

## CHAPTER 7

### The Tenseless Theory of Time

We have noticed in the previous chapter that McFaggart's main contention has been that the A-Series of temporal facts involves contradiction. A large number of twentieth century philosophers have tried to show that the reality of time does not require the A-series. They do not of course deny the reality of time; but they refuse to accept the dynamic aspect of time. They maintain that events are not really past, present or future. So the question of an event being changed from pastness to presentness, or from presentness to futurity does not arise. According to these thinkers, events are ordered in permanent B-relations of simultaneity, precedence and succession. These relations between events are describable in a tenseless language. This view is known as the tenseless theory or B-theory of time. The tenseless theory alone, these thinkers hold, can save time from the McFaggartian charge of a vicious infinite regress.

The B-theorists have advanced two different kinds of arguments to show that the temporal determination of events as past, present and future are subjective. The first kind of arguments is a priori, since it is based on a conceptual analysis of the ordinary concepts of temporal determinations. The B-theorists claim that the very meaning of present (or past or future) is such that an essential reference is made to a subject.

In the empirical kind of arguments, on the other hand, the B-theorists seek support from the discoveries of modern science of their claim about the mind-dependency of temporal determinations. Russell, Smart, Quine, Grunbaum with many other thinkers have argued for this theory, while Broad, Reichenbach, Prior, Gale, Schlesinger have offered arguments to repudiate this view.

#### Linguistic Approach of the B-theorists

Bertrand Russell was the chief upholder of the tenseless theory of time. Since 1903 when his The Principles of Mathematics<sup>1</sup> was first published, the issue turned mainly on the translatability of contingent tensed statements into tenseless statements about permanent relations between events. The B-theorists have tried to prove that tensed A-expressions are translatable into tenseless expressions of B-relations

between events. An event is not past, present or future intrinsically; it is merely earlier than, simultaneous with or later than some other chosen event. As Nelson Goodman puts it :

"The past, present and future name no times. Rather the 'is past at', 'is present at', and the 'is future at' are tenseless two-place predicates that may respectively be translated by the tenseless predicates 'is earlier than', 'is at' and 'is later than'."<sup>2</sup>

The chosen event, the B-theorists say, is either a linguistic event or a mental event. A-expressions are reducible to B-expressions either by (A) Linguistic Reduction or by (B) Psychological Reduction. It is said that A-determinations involve a reference to a subject either as a language-user or as a perceiver. So if there were no language-users or perceivers in the world, there would still be a B-series of time, but there would not be any A-series.

(A) Linguistic Reduction : Token Reflexive Analysis :

According to the B-theorists, to say that an event occurred or will occur, simply means that it occupies a time earlier later than my statement about it. That is to say, an A-statement asserting a particular A-determination is

situational; it signifies the speaker's temporal relation to the event reported by his statement. The B-theorists as linguist philosophers accept Hans Reichenbach's<sup>3</sup> token-reflexive analysis of statements. By 'token' Reichenbach means an individual sign. A token-reflexive word or sentence is one every token of which refers to itself. Hence the statement 'M is past (present or future)' can be analysed into the statement 'M is earlier than (simultaneous with, later than) this token'. Here 'this token' refers to the occurrence of the entire sentence within which it occurs.

The most sophisticated token-reflexive analysis of A-statements has been developed by J.J.C. Smart<sup>4</sup>. The statement 'The boat was upstream, is level, will be downstream', can be analysed, Smart says, in the following manner : the occasions on which the boat is upstream are earlier than this utterance, the occasion on which it is level is simultaneous with this utterance, and the occasions on which it is downstream are later than this utterance. Smart claims to have devised a tenseless language in which there are no tensed copulas. In such a language the words 'earlier than', 'later than' and 'simultaneous with' are used in combination with a non-temporal copula and the expression 'this utterance'.

It should be noted that 'this utterance' in the above analysis has not been used in its ordinary tensed sense,

where 'this' would mean 'the person, thing or idea present'<sup>5</sup>. Smart has used it in a tenseless way, that is directly self-referential.

The Token-reflexive analysis, Smart contends, reveals the latent anthropocentricity or linguocentricity of A-expressions; that is to say, these expressions refer to a token produced by some person or language-user and are without cosmic significance. As in this analysis all tensed verbs and copulas have been eliminated, the detensed statement describes a B-relation between an event and the occurrence of the sentence-token.

But it may be urged that when a statement, for example, 'M is past' is rendered as 'M is earlier than this token', the latter does not fulfil the requirement of an ideal tenseless language. In such an ideal language the sentences occurring in it must be freely repeatable. While the B-theorists seek to create an ideal language by eliminating tensed verbs and copulas, there is every room to doubt whether they have succeeded in doing so. For both 'M is Past' and 'M is earlier than this token' are subject to the same temporal conditions for making true statements; that is to say, they are to be used later than the occurrence of the event M. But to achieve free repeatability an A-statement must be reduced to a genuine B-statement expressing a permanent B-relation between two events.

It may also be urged that when a statement, for example, 'This chair is now red' is rendered as 'The chair's being red is (tenselessly) simultaneous with this token', the two sentences do not mean the same thing. The latter statement entails that there exists a token, but the former does not. Statements having different entailment relations cannot have the same meaning. This is evident from the fact that the sentence 'The chair is now red even though no token occurs' is not self-contradictory. It is contingently false. Our ordinary conception of A-determinations do not contain any reference to a language-user or a linguistic token. There is no contradiction in conceiving of the world devoid of language-users and linguistic tokens. In such a world a chair may exist being red without any linguistic-token corresponding to it. Most of the physical events, as Moore<sup>6</sup> says, are percipient-independent. This entails that most of the physical events are utterer-independent. So the chair may be red now, though nobody perceives it now and no sentence - token occurs. This shows that the statement 'The chair is now red, though no token occurs' is only contingently false. But a statement like 'The chair's being red is (tenselessly) simultaneous with this token, even though no token occurs,' is utterly self-contradictory.

Date-Sentence Analysis of Tensed Sentences :

Some B-theorists<sup>8</sup> translate A-statements into B-statements by ascribing tenselessly a date to the event reported by the original statement. 'It is now raining' can thus be rendered, for example, as "Rain is at December 20, 1992". It has been claimed that this kind of rendering expresses a timeless B-relation between the event and the date. These thinkers believe that language can be detensed in this way without loss of meaning, and that A-determinations are not intrinsic to events. In modern mathematical logic we find such tenseless ascriptions of date. For example, 'There is a sea-battle, which is at December 20, 1992'. Here the 'is' of the existential quantifier, and the 'is' of the characterising copula are tenseless. Quine<sup>9</sup> claims that this tenseless mode of existential quantification provides the most suitable kind of description of Minkowskian<sup>10</sup> four-dimensional space-time as employed in the theory of relativity. On this theory the whole history of physical phenomena is laid out as a changless whole devoid of any distinction between past, present and future.

Richard Gale<sup>11</sup> has an argument against the date-sentence theory. He says that a date-sentence does not indicate whether the described event is past, present or future; so this kind of analysis fails to analyse tensed sentences. But this argument of Gale begs the question, for it assumes that

tensed sentences refer to events with A-determinations. But the detensers precisely deny this very assumption.

Against the detensers it may, however, be urged that a tensed sentence like 'The boat is level now' is true, if, and only if, it is uttered simultaneously with the event referred to. But a tenseless date-sentence like 'The boat is level, on July 20, 1992' has temporally unrestricted truth-conditions; if this sentence is once true, it is true on every occasion of its utterance. Since the above two kinds of sentences have different truth conditions, it follows that the date-sentence is not the proper analysans of the tensed sentence.

(B) Psychological Reduction : Ego Centric Particular Analysis :

Russell<sup>12</sup> argues that A-determinations involve a B-relation to a perceiver or utterer. So an A-statement such as 'The chair is now (was or will be) red' can be rendered as 'The chair's being red is (tenselessly) simultaneous with (earlier or later than) this', in which 'this' is a logically proper name for a sense-datum experienced by the speaker at the time he makes this utterance.

But it is to be noted that a sense-datum is a mental event which, in principle, cannot be experienced by anyone other than the person who is reporting it. So it can be said

that A-determinations contain a reference to a mental event. This kind of analysis of A-determinations can be called ego-centric particular analysis. It seeks to establish that A-determinations are psychological, and that the temporal determinations of an event is analysable in terms of B-relations consisting of expectation, perception and memory of a percipient.

But it may be urged that this kind of analysis renders communication impossible. The 'this' here is a sense-datum private to the speaker. Only the speaker can know the referent of 'this'. So it seems impossible for the hearer to know the event which is simultaneous with the chair being red.

From the discussion above, it appears that both the (A) token-reflexive and (B) ego-centric particular analyses distort the meaning of our ordinary temporal expressions. Ordinary language involves a realistic attitude towards A-determinations, which is not satisfied with these sorts of analysis.

A-theorists agree with McTaggart as regards his positive thesis that time involves the A-series of temporal facts and that the A-series is more fundamental. But they refuse to accept his negative thesis, that this series involves a vicious infinite regress. They have also questioned the validity of the reduction of A-statements into B-statements.

They have distinguished the time-words of the A-series and B-series by three prominent features :

(i) the words of the A-Series imply a time-flow --- events flowing from the future through the present to the past<sup>13</sup>. No such flow is associated with the time-words of the B-Series in which events are changelessly connected with one another. Bergson<sup>14</sup>, perhaps, in anticipation of this kind of conception, denied that there can really be any static temporal series at all. He said that if we try to conceive time as a static geometrical line, we are really thinking of space;

(ii) the most prominent feature of the time-words of the A-Series is that they are indispensable in our expressions of emotions and actions. If one utters with a sigh of relief, 'Thank goodness , it's over'<sup>15</sup>, then the utterance expresses the fact that someone is pleased that on such and such date something is over. It does not merely mean that the unpleasant thing is earlier than the utterance on such and such date. B-statements fall short of expressing these mental attitudes;

(iii) the third feature has proved to be the most controversial one. It has been claimed by the B-theorists that the words 'past', 'present', 'future' and 'now' are all defineable, in terms of 'this utterance' or 'this token'. But the A-theorists contend that these kinds of rendering do

not fulfil all the requirements of an ideal language<sup>16</sup>.

Mellor's thesis : Recently Hugh Mellor has upheld McTaggart's idea that the A-series involves contradiction. He has further admitted that it is not ultimately possible to reduce the notions of past, present and future to simply those earlier and later relations. In Mellor's opinion tense is indispensable for the expression of any phenomenon which is backward or forward looking. By 'tense' Mellor does not mean merely the grammatical one; tense involves anything that can be expressed by tensed utterances. As he puts it, "what I call tense need not be marked by modifying verbs"<sup>17</sup>. By 'tense' Mellor means, "the present, and temporal distances from it, past and future"<sup>18</sup>. By 'tensed' statements he means those that say how near or far from the present, past or future something is.

Mellor does not think that tense is subjective. Past, present and future tensed statements, he says, are objectively true or false independently of our consciousness. Mellor's thesis is based on the contemporary philosophical theory that meaning has to do with truth conditions. He maintains that the truth conditions for tensed utterances can be stated in tenseless terms. As he says, "their tenseless truth conditions leave tensed facts no scope for determining their truth values. So in reality there are no such facts"<sup>19</sup>.

Mellor's thesis is against tensed facts; though tensed utterances are indispensable, there are no such facts; the necessary and sufficient truth conditions required for such expressions, Mellor says, are tenseless facts : 'e is past' is true, if, and only if the expression using the token 'e is past' is after e. For determining the truth of the tensed sentence-token 'e is past' no reference to tensed facts is required. That role is performed by tenseless facts. So the hypothesis of tensed facts is redundant.

Mellor contends that, if for determining the truth of any tensed statement, reference to tensed facts were required, then that would involve an infinite regress. To say, for example, " 'e is past' is true, if and only if e is now past", does not end the matter there. For it will then need further clarification : that, what has been said is true, if e is past now, and again that will be true, if e is past now now, and so on indefinitely. Thus Mellor wants to show that any attempt to state the truth conditions in a tensed way, but also conclusively, is bound to lead to an infinite regress. But if we want to stop at any stage and give a definite answer, that will produce a contradiction. For if the sentence is true at some present time, it must be false at some other time.

But Mellor's argument seems to be misleading. A parallel argument might be formulated to point out the

mistake implicit in the argument. It might be said that something is a triangle, if it is trilateral. So someone might urge that this is the truth condition for the statement that something is a triangle, that this is all that is required for the truth of the statement. So it might appear that there is no scope for any reference to any other fact such as the objectivity of triangles. But if somebody claims that it is an objective fact about something that it is a triangle, or about an event that it is past, then in order to rule them out as facts, something more is necessary than merely to state the sufficient and necessary truth conditions for such statements.

With regard to Mellor's contention that any attempt to state the truth conditions conclusively leads to an infinite regress, it might be said that this involves a failure to see tensed utterances for what they are. When someone says that 'e is past', there is no indefiniteness in the utterance. There may, of course, be indefiniteness in some special cases, when we come across a tensed sentence written down without our knowing the circumstances in which it was written. But when the circumstances of a tensed utterance are taken into account, there remains no indefiniteness as to its meaning.

Similarly, it may also be said that McTaggart fails to see the obvious properties of token-reflexive expressions. We do not find any difficulty in understanding

token-reflexive expressions. There would of course be real trouble if these expressions would require, as Mellor's thesis suggests, further token-reflexives in their statement. For this would bring us to the beginning of an infinite regress.

Michael Dummett<sup>20</sup> has opined that the objection that McTaggart was blind to the properties of token-reflexives misses the point and involves a grave misunderstanding. He thinks that McTaggart was quite aware of the peculiarity of temporal token-reflexives. That is why he did not produce similar paradoxes with regard to 'here' and 'there', 'I' and 'you'. It is to be admitted that there is an asymmetry between time and space. One can change one's position in space, but the same is not possible with regard to time. This asymmetry of time and space gives temporal token-reflexives a greater importance in our conception of time than spatial token-reflexives have in our conception of space. Token-reflexive expressions enter essentially into the statement of the pastness, presentness or futurity of events. Dummett says that the spatial token-reflexive expressions are not essential to the description of objects in space.

But this part of McTaggart's argument, according to Dummett, demonstrates the reality of time, not its unreality. For it shows that time cannot be reduced to anything else. He alleges McTaggart of taking for granted that there must be a complete description of reality. Since we cannot

describe temporality without using token-reflexive expressions, there can be no such complete description. From this McTaggart concludes that time must be unreal. But this conclusion, Dummett thinks, is self-refuting. As he puts it,

"Clearly even if the world is really static, our apprehension of it changes. It does not help to say that we are even mistaken about what we think we see, because the fact would remain that we still make different such mistakes at different times"<sup>21</sup>.

#### The Empirical Arguments of the B-theorists

B-theorists have advanced empirical arguments also in favour of their thesis that temporal becoming is subjective. These arguments are based on the findings of modern science, especially on the theory of relativity. Before we discuss them let us try to understand the concept of 'becoming' or 'temporal passage'<sup>22</sup>.

In his famous novel The Magic Mountain, Thomas Mann writes, "Time has no divisions to mark its passage, there is never a thunderstorm or blare of trumpets to announce the beginning of a new month or year. Even when a new century begins, it is only we mortals who ring bells and fire off pistols"<sup>23</sup>.

The Passage of Time :

The notion of temporal passage, however, is deeply embedded in our commonsense conception of time. The expression 'the river of time' signifies this notion of passage. Temporal passage is conceived in two opposite ways :

(i) either, we think of ourselves as moving from the past, through the present into the future;

or,

(ii) events are conceived as coming towards us from the future; they touch us in the present and then recede behind us into the past. This very fact has been articulated by McTaggart as the dynamic aspect of time. The notion of temporal becoming is another way of thinking about the matter. As Grunbaum puts it :

"It is this occurring or coming into being of previously future events and their subsequent belonging to the past which is called becoming"<sup>24</sup>.

Grunbaum admits that becoming is a prominent feature of our temporal awareness. But the question is : Is it also a feature of reality independently of our awareness of it ? Much controversy has centred on this issue.

As a reaction to McTaggart's analysis of time, a large number of twentieth-century philosophers hold that the

transient view characterises time, by misleading metaphors such as 'flying', 'passing' or 'the river of time'. But according to these thinkers, events cannot literally move; they exist tenselessly. The tensed characterisations such as past, present and future are not genuine properties of events. This view leads them to conclude that temporal passage is a myth<sup>25</sup>. There is no such thing as the moving now; time does not move at all.

#### Events and the Time-flow :

It has been already mentioned (in Chapter 2) that the problem of reconciling the notion of temporal passage with the idea of unrepeatability of existence of particular events was first recognized by St. Augustine<sup>26</sup>. In his opinion the past and the future can be recalled or anticipated respectively. So they must exist in some sense. But wherever past and future times may exist, Augustine says, they cannot exist there as 'past' or as 'future'. For by definition the past is that which is no longer and the future is that which is not yet. So, Augustine concludes, if the past and the future are to exist at all, they must exist there as 'present'.

The same kind of puzzlement has been expressed by Moore<sup>27</sup> also. He says that when an event is present, that is a characteristic which the event cannot possess when it

is absent. But an event cannot possess any characteristic when it is not present; so how can an event possess the characteristics of pastness or futurity when by definition it is not present ?

Now, Augustine and Moore were not B-theorists in any sense of the term. On this point, however, B-theorists agree with them. C.D. Broad<sup>28</sup>, as a B-theorist, pointed out that it is misleading to analyse a tensed statement such as 'It has rained' as that there is a 'rainy event' which momentarily possessed the quality of presentness, and then lost it and acquired pastness. Broad means that when an event X is not present, it occupies a moment either before or after my statement about it. Thus Broad claims that an event does not undergo any changes, but it must continue to be. The Battle of Hastings preceded the Battle of Waterloo, hence it must eternally continue to precede the later event; for both events must be eternally at their respective moments. Broad, as a B-theorist, did not recognise any ontological distinction between events. All events, according to him, are equally real and determinate. The past and the future exist no less than the present. But past and future are not essential characteristics of events. With Russell, Broad admitted that past, present and future are analysable into external relations of statements of minds and their objects.

Thus in this theory events are conceived as constituting a linear series along which the subject or consciousness travels. This conception has been described by him in the following manner :

"Along this, and in a fixed direction we imagine the characteristic of presentness as moving somewhat like a spot of light from a policeman's bull's eye traversing the fronts of the houses in a street. What is illuminated is the present, what has been illuminated is the past, and what has not yet been illuminated is the future"<sup>29</sup>.

This theory has in the above way been described and rejected by Broad himself in his later accounts as the 'police-man's bull's eye theory'. He admits that this kind of thinking commits oneself to an infinite regress of time-series. If presentness or the now moves, it must move along the static series of moments which is to be regarded as the first-order time-series. The acquisition and the immediately subsequent loss of presentness or nowness of an event, would then have to be regarded as an event of the second-order time-series. That is to say, we would have to postulate a second time-scale with respect to which the movement of presentness along the first-order time-series is to be measured. Broad thinks that only in this way the notion of temporal passage can be explained<sup>30</sup>.

But this would lead us to postulate an infinite number of higher and still higher dimensions of time. Moreover, it seems to be an ontological wastage that in order to save a particular view of time, one should have to postulate different orders of time.

The notion of temporal passage, however, received vigorous attacks from Smart<sup>31</sup>. Smart alleges that we hypostatise time as we think of it as a liquid on which events float. Smart says that events cannot change; it is only things that can change or become something else. A traffic light, for example, can change its colour from red to green. But it makes no sense to speak of a change to that change. Events only happen. Broad also said that events do not change; but he said that they become; by this he meant that events come into existence. But Smart does not agree with him, for he thinks that events do not come into being; they just occur.

Smart distinguishes events from processes. 'Running a race' or 'fighting a battle' are processes, but 'winning a race' or 'victory' are events that neither do nor do not change. A person's birth, death or marriage are events, but his life is a process. Smart seeks to establish that the concept of change does not apply to events.

But Schlesinger<sup>32</sup> does not agree with Smart in holding that attributing changes to events is to commit a category

mistake. With Smart he admits that an event obviously cannot change colours like a traffic light. But, according to Schesinger, that is no reason to think that it cannot change with respect to a property that it does have at present. It may be said that every event is related in a specific way to the 'now', and is capable of undergoing changes in that relationship. Schesinger does not find any inconsistency in this conception.

However, Smart<sup>33</sup> contends that the notion of time-flow prevents us seeing the world as it is. Our common thinking with regard to events, things and the so-called time-flow is the source of all perplexities with regard to time. As it has been suggested by Smart, we should replace these notions by the Minkowskian idea of a four-dimensional space-time which exists tenselessly. Temporal facts are facts of before and after and of simultaneity. On this view time is very much like space consisting only of unchanging relations among objects and events. These objects and events exist in the tenseless sense of 'exist'. The concepts of past, present and future have significance relative only to human thought. They do not apply to the universe as such.

Smart draws an analogy between 'past', 'present' and 'future' and colour concepts. Each of them is intersubjective as dependent on individual forms of consciousness for their application. They all contain a hidden anthropocentricity.

The concepts of earlier, later and simultaneity on the other hand, Smart says, are non-anthropocentric.

Similar arguments have been constructed by Merleau-Ponty<sup>34</sup> to show that time is subjective. Time, he says, is a function of individual human consciousness; even the notion of an event has no place in the objective world.

M. Ponty anticipates the obvious objections to this claim for the subjectivity of temporal concepts, that events surely took place before there were any conscious beings in this world. It is as well imaginable that events will be taking place even after conscious beings have ceased to exist.

As a phenomenologist M. Ponty claims that the meaning of a concept is to be understood in perceptual terms only. So any claim for the existence or occurrence of events before the existence of conscious beings is to be justified by the verification that can be made of them by conscious beings now. Thus M. Ponty's verificationist theory of meaning gives rise to his thesis that temporal concepts are subjective.

It might significantly be asked, if time is a purely subjective notion, how do we attain a common understanding of time and its passage? The notions of past, present, future are intersubjective notions — we have a common conception of them. M. Ponty says that it is because of the lived present, that we all share, that the intrinsic subjectivity

of consciousness is transcended. The lived present provides a common ground for our individual pasts and futures which are tied to our individual consciousness. But there would be no such temporal concepts without this individual consciousness.

This view of M. Ponty is very close to Smart's view that past, present and future are anthropocentric notions. But this does not conclusively prove that temporal concepts are non-objective.

Let us consider the case of colour concepts. There are some philosophers who maintain that colour is a subjective phenomenon, for the perception of colour of things depend on our sensibility. But colour concepts are intersubjective too. So it appears that when we see a particular colour of a thing, the reason is not entirely within us; there must be some objective basis also. Physics explains that the wave-length of the light reflected from an object is in part responsible for our perceiving a particular colour. In the same way, it can be said that there must be something about time itself for which events are taken as past, present and future. It is obvious that if there were no conscious beings with temporal consciousness, there would be no ascriptions of pastness, presentness and futurity to events. But there would still remain the possibility of such ascriptions by possible conscious beings.

The upshot of the discussion above is that the thesis of the non-objectivity of temporal concepts has been supported by a large number of philosophers. They have offered various arguments in support of their thesis. They have tried to show the inherent inconsistencies the idea of a temporal passage. Some of them appeal to the findings of modern science and to the theory of relativity, to establish the subjectivity of temporal concepts. We shall now consider these empirical arguments.

#### The Ontological Status of Past, Present and Future

Adolf Grunbaum<sup>35</sup> develops his thesis of the mind-dependency of temporal concepts and temporal becoming against his rival thesis that temporal becoming is mind-independent. The central point in the problem of time, according to Grunbaum, is the status of the present; for the past and the future are characterised by him as being before and after the present. So the issue of the mind-dependency of becoming, Grunbaum thinks, turns on the so-called transient 'now'. The 'now' or the present is ordinarily conceived as an attribute of events directly apprehended in perceptual awareness. Grunbaum refers to some relevant scientific facts that must be taken into account in order to determine the status of the present. As commonsense view is scientifically untutored, Grunbaum says,

both of the following physical events are characterised by it as 'occurring now' or 'belonging to the present' : two events are observed at the same time  $t$ ; one of them is a stellar explosion that occurred several million years before  $t$ , but which is seen on earth at  $t$ ; the other event is a flash of lightning, that occurred in a fraction of a second before  $t$ , and observed at  $t$ . Grunbaum thus seeks to establish that presentness of an event, or the simultaneity of two events is only apparent and not real; that is to say, it is not for any physical attribute of an event that we qualify it as belonging to the present. Grunbaum admits that present day commonsense beliefs have begun to allow for the finitude of the speed of light. But he reminds us that commonsense view mistakenly associates absolute simultaneity with the 'now'. But as a matter of fact, Grunbaum contends, when a particular human being, say  $M$ , experiences an event at time  $t$ ,  $M$  is conceptually aware of experiencing at that time either the event or any other event simultaneous with it in  $M$ 's reference frame. Thus Grunbaum appeals to the theory of relativity to justify his claim that the nowness of an event is mind-dependent.

But it might be pointed out that the scientific fact referred to here does not lend support to Grunbaum's thesis. It is to be admitted that commonsense sometimes mistakenly ascribes presentness to the visual effects now of an event

which in actual reality occurred several millions of years before it. But that does not prove that presentness has no objective basis. The presentness of the actual event can of course be calculated in accordance with the data of the finitude of the velocity of light. So if a human being is experiencing at present a stellar event 10 light years away, it can validly be inferred that the event occurred or was present ten years ago. The relativity theory only suggests that the nowness of a physical event is to be construed relativistically. The special theory of relativity denounces absolute simultaneity of distant events. But that does not entail that physical events lack nowness even in a relativistic sense. So Grunbaum's thesis that nowness is merely a conceptual awareness of one's own experiences, that nowness is mind-dependent, does not seem to have a solid foundation.

Smart, Weyl<sup>36</sup> and Grunbaum and their followers have admitted that temporal becoming is intrinsic to mental events. But mental events are correlated with and causally dependent upon events in the brain. Hence it seems that mental events would come to be and cease to be in our personal experience, while physical events would neither come into existence, nor cease to exist, but would just remain for ever in fixed relationships. Such a view results in peculiar consequences : Let it be supposed that someone decides to drop a stone into a pond; the decision, on this theory, suddenly comes into

being, while the splash on the water caused by stone-throwing would just be. This appears to be an unintelligible situation.

In support of his thesis Grunbaum claims that if nowness were a real feature of reality then physical sciences would make allowance for such notions of presentness in the theories of physics. Against this contention it might be urged that in some branches of science the distinctions between past, present and future are vital. For example, a meteorologist who is engaged in forecasting the weather is concerned about the future, whereas a palaeontologist studying the fossil records on rocks is concerned about the past. Milic Capek has also shown ample use of the notion of present and of its correlatives past and future in the physical theories. So Grubaum's claim seems to be unjustified. It might be added that his theory of the mind-dependency of the notion of presentness, or for that matter of temporal becoming, is a philosophical interpretation of the theory of relativity, which does not provide a complete account of time and temporal consciousness.

It is, of course, true that modern physics, or to be more specific, quantum mechanics has introduced the idea of 'imaginary time'; the Newtonian idea of an absolute time has been abandoned. Time is now a personal concept relative to the observer. In such a conception there is no important difference between forward and backward directions of time,

that is, between the future and the past. This conception, however, recognizes three arrows of time<sup>37</sup> : the thermodynamic arrow — (i) the direction in which entropy or disorder increases;

(ii) the psychological arrow — the direction in which we feel that time passes from the past to the future, so that we remember the past and not the future;

(iii) the cosmological arrow — the direction in which the universe is conceived as expanding.

It has been explained that the psychological arrow of time is determined by the thermodynamic arrow; they point to the same direction. We remember things in the order in which disorder increases. The intact cup is a state of order, while the broken pieces of the same cup represent a disordered state. And we remember the intact cup breaking into pieces, not the pieces gathering themselves together to form the unbroken cup. These two arrows of time coincide with the cosmological arrow of time. That is to say, all the three arrows of time point to the same direction. So this new conception of physics seems to recognise that there is some distinction between the past and the future, and that the past, present and future are not mere subjective phenomena.

An Indian View About the Status of the Present

Grunbaum has asserted that the central point in the problem of time is the status of the present. He has developed the theory of the subjectivity of temporal determinations on the thesis of the non-existence of the present time.

There is an ancient Indian view mentioned and repudiated by the Nyāya thinkers. The view runs as follows : there is no present time, since the present is not identifiable. When a fruit, for example, loosened from a stalk, is falling on the ground, the path through which it has fallen is connected with past time; the path below, which it has yet to fall, is connected with future time. As there is no third part of the path to be connected with the present, there is no present time.

According to some Indian scholars<sup>38</sup> this is a realistic theory that repudiates the existence of the present, but accepts the reality of the past and the future.

But it should be pointed out that the view under consideration is quite similar to that held by Nāgārjuna; the argument is also similar. It appears that the existence of the past and the future have been accepted for the sake of the argument. The aim of the argument seems to deny all the

divisions of time through the denial of the present.

In Nyāya-Sūtra<sup>39</sup> we find a criticism of this view. The Nyāya thinkers realised the importance of conceiving the present as a duration and not as an instant. They have insisted that time should not be understood with reference of space. The Nyāya is a realistic and pluralistic system. Among other objects it recognises absolute time. But the discussion here is about relative or empirical time. Empirical time arises from the association of absolute time with action. In the given case, the action of the falling of the fruit indicates present time<sup>40</sup>. The Nyāya thinkers realised the necessity of conceiving the present as a duration and not as an instant of zero duration. As we have seen, Augustine was also puzzled with regard to the existence of the present for the same reason. If the now or present is taken as an instant of zero duration, time eludes us. Whitehead has conceived the present as a duration. The duration of the present Whitehead says, need not necessarily be same in all cases<sup>41</sup>.

## REFERENCE

1. B.Russell, Principles of Mathematics, op.cit, p.469.
2. Nelson Goodman, The Structure of Appearance, Cambridge, 1951, p.295.
3. Hans Reichenbach, Elements of Symbolic Logic, New York, 1948, pp.50-1.
4. J.J.C.Smart, ' "Tensed Statements" : A Comment', Philosophical Quarterly, 12, 1962.
5. Webster's Seventh New Collegiate Dictionary, 1967, p.199.
6. J.J.C.Smart, Philosophy and Scientific Realism, London, 1963, p.134.
7. G.E.Moore, Philosophical Papers, London, 1959, p.52.
8. Russell, Principles of Mathematics, op.cit, p.471.
9. Quine, 'Mr. Strawson on Logical Theory', Mind 62, 1953, p.443.

10. H.Minkowski, who first proposed the fusion of space and time into the relativistic conception of a four-dimensional continuum of point-events, which was called by him 'The World'.
11. Gale, The Language of Time, London, 1968, pp.55-6.
12. Russell, 'On the Experience of Time', Monist 25, 1915, pp.212-33.  
Similar views have been expressed by R.B.Braithwaite and other thinkers.
13. Whitrow, op.cit Chap-VI; Milic Capek, The Philosophical Impact of Contemporary Physics, Princeton, 1961, Chapter XVII.
14. Bergson, Time and Free Will, op.cit, pp.90-1.
15. Prior, 'Thank Goodness, That's Over', Philosophy 34, 1959, p.17.
16. Gale, The Language of Time, op.cit, pp.25-7.
17. Mellor, Real Time, Cambridge, 1981, p.4.
18. Ibid, p.3.
19. Ibid, p.19.
20. M.Dummet, 'A Defence of McTaggart's Proof of the Unreality of Time', Truth and Other Enigmas, London, 1978, p.356.
21. Ibid, p.
22. Time and temporality has often been compared with a flowing river not only by ordinary people but by many philosophers, eastern and western, as well.

In Bhartrhari's Vākyapadiya there is a beautiful kārikā as noted below :

Tṛṇaparnālatādīni yathā sroto'nukarsati. /  
pravartayati kālo' pi mātrā mātrāvatām tathā//kārikā 41 //

:just as the river drives away grass, leaves, creepers etc. so ever-active time too takes away beings, and causes changes in their qualities.

It should be pointed out that, to Bhartrhari Time or Kāla is the power or Śakti of Brahman. It is eternal and unchangeable, yet it is the cause of all changes or motions or orders of the world. The coming into existence and passing out of existence of all things is caused by time alone.

The Kālasamuddesa of Bhartrhari's Vākyapadiya (together with Helārāja's commentary), tr. Peri Sarveswara Sarma, Delhi, 1972.

23. Thomas Mann, The Magic Mountain, tr. Lowe Porter, 1928.
24. Grunbaum, Modern Science and Zeno's Paradoxes, Middletown, 1967, p.67.
25. D.C.Williams, 'The Myth of Passage' The Philosophy of Time, Gale (ed.), pp. 98-115.
26. Augustine, op.cit, Bk XI, 171-8.
27. Moore, The Common-Place Book of G.E.Moore, Lewy (ed.), London, 1962.P.97.

28. Broad, 'Time', Hastings Encyclopaedia of Religion and Ethics, New York, 1951.
29. Broad, Scientific Thought, 1952, p.59.
30. Broad, An Examination of McTaggart's Philosophy, Vol.2, Part-I, Cambridge, 1938.
31. Smart, 'The River of Time', Essays in Conceptual Analysis, Flew (ed), London, pp.213-27.
32. Schlesinger, 'How Time Flies', Mind 91, 1982, pp.501-23.
33. Smart, Philosophy and Scientific Realism, op.cit, p.132.
34. Merleau-Ponty, The Phenomenology of Perception, Tr. C.Smith, London, pp.411-12.
35. Grunbaum, op.cit.
36. Weyl : "The objective world simply is; it does not happen. Only to the gaze of my consciousness, crawling upward along the lifeline of my body, does a section of the world come to life as a fleeting image", Philosophy of Mathematics and Natural Science, Princeton, N.J., 1949, p.116.
37. Hawking, op.cit, pp.151-61.
38. S.Bhaduri, Studies in Nyāya-Vaiśeṣika Metaphysics, Poona, 1947, pp.206-7.
39. Nyāya-Sūtra of Gautama, 2,1,39, Calcutta.
40. Nyāyabhāṣya of Vātsāyana, ed. Beneras.
41. Whitehead, Principles of Natural Knowledge, Cambridge, p.64..