never be given as the content of a prehension or introspection, yet they could still function as legitimate posits in Broad's theory. Not everything need be given or remembered, and this could include experiences.

Broad might go on to argue that, instead of falsifying experience, his theory of temporal consciousness presents a more complete picture of mental processes. One may not be able to intuit momentary prehensions, but this is simply because they are below some psychological threshold; they are just too brief to be discerned individually in later acts (see MPH, p. 451). But they are genuine, and they constitute experience by being parts of a series. This need not mean that when one intuits experiences as having duration one is introspecting altogether delusive appearances. Rather, what one is vertically intuiting as having duration is a whole (a series) which happens to consist of momentary parts. The reason for believing that durational experiences have such punctal parts is not because these parts have been seen but because they play a role in a theory which, Broad hopes, can make intelligible the introspectible features of temporal experience.

In a similar fashion Broad could handle Mabbott's observation that one is not aware of a multitude (let alone an infinity) of mental acts or objects during any particular interval. He could claim the fact that one does not, and could not, intuit the full temporal complexity of experience stems from limits on the ability to introspect individual prehensions as such. No person may be able to introspect or remember the series of his own momentary prehendings as such a series, but this should not prevent one from postulating series as part of an explanation of experience. Again, one can still doubt, though, that a series must be compact to explain the apparent continuity of experience. It might just be that the gaps among a finite number of prehensions are too brief to be registered in consciousness.
Broad could argue that the fact one does not experience mental events in their multitude does not mean that what one does introspect is totally delusive. Mental processes may be given in some momentary acts of introspection as wholes, with properties they have as wholes, but this need not require the givenness of either the momentary parts of the introspected process or the givenness of the momentary character of the present act of introspection.

With respect to Mabbott's last criticism, (iii), Broad's response could be that during a specious-present interval an object is, or can be, experienced repeatedly in a series of successive prehensions. But one need not be aware of this fact in any given experiential situation, for at any given time the prehended object is the object of just one act of prehension, and just once in that act. It might also be remembered as being the object of earlier prehensions, but it need not be: "...the occurrence of an experience in the past is never a sufficient, even if it be a necessary, condition for the occurrence of a memory in the present" (MPN, p. 413). The fact that an event has been repeatedly experienced in many very recent prehensions need not enter any later consciousness. Contrary to Mabbott, there need be no experience of repetition.

IV

C. W. K. Mundle, another of Broad's critics, raises further questions about how theories of the specious present can be "cashed" metaphysically or experientially. But Mundle also misunderstands Broad.

Whereas Mabbott failed to appreciate the theoretical, explanatory role of Broad's momentary prehendings, Mundle mistakenly supposes that Broad dispenses with all momentary events in EM, as he had done in ST. To support this interpretation Mundle first cites Broad's comments in ST to the effect that only durational events are real, then, he claims that in EM Broad actually "drops all talk about 'acts of sensing'" and gives his diagram a new interpretation, according to which the triangles (see Figure 2 above) no longer represent acts of sensing. Instead, they are supposed to represent the degree of presentedness of sensa (HS, p. 33). Neither observation, however, successfully supports Mundle's claim that momentary mental acts were not an integral part of Broad's later theory. As has been shown, Broad came to see that momentary events are required by his view of time, and he no longer felt that they needed to be defined away. Moreover, Mundle's remark that Broad does not use the term 'act of sensing' in EM is true, but irrelevant. For, Broad does refer to momentary acts of prehending; he gave up the term 'act of sensing' merely to avoid terminological confusion in the context of his examination of McTaggart's writings (EM, pp. 407). Mundle's further claim that the apex of the triangle $A_1C_1B_1$ (Figure 2)

merely represents the maximum degree of presentedness is not true. It is the line $B_1C_1$ that represents the maximum degree of presentedness, and Broad gives no indication that the whole specious-present situation represented by $A_1C_1B_1$ does not involve, as a component, a momentary act. On the contrary: "We can say that at any moment an instantaneous act of prehension grasps a total object which is not instantaneous but stretches back for a short period $T$" (EM, p. 321).

Once Mundle mistakenly thinks that Broad is committed to irreducibly durational mental acts, he is led to object that Broad's theory does not allow the precise dating of mental events, and, that it thereby gets "involved in a vicious infinite regress" (HS, p. 32). First, if experience is durational then it is spread out in time, and it becomes impossible to say that it happens at any one time. How, then, Mundle asks, are the phases of experience, which occur at different times, held together to constitute an experience? If each temporally extended object of experience must be synthesized by an act of experience, and if each act of synthesis is itself spread out in time (Mundle takes this to be Broad's position) then it, too, must be synthesized by some other process, and so on. Thus Broad seems caught in an infinite regress: each synthesis requiring another. Mundle's somewhat cryptic conclusion is that "acts of sensing... do not fulfill the purpose for which they were introduced, i.e., to provide empirically respectable substitutes for mind-substances" (HS, p. 32). Apparently, Mundle thinks that the holding together of the phases of experience must be accomplished by an enduring mind-substance, but he does not elaborate.

Mundle's objections are ill-conceived from the start. In EM, contrary to Mundle, Broad believes that momentary acts are metaphysically legitimate. Indeed, Broad's theory of temporal consciousness seems tailored to be an example of how a process can be construed as a series of momentary events. So Broad would reject Mundle's assumption that an act of "synthesis" cannot be achieved instantaneously (Broad, however, does not himself use the term 'synthesis'). If each prehension can somehow reach out and achieve cognitive contact with temporally extended sensa, and this is Broad's claim, then the unity and identity of each prehension does not have to be guaranteed by any kind of metaphysical synthesis external to the series of momentary acts. Other questions might be raised about how earlier momentary prehensions affect later ones, and, whether Broad's account, relying solely as it does upon intuitive prehensions, can do justice to the experience of change, but Broad's theory is not vulnerable to Mundle's charges that it leaves experiences undatable and that it involves a vicious regress.

It should be reemphasized that one of the merits of Broad's mature theory is the extent to which it takes time seriously: since experience is itself subject to time, Broad comes to see that past experiences cannot be literal parts of present consciousness (though they might be the objects of current experience). The present perceptual experience of duration and change cannot consist of an earlier plus a later experience — it cannot be some hybrid complex of experiences which have occurred at different times. Contrary to his earlier theory (and
contrary to the spirit of Bergsonian conceptions of duration), Broad realizes that past experiencings do not constitute a part of present reality. Thus, if one perceives durational phenomena, the perception must be achieved, at any given time, by a consciousness which is completely present. Criticisms like Mabbott's and Mundle's fail because they do not come to terms with Broad's argument that some common beliefs about temporal experience must, then, be mistaken. Accepting this consequence, Broad feels forced to take a closer look at strictly present experience and to try to find in it the marks which could be responsible for the temporal differentiation of perceived phenomena.

V

Though Broad's account becomes theoretical in the sense that he feels free to postulate mental processes whose fine-grain details are not introspectible, nevertheless, he is always guided by what he takes to be the given features of experience. Some mode of intuition reveals the phenomena to be explained, and some mode of direct acquaintance is supposed to reveal the qualities in terms of which the explanatory theory is to be constructed. So, some momentary events and some degrees of presentedness of sensa are supposed to be given, even though the full complexity of the series acts of prehension may not be. Now, contrary to the critical strategies of Mabbott and Mundle, any defects in Broad's theory are probably traceable to his trying to give too much weight to phenomenal data, and, to his trying to make his theory look as if it were largely a product of inspection. This point is important because it is likely that the processes that constitute temporal consciousness are too complex to be understood in terms of the apprehended qualities of experience, yet Broad's theory might help explain these processes once the elements of his theory are freed from the straight-jacket of phenomenal datumhood.

Consider Broad's explanation of the perception of temporally extended processes in terms of the direct prehension of the past parts of these processes (see (4) above). Broad bends over backward to find sense-data support for this explanation, even though his motivation for the explanation is largely theoretical. Recall that he rejects "the proposition that anything which a person prehends must be present ... [for, given the theory of time, it entails] the false proposition that we prehend event-particles and nothing else" (EM, p. 282). So event B₂ (Figure 2) is the only event that is strictly present when the prehension C₂ occurs. But this position generates an epistemological problem for Broad: how is B₁, which occurs earlier than B₂, intuited as earlier than B₂? When B₁ is intuited along with B₂, why isn't B₁ intuited as being simultaneous with B₂? This is, after all, the ordinary (specious) interpretation of the situation. Broad, however, has a sense-data theorist's faith in the power of sense-inspection to uncover some characteristic of B₁ in virtue of which it could properly be seen as just past. The property Broad claims to discover is "presentedness": B₁ can be intuited as being earlier than B₂ because,
when they are apprehended together, $B_1$ can be seen to have a lesser
degree of presentedness than $B_2$.

It is unlikely, however, that presentedness can do its job in the
simple way Broad expects, and this fact will call for a reevaluation of
the role which he assigns to the givenness of sensible qualities. Even
if there is a discernible quality like presentedness, why believe
that $B_1$ is earlier than $B_2$ simply because it is intuited as having less
presentedness than $B_2$? Why not say instead that $B_1$ is simultaneous
with $B_2$ and simply has less presentedness than $B_2$? In ST Broad took
it for granted that temporal relations can be sensed: "... various
temporal relations between sensa of finite duration... can be and are
directly sensed" (ST, p. 360). Clearly, as a result of his general
epistemological commitments, Broad wants to continue to try to make
temporal consciousness largely a matter of intuitive apprehension,
where now it is lesser-degrees-of-presentedness rather than earlier-
thanness which is so apprehended. What Broad fails to appreciate is
that, as far as mere direct acquaintance is concerned, the temporal
locus of what has some given degree of presentedness is ambiguous. It
is in the context of a theory of time such as Broad's that one is led
to try to interpret (conceptually) degrees of presentedness as signs
of relative temporal location. Surely Bergson, Mabbott, and Mundle,
being disposed towards different views of time, would be eager to inter­
pret the same "data" in some alternative way. Thus, to the extent that
Broad presents his account of temporal consciousness as mainly a product
of inspection of sensa he misrepresents its true status, and he makes
it less plausible. More importantly, to the extent that he tries to
make temporal experience primarily a matter of intuitive apprehension,
he ignores the conceptual factors that are probably crucial for the
constitution of temporal consciousness.

There is a more direct argument against Broad's theses that one can
have direct sensuous contact with past sensa and that this intuition is
the heart of temporal consciousness. As the direct objects of a veri­
dical mode of apprehension, sensa are supposed to have all the properties
they appear to have, and, if apprehended sensa are apprehended as having
different properties, then they cannot be the same sensa. Ironically,
Broad used these principles in MPN to show that the direct object of
memory cannot, in general, be the remembered event: in memory what one
intuits (or images) isn't the literal past event, for, what one immedi­
ately intuits often has properties different from those of the past
event (MPN, p. 257). Now, the same reasoning can be used to show that
what is intuited to have different degrees of presentedness cannot be
identical sensum-events: if E-as-intuited at $t_2$ has less presentedness
than E-as-intuited at $t_1$ then they cannot be the same sensum, since
their determinate qualities differ, namely, their presentedness.

What Broad should have said is that different sensa can, at different
times, be "referred to" or represent the same event. But, then, there
is no motivation or need to say that one is directly acquainted with
past sensa, and Broad could use the following alternative scheme.
Here, perception of recently past events A and E is accomplished by referring successive, strictly present sensa (such as S"(A) and S'(E)) to these events. The exact mechanism for this reference is, of course, still obscure. One does not consciously reason: S"(A) has less presentedness than S'(E), therefore A must have happened before E. Most likely, one has learned to respond conceptually to certain sensory patterns with judgments like "I saw E happen just after A." So construed, the theory becomes neutral with respect to the issue whether the nexus between events and consciousness is intentional or causal, and, to whether the response is conscious or unconscious. For these reasons it can be hoped that Broad's theory might still provide a framework for a fuller scientific account of temporal cognition.  

The advantage of this modification of Broad's theory is that it separates the insights of his account from his dubious phenomenal reconstruction of temporal experience. Broad's basic point is correct: if time is a one-dimensional order, and if one can experience temporally extended processes in the strict present, then temporal consciousness must involve sensory elements whose properties differ in such a way that they can function as cues signaling the temporal order of the objects of experience. Broad's mistake was to insist that these sensory elements achieve this function by being given in some cognitive mode, and, to suggest that his theory is correct because these sensory

13The modified theory can be seen to be compatible with recent "functionalist" attempts to offer a naturalistic analysis of mind. Broad can be seen as pointing to those strictly present properties of perceptual states which are such that they can play an appropriate role in temporal cognition. For general accounts of these strategies see W. Sellars, *Science and Metaphysics* (New York: Humanities, 1968); D. C. Dennett, *Content and Consciousness* (New York: Humanities, 1969) and G. Harman, *Thought* (Princeton: Princeton University Press, 1973).
elements can be given to philosophical inspection as so functioning. As argued above, however, Broad actually posits the temporal indicating properties of sensa to meet theoretical needs, and he interprets their significance in terms of his prior theory of time. This, however, is what makes Broad's account still interesting, for, his view of time is probably correct, and experience is most likely constituted by largely unseen processes.

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