A New Analysis of Temporal Relations

The relation which is usually taken as fundamental in accounts of time is, 'x precedes y', where x and y are instants. Now, many propositions involving time are meant to have a bearing on what we experience, and hence to be, to a certain extent, verifiable ~~by~~ to a certain extent in accordance with whether the experience they predict or refer to turns out to be, as a matter of fact, of the same kind as the [redacted] proposition in question alleges it to be, or whether it exists or not. Therefore, the subject-matter of certain propositions involving time must consist partly of sense-data or memory-data and universals which concern them. Now, there seems to be no [redacted] allusion to sense-data and relations between them in the proposition, 'The instant, x, precedes the instant, y.' Instants are certainly not sense-data: instants ~~are~~ have no duration, while sense-data and memory-data have; of every pair of distinct instants, one precedes the other, while two sense-data may be simultaneous, and so on. The problem hence arises, 'How can propositions about instants be interpreted as having relevance to sense-data and memory-data?' and the further

problem, 'Can propositions about instants be interpreted as having solely to do with sense-data and memory-data?' By this latter question, I do not mean to ask if time, as we find it, stretching from eternity to eternity, can be reduced completely to relations between data of experience, but simply whether a consistent theory of time, which would give time many of the properties which it is conventionally supposed to have, can be derived from relations which we directly experience to hold between sense and memory data. I intend to show [redacted] an answer (not the only answer) to the first of these problems in what follows: I shall return to the second of these problems at the end of this paper.

A tentative answer to the first of these questions has already been given by Mr. Bertrand Russell in his, [redacted] Lowell lectures, entitled [redacted] 'Our Knowledge of [redacted] the External World'[1]. He there derives all temporal relations from the relations of partial simultaneity and complete precedence among [redacted] events - i.e. sense-data. We have shown[2] that his definition is redundant, and that simultaneity may

[1] pp. 116–123

be defined as a function of succession. Even if we remodel Mr. Russell's theory in this manner, however, it does not quite suffice for the analysis of the inferred temporal relations in terms of those directly experienced[1]. Nobody can tell by direct exper-

[1] Mr. Russell himself says (p. 122) that his account is only to be regarded as tentative and suggestive. As far as I know, Mr. Russell is the first philosopher who even suggested that instants need analysis in terms of sense-data.

ience that one sense-datum completely follows another if the time-interval between them is, say, 10. We have no right, then, to suppose that the relation of precedence which we observe when we notice that x precedes y is one which holds also between x and y if x precedes y in Mr. Russell's sense, but is not observed to precede y. It is fairly obvious that the observed relation of precedence[2]

[2] The observed relation of precedence between x and y is not the relation which consists in x being observed to precede y, although we have no right to suppose the first to connect x and y except when the second does. The difference between these two relations will be made obvious by the following consideration:

we may observe that x precedes y, and yet not be conscious of the fact that we are making this observation. That is, we may be conscious of x's having the relation to which it is observed to have to y when it precedes y, but unconscious of x's being observed to precede y. Even if this case may not occur in practice, it is an abstract possibility, and the fact that it is abstractly possible is enough to compel us to separate the two relations.

belongs to a lower stratum of elaboration than the [redacted] relation of precedence as interpreted by Mr. Russell, although I would not for a moment claim that no set lower stratum of logical elaboration is attainable. This relation of observed precedence, which I shall, for brevity, call the relation of quasi-precedence, should not, moreover, be treated as a single relation for all conscious beings [redacted]: as no two people, in all probability, ever have the same sense-datum, we shall have a separate relation of quasi-precedence for every person, and

hence, as a consequence, a separate series of instants for each person. Later, these can be, no doubt, correlated, and used as the basis of a single series (or other relation, if the principle of relativity be taken as valid in physics[1]), but

[1] Cf. Robb, A New Theory of Space and Time.,

this later synthesis is much more complicated than the synthesis of the sense-data of an individual into instants, and presupposes a great body of physical considerations, most of which have never been made, so we shall not attack this later problem in this paper.

The relation of quasi-precedence holds between two sense-data, then, when the second begins noticeably after the first is over. It might seem justifiable for us to assume that the relation of quasi-precedence is transitive and asymmetrical: that is, that if x quasi-precedes y, and y quasi-precedes z, x quasi-precedes z, and that if x quasi-precedes y, y never quasi-precedes x