

A COMPARISON OF TENSED
AND TENSELESS SENTENCES

by

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B.A. (Hons.), Simon Fraser University, 1969

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS
in the Department of
Philosophy

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SIMON FRASER UNIVERSITY
July, 1970

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ABSTRACT

In the first half of this thesis I outline and criticize two recent philosophical contributions to the study of time. The first work criticized is Gale's book The Language of Time. Gale tries to show that there are two theories of time. He presents these theories by giving four main tenets of each. I argue that if someone accepts the first tenet of the theory Gale calls 'the B-Theory', he cannot hold any of the remaining three tenets and regard them as significant or interesting claims. However, the first tenet of the B-Theory is worth detailed consideration. It expresses, in effect, the following claim: tenseless language containing only the temporal notions of precedence, simultaneity and subsequence is adequate to describe the world. The second work I criticize is Reichenbach's proposal to eliminate tenses and words such as 'now', 'past', 'present' and 'future'. I discuss and modify Reichenbach's proposal, in part by using material from Goodman's, The Structure of Appearance.

In the second half of the thesis I argue that the tenseless language which results from replacing tenses and the words 'now', 'past', etc. with relational temporal expressions such as 'earlier than', 'later than' and 'simultaneous with' is an adequate language for describing the world. The first part of the argument is a defense against Gale's claim that there are facts expressible only in tensed sentences. The second part of the argument is a discussion of what is involved in comparing two systems of discourse in respect of their descriptive capacities. This done, I argue that all we could say about the world in a tensed history could also be said in a tenseless one.

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1. INTRODUCTION

In the first half of this thesis, sections 1-3, I outline and criticize two contributions to the philosophical investigation of time. The first work reviewed is Richard Gale's, The Language of Time. The second thing discussed is Reichenbach's and Goodman's proposals to replace tenses and words such as 'past', 'present' and 'future' with tenseless verbs and relational predicates such as 'earlier than', 'later than' and 'simultaneous with'.

In the second half of this thesis, sections 4-6, I try to show that the proposal to replace tenses and the words 'past', 'present', and 'future' is acceptable because tenseless sentences containing temporal relations are by themselves sufficient to describe the world.

One of Gale's main contentions in The Language of Time is that what is said in some tensed sentences cannot, without loss of factual content, be said in a tenseless sentence. Gale reports McTaggart as holding that "...there are two different kinds of temporal facts. First there are facts about temporal relations of precedence and subsequence between events, and second there are facts about the pastness, presentness and futurity of these same events" (pp.8-9). Gale's contention is that tensed sentences can express both kinds of facts; but tenseless ones can express only the first. In part Gale argues that even if hearing S enables one to discover through non-logical means that p, still p is not part of the descriptive meaning of S if non-logical means of discovery are required by the hearer. I counter this by arguing that what requires non-logical means of discovery depends on what the hearer already knows: one person hearing S may require non-logical means of determining that p and another may not.

Gale's entire discussion in his book is cast in the form of a comparison of two opposed theories of time. He begins by trying to distinguish "...two fundamentally different ways in which we conceive of and talk about time" (cf.p.7). He calls these two modes of speech and thought the dynamic and the static views of time. I will outline them separately.

Tensed verbs and the following expressions are part of the language Gale says is used to express the dynamic view: 'past', 'present', 'future', 'now', 'is over', 'will happen', etc. Gale calls these A-expressions. Sentences containing such devices are called A-sentences, for example: 'It was raining', 'It is now 3 o'clock', 'It will soon be over', 'He is here'.

Time-and-date predicates, e.g. '3 A.M. G.M.T., 12 November 1947', and the relational predicates of time 'is earlier than', 'is simultaneous with' and 'is later than' are called B-predicates or B-expressions. These are part of the language of the static view of time, as are the following B-sentences: 'A is earlier than B', 'F is later than March 1, 1970', 'E occurs on March 1, 1970' (Gale underlines verbs which are to be read as tenseless).

Gale has the following reason for calling the two sorts of temporal language "dynamic" and "static". Either we may attend to the recession of that which was future, through the present, into the past; or we may attend to the fixity of events in series generated by the relation 'earlier than'. The first is the dynamic view of time; the second is the static view of time.

Gale's general division of temporal language into two main sorts is, I will argue, illegitimately extended to statements and to theories of time. He tries to show that there are A- and B-statements corresponding to A- and B-sentences. He tries to show that there are two theories of time. Roughly A-Theorists are said to be proponents of the dynamic view; B-Theorists proponents of the static view. I will leave discussion of the two purported theories of time to the next section. In this section I will argue that Gale fails to distinguish two sorts of statement.

Gale defines an A-statement in the following way:

"(A)³ Any statement which is not necessarily true (false) is an A-statement if, and only if, it is made through the use of a sentence for which it is possible that it is now used to make a true (false) statement and some past or future use of it makes a false (true) statement, even if both statements refer to the same things and the same places" (p.48).

A change in the meanings of some of its constituent words may change the truth value of the statement made by a given sentence. A B-sentence which now expresses a true statement may one day express a false statement if some of the words in the sentence change their meaning. Since it is possible for any word to change in meaning, it is possible that the present use of any sentence makes a true (false) statement and the past or future use of it makes a false (true) statement. Gale's definition thus makes all statements A-statements.

Gale's criterion for a B-statement is, for the same reason, self-defeating:

"(B) Any statement is a B-statement if, and only if, it describes a temporal relation between events and is made through the use of a sentence for which it is the case that if it can now be used to make a true (false) statement then any past or future use of this sentence also makes a true (false) statement" (p.51).

Logical considerations cannot guarantee that some sentences now used to make true statements will also make true statements if used at some other time.

After outlining the B-predicate method of analysing A-expressions, I try to show that it is acceptable. I do this by comparing the descriptive or informative content of A- and B-sentences. Gale argues against the B-predicate analysis by arguing that A-statements contain facts which are not contained in B-statements. I put the matter in terms of a comparison of tensed and tenseless sentences rather than in terms of a comparison of A- and B-statements for two different reasons. First, Gale is unsuccessful in showing that there are two sorts of statements. Second, statements are the descriptive or informative content of declarative sentences. If we are trying to get clear about what can be stated in a certain sentence, then we still need to get clear about what statement it is that the sentence expresses. If we know what statement is expressed by a sentence, we know what the content of the sentence is.

The following is a very summary sketch of the structure of this thesis. In section 2, I try to show that Gale fails to establish that there are two theories of time. In section 3, I outline and

modify the Reichenbach-Goodman proposals to eliminate A-expressions. In section 4, I first counter Gale's claim that there are facts expressible only in tensed sentences. Then I discuss some of what is involved in comparing two systems of discourse with respect to their descriptive or informative capacity. In section 5, I try to show the descriptive adequacy of B-sentences. In section 6, I conclude by suggesting why it is that A-expressions even though not required to describe the world are nevertheless a fundamental part of our language of time.

2. OUTLINE OF THE A- AND B-THEORIES

Gale sets out the A- and B-Theories in terms of four pairs of rival tenets. The A-Theory tenets are these:

- "(1) The B-Series is reducible to the A-series since B-relations can be analysed in terms of A-determinations;
- (2) temporal becoming is intrinsic to all events;
- (3) there are important ontological differences between the past and the future; and
- (4) change requires the A-Series" (p.24).

Gale says the following "...constitute the B-Theory of time:

- (1) The A-Series is reducible to the B-Series since A-determinations can be analysed in terms of B-relations between events;
- (2) temporal becoming is psychological since A-determinations involve a B-relation to the perceiver;
- (3) the B-Series is objective, all events being equally real; and
- (4) change is analysable solely in terms of B-relations between qualitatively different states of a single thing" (p.16)

(Below, tenet (1) of the A-Theory is numbered (A1), tenet (1) of the B-Theory (B1), and so on).

The original problem is that of relating two radically different ways of conceiving or talking about time (cf.p.7). Gale takes (A1) and (B1) as having the most direct bearing on this problem.

The relations "...is reducible to..." and "...is analysable in terms of ..." can be taken as necessarily asymmetric. Gale sometimes appears to use them this way (on p.25 and p.53 he refers to(A1) and (B1) as contraries). Chapter IV is to show that (B1) is false; Chapter VI is to show that (A1) is true. If there is contrariety between (A1) and (B1), Chapter IV argues for a weak thesis to be superseded later on; for the proof of a claim is a fortiori the disproof of its contrary. Gale does not consider Chapter IV redundant on Chapter VI because he sometimes adopts a view of the relations in (A1) and (B1) as contingently asymmetric.

One could (and in Chapter IV Gale does) read "...is reducible to..." as "we have a method of reducing ...to...". In discussing the ineliminability of A-determinations, Gale argues that no proposed method of A to B reduction works.

Whether analysis and reduction are taken as necessarily asymmetric or not, Gale's general program becomes puzzling. If (A1) and (B1) are contraries, then Chapter VI, if correct, strengthens the conclusion of Chapter IV (viz. that no proposed method of A-sentence elimination works) by showing that B-sentences are analyzable in terms of A-sentences, and that there could therefore be no method of A-sentence elimination. If they are not logical contraries, Gale is wrong in viewing the two theories as competitive. The first alternative points out the need for an account of analysis and reduction which demonstrates their asymmetry and thereby supports the view that the theories are competitive. The second questions the assumption that we have two rival theories of time. In section 4 and following I will say more about analysis and reduction. The doubt that we have two rival theories of time will receive immediate support; first by looking at Gale's general program, then by looking at the remaining pairs of tenets.

Gale sometimes discusses two kinds of temporal expressions and sometimes discusses two theories of time. We could, if we have two different sets of temporal expressions, have two different theories: each explaining how we can, using one set, talk about time. If the A-Theory is an attempt to describe our thought and talk about time insofar as we employ A-expressions (and similarly for the B-Theory), then the theories are non-competitive. The question which is right ought rather to be whether either is right, and examination of each theory can at most be preliminary to answering how the two ways of thinking and talking about time relate.

A possibility more sympathetic to Gale is that the theories are programmatic; each one elaborating and extending the expressiveness of one kind of temporal language. By taking the theories as programs for reconstructing a set of temporal notions so that by using only one set we can say whatever we have to say about the temporal nature

of things, we move closer to a possible competitiveness. The controversy would then not be over which is right so much as over whether either works; or, if both work, over which system provides the greater simplicity, clarity, etc. of expression.

The actual situation is, I think, a mixture of these two ways of taking 'A-Theory' and 'B-Theory'. Those Gale cites as A-Theorists are fairly close to a descriptivist program; his B-Theorists to a program of reconstruction. Some textual support can be got from Gale. In Chapter VI where Gale argues for (A1) he mentions none of those he earlier (on p.24) lists as A-Theorists. Yet in Chapter IV which centers around (B1), several "B-Theorists" are mentioned and these in turn are indebted to other "B-Theorists" for proposed methods of A-to-B reduction. Insofar as those Gale cites as A-Theorists are descriptivists, they need not share his view that "...everything we say through the use of B-sentences could be said through the use of A-sentences" (p.59). But to argue that everything we say could be said in B-sentences, one must propose some method of eliminating tenses and A-determinations.

Gale does not say what kind of theories about temporal expressions the A-and-B theories are. This leaves open the question of what bearing a discussion of the two theories will have on the problem of relating the two sets of expressions. If we leave aside the task of relating the theories to the sets of expressions, there is still the problem of relating the theories to each other.

I have briefly discussed the difficulties arising over (A1) and (B1). The three remaining pairs of tenets are on the nature of temporal becoming, on whether there are ontological asymmetries between the past and the future, and on the temporal concepts presupposed by the concept of change. Gale discusses each pair separately and avoids the risk of rejecting a good point in a bad theory. Gale's itemized treatment carries an opposite risk. The theories are supposedly linked to two different ways of thinking and talking. Until we know how each important term or tenet functions within each theory, we cannot compare out of context a tenet of one theory with a tenet from another. Grammatically similar phrases may, in two different modes of speech, have very dissimilar meanings. Two tenets with the grammatical form of contraries may not make contrary claims. We should not expect to be able to avoid separate

examination of each theory as a pre-condition of useful comparisons between the two. Gale fails to discuss each theory separately, before comparing them. I will argue that if we look just at the B-theory, we can find no use for the second and third tenets.

If we have two ways of thinking and talking about time, Gale's effort to find pairs of rival tenets is misplaced. On the static view, we have no division between past and future and no obvious use for the expression 'temporal becoming'. I will contend that B2 and B3 serve only the function of making it all even at four a side. If we look just at the B-Theory by itself, we can see no reason whatever for a B-Theorist to assert either B2 or B3. If we look at the B-Theory as an effort to deny what the A-Theorist claims, we cannot construe B2 or B3 in a way which leaves them consistent with B1 and non-trivial.

B3 reads "the B-series is objective; all events being equally real". The second clause of B3 cannot be read literally as a claim that all events are equally real. The literal reading would commit the B-Theorist to the nonsensical permissiveness of treating fictional, possible and historical events as ontological equals.

It does not help to view B3 as an effort to deny A3 by claiming that the B-series is objective, all past, present and future events being equally real. Although this revised reading of B3, which treats the quantifier as implicitly temporal, seems to express a significant claim, it is not a claim which the B-Theorist can consistently make. 'Past', 'present' and 'future' are not expressions which find use in the B-Theory. Admittedly, the B-Theorist may use these words but he is committed by B1 to their eliminability in favour of B-relations. It seems we must read the quantifier of B3 as implicitly temporal, but this temporal reading must be expressible in B-relations.

Suppose we rewrite B3 as "...all events occurring in time are equally real". This rescues the B-Theorist from commitment to the reality of, for example, fictional events; but the save has difficult consequences for Gale's main program. If we have only B-expressions in which to explain 'occurring in time', we cannot simply say that an event occurs in time only if it is B-related to other events. Fictional events bear B-relations to other fictional events; the hero's rise is earlier than his downfall. Nor can 'occurrence in time' be paraphrased into

'having B-relations to (other) real events'. The identity of any B-series is given by the events which compose it. Any consistently describable sequence of events constitutes a B-series (of possible events). The uniqueness of the B-Series is given by the actuality of all its constituent events. What is special about one B-Series, what justifies calling it 'the B-Series', is that only that series is composed solely of real events and that all real events are members of that series. Consider a B-Series describing the youth, middle age and peaceful retirement of Caesar. In that B-Series, Caesar's tending of a rose garden is later than his chatting with Brutus on the evening of the Ides of March, BC 44; still later than his partitioning of Gaul, and so on. The possible continuants of any fragment of the B-Series will form continuations only if we B-relate these possible events to earlier (later) real events in saying that things might have gone (arisen) differently.

If the goal is to give the B-Theorist something to say by means of (B3), we can either continue to look for a B-expression paraphrase of 'occurring in time' or take up an alternative suggested by the paragraph just above. We can make (B3) true by making explicit the force of the definite article in 'the B-Series'. The two kinds of paraphrase yield something like the following:

- (i) The B-Series is objective, all events occurring in time being equally real; or
- (ii) The B-Series of all and only real events is objective, all member events being equally real.

Even if a B-expression paraphrase of 'occurring in time' is possible, it must be such that occurrence in time does not entail being real or (i) amounts to nothing more than a variant of (ii). The second paraphrase of (B3) makes it somewhat of a problem to see why anyone would oppose such a claim or why in its main tenets a theory must ward off such opposition.

To conclude my general dissatisfactions with Gale's approach to the problem of time, I will quote a comment of Prior's on the remaining two pairs of tenets:

"Gale (says) that all ordinary change 'presupposes' a totally different sort of change called 'becoming'. I must say that when I see this word in a book of this sort, I reach for the safety-catch of my revolver. Becoming is apparently something that is done by, or happens to, 'events'; and the assertion that it underlies all other change is hardly consistent with Gale's earlier and much more sensible observation that assignments of A-characteristics to events are just a 'notational convenience', 'The \emptyset -ing of S is present' being just a way of saying 'S is \emptyset -ing' (p.81). Why cannot he also say, that 'The \emptyset -ing of S, which is present will become past', just means 'S, which is \emptyset -ing, will come to have \emptyset 'd'?' (Prior's review of The Language of Time, in Mind, 1969, p.458).

I will not discuss the pairs of tenets on the nature of temporal becoming and on the temporal concepts presupposed by the concept of change. The first is an issue I do not understand. (B4) is, I think, contentious only if one thinks "Becoming is apparently something that is done by, or happens to, 'events';---that it underlies all other change"; and since I do not know what thinking that amounts to, I must regard as adequate the analysis of change "---solely in terms of B-relations between qualitatively different status of a single thing" (B4).

3. THE B-PREDICATE ANALYSIS OF A-EXPRESSIONS

In this section I will outline and then modify a method of eliminating A-expressions which is developed by Reichenbach in Elements of Symbolic Logic. Reichenbach develops a general account of token-reflexive words. He then supplements the general account to cover tenses.

"...there is a class of descriptions in which the individual referred to is the act of speaking. We have special words to indicate this reference. Such words are 'I', 'you', 'here', 'now', 'this'. Of the same sort are the tenses of verbs, since they determine time by reference to the time when the words are uttered...all these words can be defined in terms of the phrase 'this token'. The word 'I', for instance, means the same as 'the person who utters this token'; 'now' means the same as 'the time at which this token is uttered' " (p.284).

Reichenbach's general program is that of reducing sentences containing token-reflexive words to sentences containing only one token-reflexive expression, namely, 'this token'. On p.286, he points out that different tokens of the symbols 'I', 'now', etc. do not always make the same reference; and that the symbol 'this token' has tokens which in different utterances must have different referents. He calls the first psuedo-words, the second a psuedo-phrase.

The reference of the phrase 'this token' varies, but each occurrence of the phrase 'this token' has a sameness of function which justifies calling different occurrences of 'this token' tokens of the same type. Similarly, 'I' may have as many different referents as there are speakers; but we say that 'I' as said by each speaker is still the same word. Reichenbach's suggestive description is that "the symbol 'this token' is used to indicate an operation"; but, he continues, "the meaning of the operation cannot be formulated in the language itself but only in the metalanguage" (p.286). One would like to add "unfortunately"; because working backwards we make every sentence which is analysable only in terms of the operation indicated by 'this token' ultimately analysable only in a metalinguistic statement. If we were forced

to accept Reichenbach's move to the metalanguage to explain token-reflexives, we would have to leave his analysis subject to the following sort of criticism: "Whatever 'Today is Christmas' is about, it is surely not about an utterance of 'Today is Christmas' " (Prior, review of Gale, p.456). This is surely one of the few occasions in philosophy when 'surely' is justifiably used.

I will not discuss Reichenbach's general proposal to eliminate token-reflexives. The part of his proposal relevant to this thesis is that dealing with the elimination of tenses and the word 'now'. He says we are first to replace 'now' by 'the time at which this token is uttered'. We then are to replace 'the time at which this token is uttered' by 'the time at which theta is uttered' (Theta being the metalinguistic name of the sentence in question).

Gale credits Reichenbach with the following analysis of tenses: "...the A-statement, 'M is past (present, future)' can be analysed into the statement, 'M is earlier than (simultaneous with, later than) this token' " (p.18). He says, "By a token Reichenbach means an individual sign, for example ink marks on a certain piece of paper or the occurrence of a certain pattern of noises on some occasion" (p.18). The pattern of ink marks could have considerable temporal duration; but if a teller writes one's bank balance on a slip of paper, she does not mean by 'you have now ... in your account' that 'your having ... in your account is simultaneous with the enduring presence of these marks'. The tokens for a plausible token-reflexive theory, so stated, would have to be the act-tokens which have A-sentences as their products. However even by modifying the analysis to read 'M is earlier than (simultaneous with, later than) the production of this token' (which does allow 'token' to refer to, e.g., a certain pattern of ink marks), we are left with an overly simplified account of Reichenbach's proposals.

Reichenbach argues explicitly against the analysis even as modified above. He does so giving the following reasons.

"Let us call the time point of the token the point of speech. Then the three indications, 'before the point of speech', 'simultaneous with the point of speech', and 'after the point of speech', furnish only three tenses; since the number of verb tenses is obviously greater, we need a more complex interpretation. From a sentence like 'Peter had gone' we see that the time order expressed in the tense does not concern one event, but two events, whose positions are determined with respect to the point of speech. We shall call these time points the point of the event and the point of reference" (p.288).

Reichenbach abbreviates the three points as S, E, R; he uses commas to indicate coincidence and hyphens to indicate temporal succession. He defines nine fundamental tenses, e.g. E-R-S for simple present.

Even by having nine tenses Reichenbach's system is, Prior says, too simple. In Past, Present and Future Prior argues "...we can easily construct more complicated tenses than the future perfect, e.g. 'I shall have been going to see John'. Here there are in effect two points of reference, which might be (though there are other possibilities) as in the following representation: S-R₂-E-R₁" (p.13).

In Past, Present and Future, Prior comments "Reichenbach's scheme, however, will not do as it stands; it is at once too simple and too complicated" (p.13). The preceding paragraph gave his reason for thinking the scheme too simple, i.e. we can generate tenses other than the nine provided for. Prior is not explicit about what it is in the scheme that makes it in his view too complicated, but he complains against Reichenbach's sharp distinction between point of speech and point of reference. He says that the point of speech is just the first point of reference.

Reichenbach's general goal is to replace tensed sentences with tenseless ones. I will contend that that can be accomplished without adding to the three indications, 'before the point of speech', 'simultaneous with the point of speech', and 'after the point of speech'.

Consider the Reichenbach analysis of (i) 'N.N. had seen John'. This is to be analysed as (ii) 'N.N. sees John at some time earlier than R which is earlier than the production of this token'. Any event significantly earlier than an utterance-act is also earlier than some other time which is earlier than the utterance act and later than the event. There is point in making reference to a time between E and S only if this third time, R, has been previously referred to. If we are told that N.N. had seen John it makes sense to ask when he had seen him; and since, if we ask this, "At some time earlier than a time earlier than the production of this token" won't do as an answer, 'R', in (ii) cannot simply refer indefinitely to any time between N.N.'s seeing John and the production of 'N.N. had seen John'. If the context does not make it clear what point of time is referred to by 'R', the past perfect 'N.N. had seen John' carries only the force of the simple past 'N.N. saw John'.

If the context makes it clear what point of time is referred to by 'R', e.g. in 'N.N. had seen John before the start of the meeting', then only the indication 'before the point of speech' is required in the analysis. The sentence can be paraphrased in the following way: 'N.N. sees John before the start of the meeting, and the start of the meeting is earlier than the production of this token'.

Similarly future perfects, e.g. 'N.N. shall have seen John' either hold only the force of simple future tenses or are completable from contextual information by some additional phrase such as '...before the start of the meeting'. Thus completed the future perfect can be paraphrased into 'N.N. sees John before the start of the meeting, and N.N.'s seeing John is later than the production of this token.'

Reichenbach's more complex system based on 'point of time', 'point of speech' and 'point of reference' allows for differentiations which cannot readily be made using only 'earlier than the production of this token', 'simultaneous with the production of this token' and

'later than the production of this token'. He provides differing schema for the simple past and the present perfect. Thus 'I saw John' is represented as R,E-S and 'I have seen John' as E-S,R. Both could be rendered as 'My seeing John is earlier than the production of this token'. Reichenbach's different schemas suggest that in the one case the event is viewed from a point of reference in the past, while in the other case it is viewed from a present reference point. This difference could be preserved in those cases wherein it is possible to demonstrate that the simple past is preferable to the present perfect. For example, if asked who he saw at the meeting, N.N. might reply, "I saw John" rather than "I have seen John"; for in this case the point of reference is clearly the time of the meeting. In reply to the question, N.N.'s answer has the force of 'My seeing John is earlier than the production of this token and simultaneous with the event of the meeting'.

It has been established that Reichenbach's proposal is too complicated in its treatment of at least some tenses. Although it would require detailed treatment of each tense to show that no more than the three temporal, relational predicates completed by '...the production of this token' are required to analyse all tenses, I contend that this is so.

Reichenbach's general program of analysis is designed to replace all contextually dependent sentences with freely repeatable ones, that is, with sentences whose truth-value does not depend on the time or place of utterance or the identity of the speaker. His method is to eliminate first all token-reflexives except 'this token' and then to eliminate that by a definite description (in the metalanguage) of the sentence in the object language. The goal of free repeatability can be reached more quickly.

Consider first a simple case of eliminating a token-reflexive word, such as 'here'. We can, following Reichenbach, replace 'here' by 'the place where this token is uttered' and in turn replace that by 'the place where theta is uttered' (where theta is a metalinguistic name of a sentence in the object language). A much less cumbersome way is given by Goodman "...we may seek a translation

that contains...another name for what the indicator names. Thus a certain 'here' is translated by any 'Philadelphia'; and a certain 'ran' is translated by any 'runs on Jan. 7, 1948 at noon E.S.T.' " (The Structure of Appearance, p. 369).

The justification for each step in the Reichenbach analysis is that each substitution for a token reflexive makes just the same reference. The final outcome of the Reichenbach proposal is that he adopts a metalinguistic description; and if he is right in taking tenses and the words 'I', 'now' and 'here' as "referring to the act of speaking", his analysis retains something of the structure of the original sentence which is lost in the Goodman analysis. A certain 'here' refers to a place referred to by both 'the place where theta is uttered (where theta names the utterance in which the 'here' in question occurs)' and 'in British Columbia'. If we ignore referentially opaque contexts, any of the three are interchangeable without change in truth-value because the references remain constant. Ordinarily we must know where an utterance was made if we are to know what is referred to by a 'here' contained in it. This structural similarity is preserved in the Reichenbach outcome by making the identification of a place referred to dependent on the identification of the place where a 'here' was uttered. But the Goodman outcome is acceptable if the Reichenbach outcome is, since the justification for either is that referential expressions are intersubstitutable if extensional equivalence is preserved.

Goodman need not say that "a certain 'ran' is translated by any 'runs on Jan. 7, 1948 at noon E.S.T. ' ". Borrowing from Reichenbach he can first say that a certain 'ran' is translated by any 'runs earlier than theta' (where 'theta' is the metalinguistic name of the utterance in which the certain 'ran' occurs). He can then say that, since what justifies Reichenbach's translation is that the temporal references are kept constant, the following translation is equally acceptable 'runs earlier than t (where t is the time and date of the utterance of theta)'. The resultant paraphrase is not metalinguistic; and, if the token-reflexive analysis is correct, we can simply replace tensed utterances by tenseless ones containing time-and-date predicates. We need not involve the metalanguage at all.

4. PRELIMINARIES TO THE DEFENSE OF THE B-PREDICATE ANALYSIS

In this section I will begin by countering Gale's attempt to prove that A-expressions are ineliminable. The argument against Gale's claim will be pressed on a general level to show not only that Gale is wrong but that the comparison of two systems of discourse cannot be carried out in the way Gale tries to compare tensed and tenseless languages.

On pp. 55-64 Gale wants "...to drive home the fact that A-expressions are ineliminable because they do convey some kind of factual information" (p.56). Presumably Gale means that they are ineliminable because they convey some kind of factual information which cannot be conveyed by B-expressions. His arguments are based on examples such as an imagined case of an army scout giving reports on the enemy's approach. His example is to show that (i) gives information which is not given by (ii):

- (i) 'The enemy is now within 100 yards'.
- (ii) 'The enemy is within 100 yards on December 12, 1966, at 4:01 p.m. E.S.T.' (Here as before underlined verbs are to be read as tenseless)

He argues that (ii) "...does not convey information about the A-determination of the reported event" (p.59). He admits that one could from sentences like (ii) find out by non-logical means where the enemy now is. That is, one could hear and understand (ii), then, for example, check a calendar watch, and find out where the enemy now is. Gale does not precisely distinguish between logical and non-logical means of discovery; but he means by 'non-logical discovery' learning something by doing more than simply understanding an utterance. Gale claims that whenever someone who has understood an utterance, S, still requires non-logical means of discovery to learn that p, then p is not part of the descriptive or informative content of S. Given this principle of what is to count as part of a statement's content we can apply it to (i) as well as to (ii).

Audible utterances are sufficiently immediate and impermanent that a hearer (almost always) knows the time at which the utterance occurs. If the utterance product is a noise, the utterance process

and product are (practically) simultaneous. Utterance products employing present or future tenses can be proved to convey ineliminable information about presentness or futurity only if these products could not have transcribable equivalents. Gale argues that if the scout makes his report by uttering (ii) the commander must still employ non-logical means (e.g. check a watch) to find out where the enemy now is. If the scout makes the same assertion whether he writes or says (i), then because the commander, given a written (i), still must employ non-logical means (e.g. ask when the note was written) to find out where the enemy now is, neither a voiced nor written (i) conveys information about the presentness of any event.

For both (i) and (ii) the commander must know where the scout is if he is to know where the enemy is 100 yards distant. Consider (iii) "The enemy now is within 100 yards of here". In saying (iii) the scout would not be saying where he is. Such uses of 'here' do enable the commander to learn, by drawing on his knowledge of where the scout is, where it is that the enemy is 100 yards distant. 'Here' in (iii) conveys some information about spatiality; even if the commander has false beliefs about where the scout is stationed, he should learn from the message that the enemy is 100 yards from the scout. 'Here' and 'now' both convey speaker-relative information about what is present, but unless the hearer knows where or when the utterance is made, he does not learn from (i) or (iii) more than that the enemy is temporally or spatially near the speaker at the time of speech. (i) and (iii) do not state locations of the enemy in the strong sense of saying where the enemy is relative to the 'hearer', i.e. the recipient of the message or to an established framework of spatial or temporal reference points.

Gale's seemingly plausible criterion of informative content fails to mark off what is from what is not part of a statement's content.

Gale says "...the statement Joe [the scout] makes [in uttering (ii)] ...does not convey information about the A-determination of the reported event, nor does it entail a statement that conveys such information. If it did it would not be necessary for the company commander to [check]...his calendar-watch to find out if the dated event has the A-determination of presentness" (p.59).

(iii) conveys information about the enemy's location i.e. enables the commander to find out where they are if he either knows or can find out where the scout was when he reported in. But if he already knows on hearing (iii) where the scout is then it is by logical means that he finds out where the enemy is; but if he still must find out where the scout is then he must do so by non-logical means, and hence it is by non-logical means that he learns where the enemy is. But then equally the commander need not necessarily check his watch, i.e. employ non-logical means; he may just have done so before he heard (ii) and then simply go on what he knows, i.e. draw the inference. The same applies to (i). If the commander knows that the utterance he is hearing is (practically) simultaneously being produced, he may learn from (i) that the enemy is now 100 yards away. If he doesn't know that (whether) his hearing of the utterance is (practically) simultaneous with the scout's making of the utterance, he must employ non-logical means to find that out.

Gale argues:

"...if a statement conveys an item of information alpha, which then makes it possible for the hearer to discover on his own through non-logical means an additional item of information beta, then this statement has not conveyed item of information beta: beta is not part of the factual or informative content or, in other words, not part of the statement made" (p.59).

There are two errors in the attempt to say what is part of a statement's content and what is not by saying what a hearer can find out by logical means and what he cannot. In the pages above, I have shown that the split between what can be found out by logical means and what cannot varies with the amount of relevant knowledge the hearer has or lacks.

There is a second error in Gale's attempt. This arises when one tries to give criteria for what is to count (and for what is not to count) as part of a statement's content in terms of what the hearer of the statement can discover by logical means and what he must employ non-logical means to discover. If we already know what statement it is from which the hearer learns alpha directly and beta indirectly, we do not need a further account of what the statement's content is: statements just are the content of descriptive or fact-stating sentences. Gale cannot plead that he is using 'statement'

in a broad sense which includes sentences because he uses the sentence/statement distinction throughout, particularly in Chapter III.

The use of the phrase 'the statement that roses are red' presupposes that there is something which speakers do (or would) mean in using tokens of the type 'Roses are red'. We could not talk about the statement that roses are red unless the sentence 'Roses are red' is (would) usually be used to convey the same information. Our successful use of definite descriptions of the form 'the statement that ...' depends on our knowing what statement it is that we are referring to. We can know this only by knowing what the sentences which follow the 'that' mean. Talking about statements is a way of talking about the informative content of declarative or fact-stating sentences. If we are trying to prove that this-or-that is (or is not) part of the content of a sentence, we beg the question if we begin by talking about the statement the sentence expresses.

Gale's attempt to show the ineliminability of A-sentences can be faulted on more general grounds. In "Particular Reidentification", Dretske offers some remarks on the comparison of two systems of discourse with respect to their descriptive capacity. These remarks are largely self-contained, and my discussion of them reflects no view on the rest of the paper from which they are taken.

"On the one hand, in talking about our conceptual scheme one may be thinking of the particular conceptual apparatus involved, those elements, procedures, and categories which are, as a matter of common usage, employed or presupposed in everyday communication" (p.134).

Tenses and A-expressions are unquestionably fundamental to our conceptual scheme in this sense. Almost all sentences contain at least one such device.

Dretske's second sense of the phrase is as follows:

"The conceptual scheme refers to the type of thing that can meaningfully be said in a given system of discourse, or, if you please, language game - not how, in terms of specific conceptual apparatus, it is said. Two such schemes are identical, qua conceptual schemes, if what can be said in the one can also be said in the other and vice versa. They are different, for example, not if one uses tensed predication where the other uses none, but only if the use of this mode of predication alters the descriptive capacity of one system in contrast to the other" (p.135).

Dretske's criterion of conceptual scheme identity, in the second sense of 'conceptual scheme' is first stated in terms of what can be said in one or another system. The explicit contrast is to how something is said. Dretske adds 'descriptive capacity' as an alternative way of expressing the first half of the distinction between what can be said and how it can be said.

It seems intuitively plausible that there is a form/content distinction like the one relied on in the definitions. Whether it is adequate for Dretske's purposes is not presently at issue. Gale, however, requires just such a distinction to argue that there are facts which are expressible only in tensed sentences. If there are facts expressible in a system of discourse, their denials are also expressible. Gale's claim that there are facts which can only be stated in tensed sentences can be expanded harmlessly by dropping the restriction to facts - i.e. to things which can truly be stated. Gale can be read simply as claiming that there are things which can be stated (whether truly or falsely) in tensed sentences. Thus expanded Gale's claim rests on a criterion of conceptual scheme identity exactly like Dretske's second one.

If we wonder what certain sentences and classes of sentences mean, we are no nearer an answer if we instead ask: "What facts do these devices enable us to state?" Strawson, in the second section of "Truth" (Proceedings of the Aristotelian Society, Supp. Vol. XXIV, 1950), argues that facts are not the non-linguistic correlates required by a correspondence theory of truth. Their linguistic status, their being what can be truly stated, binds any specification of facts to the meanings of sentences in the following way. If we set out to compile a list of known facts (or, to make the task more definite, a list of facts known by A at t), what we shall do is put down a list of sentences. Before adding any item we can determine whether it is required or superfluous only if we can determine whether some previous sentence states the same thing.

Arbitrary criteria for specifying fact-identity just create new problems elsewhere. We could for example adopt the following ruling: 'A knows that p if, and only if, A knows that q' entails 'p is logically equivalent to q'. If someone can know that Victoria is smaller than Vancouver without knowing that Vancouver is larger than Victoria, we then have two distinct facts, not one

fact expressed in two different ways. The problem, however, now becomes one of saying whether someone can know the one without knowing the other or whether his ignorance of the one counts decisively against our crediting him with knowledge of the other. If the sentences 'Victoria is smaller than Vancouver' and 'Vancouver is larger than Victoria' both mean the same thing, then to know that Victoria is smaller than Vancouver is to know that Vancouver is larger than Victoria. We must determine whether these two sentences constitute two ways of saying the same thing or whether they express two different facts. The arbitrary rule for fact-identity itself can be applied only if we can determine which sentences are synonymous and which are not.

Arguments from a single example are not adequate however to prove the general claim that problems about fact-identity are problems about sentence meanings. The more general proof can be got by re-examining Dretske's remarks. The comparison of different conceptual schemes is a possibility required by the second definition. We are to determine of two systems of discourse whether both have the same descriptive capacity. That is, we are to check two systems of discourse to determine whether they form identical conceptual schemes by seeing whether all the facts expressible in either one are expressible in the other. If we have two systems of discourse rather than, say, two arbitrarily specified sets of words and syntactical structures, indefinitely many sentences can be generated within each system. To know that a certain fact is not expressible in a system, we must know both that certain sentences cannot be generated and that, of those which can be generated, none can mean ----(where the blank is filled by the fact in question). The first requirement might be met by some device analogous to a consistency proof, which would show that the fact as stated lacks properties possessed by the kernel sentences and preserved by the generative rules. The second requirement for knowledge of what each of indefinitely many sentences means cannot be met. Even if the fact as stated is provably excluded from the system of discourse, some included utterance could express the same fact in a different form.

Even if we limit the systems to be compared so that we can exhaustively specify the distinct linguistic forms possible in each, we have always the further problem of saying what each distinct form

means. Consider that the comparison of the two systems of discourse must be conducted in some one system: in either of the two in question, or in some third. In whatever system we make a list of the expressible facts, we must produce sentences synonymous with those in the two systems.

It is a contingent fact that a given sentence means what it does; and it is an empirical question whether two sentences are alike or different in meaning. In Word and Object, Quine argues that translation is under-determined,

"...rival systems of analytical hypotheses can fit the totality of speech behaviour to perfection, and can fit the totality of dispositions to speech behaviour as well, and still specify mutually incompatible translations of countless sentences insusceptible of independent control" (p.72).

Quine also points out that theoretical obstacles to translation are not always obstacles in practise.

"The predicament of the indeterminacy of translation has little bearing on observation sentences. The equating of an observation sentence of our language is mostly a matter of empirical generalization; it is a matter of identity between the range of stimulations that would prompt assent to the one sentence and the range of stimulations that would prompt assent to the other" ("Epistemology Naturalized", in Ontological Relativity and Other Essays, p.89).

The difficulties which create indeterminacy are minimal with respect to observation sentences (cf. Word and Object, #10), and it is with observation sentences that the empirical task of radical translation begins.

By virtue of their free-repeatability tenseless sentences cannot be directly correlated with stimulus situations. One may be prompted by observation to assent (or dissent) to a tenseless sentence, but

"...these standing sentences contrast with occasion sentences in that the subject may repeat his old assent or dissent unprompted by current stimulation when we ask him again on later occasions, whereas an occasion sentence commands assent or dissent only as prompted all over again by current stimulation. Standing sentences grade off toward occasion sentences as the interval between possible repromptings diminishes; and the occasion sentence is the extreme case where that interval is less than the modulus" (i.e. the length of sensory irradiation chosen in the empirical determination of stimulus meaning, cf. pp.31ff.) (Word and Object, p.36).

Past and future tense sentences are low in degree of dependence on particular observation. Our assent or dissent is not correlated to just our present sensory intake. Observation sentences are necessarily present tensed, though the converse does not hold; there are no observation sentences lacking both present tensing and an (implicit) A-determination like 'now' or 'at present', though there are sentences containing both which do not report, hence do not report observations. Quine's example sentence 'Rabbit' seems an exception; but, for the interval between possible repromptings to diminish to less than the modulus, 'Rabbit' must be elliptical for 'Rabbit, now'.

The reduction of tensed to tenseless sentences cannot be (in-) validated by showing the (non-) synonymy of single pairs of A- and B-sentences. All but the present-tensed sentences are remote from the sensory periphery, i.e. from the close correspondence observation sentences have to particular sensory stimulations. Where the degree of dependence on observation is low there is greater latitude in distributing empirical content. Quine claims "...meaning, once we get beyond observation sentences, ceases in general to have clear applicability to single sentences" ("Epistemology Naturalized", p.89). He argues 'Just as we may meaningfully speak of the truth of a sentence only within the terms of some theory or conceptual scheme, so on the whole we may meaningfully speak of interlinguistic synonymy only within the terms of some system of analytical hypotheses' (Word and Object p.75).

Earlier in this section, I have argued that we cannot demonstrate that a particular fact is inexpressible in a system of discourse because to do so would require showing that none of the infinitude of sentences which can be generated within the system expresses the fact in question. The form/content distinction cannot be used to determine whether two systems of discourse constitute identical conceptual schemes, in Dretske's second sense. To say what the content of a given sentence is we must be able to say what the sentence means. We cannot test two sentences for synonymy by first seeing whether they express the same facts; for what determines what facts a sentence expresses is just what the sentence means. The B-predicate analysis cannot be defeated on the grounds that there are some facts expressible only in tensed sentences.

However the indeterminacy-of-translation-thesis poses a problem for supporters of the B-predicate analysis. If we can meaningfully speak of synonymy only within the terms of a system of analytical hypotheses, we cannot take a tensed and a tenseless sentence in isolation and argue that they are synonymous. Particularly in the case of standing sentences, rival hypotheses, equally supported by the relevant empirical data concerning people's linguistic dispositions and behaviour, could, if Quine is right, give conflicting rulings on whether two sentences are or are not synonymous, on whether they do or do not convey the same facts.

Gale's claim is that there are some facts expressible only in tensed sentences. I want to argue for the contradictory of this without comparing example pairs of tensed sentences and those tenseless sentences linked to them by the B-predicate analysis. Insofar as we can categorize sentences as fact-stating, assertoric or descriptive, it seems sensible to ask what devices are required in such sentences if we are to have the means to describe the world adequately. I shall argue that tenseless sentences are in this sense adequate. I won't argue this from individual examples, but by arguing that a tensed history of the world can be uncontentiously reduced to a history which with the exception of one sentence is tenseless. I will then argue that this lone tensed sentence has no empirical significance, i.e., that it states no fact.

As a final preliminary to my argument for the acceptability of the B-predicate analysis, I will consider and refute a quite general objection to logical reductions as such. My argument to come in the next section is, I believe, a defense of a specific instance of what Wittgenstein is objecting to in his remarks on logic in the Philosophical Investigations.

His remarks on logic are directed against viewing logic as the essence of language. The point is reiterated in metaphors. Logic is said to force on us a picture of ideal rigor, of the depth of language, or of a metaphysical substratum underlying language. This can be glossed as a warning against treating the first artificial language we develop as a necessarily correct model of language. The tone of Wittgenstein's remarks on logic suggests his point is not this mild one; but I doubt that there is any other substantive point in his remarks on this topic. What he says against logic as a model of language seems to me required in defense of logic as a model of language.

In the Investigations he deals at some length with the disparities between ordinary language and formal logic. On the one hand, we have the sentences of ordinary language lacking the crystalline purity of logic; on the other, we have rigorously defined sets of symbols. Logic cannot model language in all respects. There are two sorts of reasons for this. There are first the Wittgensteinian objections against the possibility of exactly specifying what is said in an utterance which is not rigorously governed by rules of the sort used in formal systems. However, if logic did model all the features, logic would cease to be a model of language. Something must be lost in a logical reduction or the reduction fails to simplify. Because the form/content distinction cannot be drawn rigorously for natural languages, we require artificial languages for which it can be. If the ordinary uses of 'and', 'or', 'if...then' and 'not' were as obviously governed by rules as simple as those governing ampersand, tilde, etc., we would have no need of systems demonstrating the behaviour of connectives. Language itself would be as transparently rigorous as logic; its formal properties as obvious as those of a calculus.

5. THE DESCRIPTIVE ADEQUACY OF B-SENTENCES

It cannot be required of the B-predicate analysis that it preserve all the features of tensed sentences. What must be preserved is the factual or descriptive content of tensed sentences. I will begin arguing for the descriptive adequacy of B-sentences by considering tensed sentences of the following sort.

- (i) 'It is now 3 o'clock'.
- (ii) 'Today is the 15th'.
- (iii) 'Today is Christmas'.

These sentences have the following feature in common: each correlates a time referred to by an A-expression with a time referred to by a B-expression. Many other sentences could be cited which share this feature, e.g., 'The day before yesterday was Friday'. I will call all such sentences correlating-sentences.

If we eliminate the A-expressions from correlating-sentences, the resulting B-sentence is either a tautology or a self-contradiction. Correlating-sentences seem to be genuinely informative in a way in which, for example, 'The 15th is the 15th' is not. Yet if we are to replace 'today' in (ii) by 'the day on which this token is uttered' and to replace 'the day on which this token is uttered' by a B-expression referring to the same time, then it seems that either the informativeness of (ii) is illusory or the B-predicate analysis is false.

So long as we employ more than one series of temporal expressions whose members refer to the same units of time, correlations of the two series will in general be informative in some sense. For example, if we employ both the recursive series of days of the week and the linear series of days of the month and year, it will be in some sense informative to say that March 1, 1970 is a Sunday. Given any such correlation between two series whose members apply to similar temporal units, e.g. days, all additional identity judgments between members of the two series are calculable. Still it could be informative to someone to be told that March 1 of the following year is a Monday even if one already knows that March 1 of this year is a Sunday. We do not need to be told that the first is a Monday and that the second is a Tuesday and that the third is a Wednesday. If

we were sufficiently adept at arithmetic, we should find it virtually as boring to be told both that May 3, 1970 is a Sunday and that July 9, 1971 is a Friday. It is completely arbitrary how we initially choose to correlate the day-of-the-week series and the days-of-the-month-and-year series. Further correlations are not arbitrary if we are to preserve the possibility of basing the application of both series on the same phenomena, e.g. the regular day-night alterations. The B-predicate paraphrases of correlating sentences are in no sense informative, being all of the form 't is t' or 't is not t'. The seeming informativeness of 'Today is Saturday' is of the same sort involved in judgments such as 'March 1, 1970 is a Saturday', 'The Roman numeral for five is V' or 'One inch equals 2.54 cm.'

The acceptability of the B-predicate analysis of correlating-sentences is dependent on the acceptability of the analysis of tensed sentences of other sorts. Consider an analogous case. Sentences which express the equivalences which hold between the British and metric systems of measurement have an informativeness lacking in such sentences as 'One inch equals one inch'. Yet, if we were to do all our measuring in the metric system, we would require no correlations of that system to any other. If we now invent a new system of measurement, we say nothing new about the world when we say how the units of the new system are to be correlated to traditional units of measurement. If the notions of precedence, simultaneity and subsequence alone suffice to describe the world, we are told nothing further about the world if we are told how it could be redescribed using other temporal notions. The informativeness of 'Today is Saturday' is not such that if a system of discourse cannot express that information it is inadequate to describe the world.

To defend the B-predicate reduction of tensed sentences other than correlating-sentences, I will discuss a case of someone who has access to empirical information stated both in A-sentences and in B-sentences.

Sometimes maps are posted and marked with an arrow reading 'You are here.' All the place names on the map could also be marked '...is here'. 'You', however, functions in a very different way from 'Oak Street'; on Reichenbach's analysis the word 'you' on the map refers in any instance of being read to whoever reads it. A rough distinction can be made between two senses in which a map such as this enables us to locate objects. Even without the arrow one can locate₁ any mapped object by relating it to all the other mapped objects. One knows how to get to Oak from any other place on the map if one can locate₁ both places relative to each other. Actually knowing how to get to Oak requires locating₂ Oak with respect to oneself. Hence the point on the arrow.

Consider that we could map persons just as we do streets if our mapping technique allowed for rapid changes in spatial location. Suppose we produce a film, each frame being a map of an area at some time. With regular temporal intervals between frames, a long enough film would record any segment of the spatio-temporal history of an area. We have then two sorts of map. The first is simply an abstract from the second of detail which remains fairly much unchanged from frame to frame.

The arrow on a fixed map enables us to locate₂ the objects represented. Location₂ can be made possible in other ways, e.g. by posted names in the area corresponding to names on the map. We can also locate₂ mapped objects if we can recognize parts of the area as parts represented by certain asymmetric and unique parts of the map. Seeing a right-angled intersection will not by itself enable us to know which, of several shown on the map, this is. Nor would it be enough if only one such intersection were shown to find one; for we should still require asymmetric detail to determine which orientation to give the map.

Location of objects from a single map-slide or a fixed map can be explained simply as location of the objects shown with reference to oneself. In considering the second sort of map, we must decide on a more explicit sense of location₂. We could use the rough definition of location₂ above to justify claiming that anyone who can locate all the objects shown on a film map which in part records his whereabouts need only know how he is represented on the map to be able to locate₂ everything else. If the map-slide for some time,

t_x , shows the viewer, he can say, for example, "At t_x Oak is the next street west of me".

One wants to say that there must be a stronger sense of location₂ Unknown to us, cartographers might produce slides mapping the subsequent location of things. We might be astonished that our movements on any given day were correctly forecast beforehand; but arguably the possibility is open. Location with respect to oneself, location₂ admits of a stronger construal than that exemplified by "At t_x Oak is the next street west of me". For any point in time there could, granting the predictability of human movements, be a corresponding map-slide showing where anyone and anything is at that time. A viewer has a special interest in knowing which map-slide shows the present location of things.

We could, still granting predictability, have a map-film covering a time period which begins before someone's birth and continues after his death. If he watches the entire film, he can learn where he is at any time. Times can be identifiable by him if the film contains an identifiable slide which can serve as a chronological reference point. If he wonders what his location is at any time specifiable by a definite description based entirely on film data, the answer is obtainable from the data itself. He might note, for example, that only once are things arranged thus-and-so; and he could then ask not only 'Where am I when that array occurs?' but also 'Where am I x intervals before (or after) that occurs?'. By hypothesis, his location is mapped at every chosen point of time throughout his life, so the data answers any question of the form 'Where am I at t_x ?' if, and only if, some frame can be individuated and used to identify times. Yet the viewer, though in possession of all the data, might still want to ask, 'Where am I now?'.

It is the possibility of this puzzlement which suggests a stronger sense of location₂. The stronger sense is required since, for a thus-puzzled viewer, there is no effective difference between location₁ and location₂. For him, even if he accepts the data as including his own history, all the locations are within a system in which he cannot, in some sense, place himself. What must be explained is how the puzzlement can arise, how someone can recall and accept an account as giving his life-long whereabouts and yet wonder where he is.

The puzzlement is dissolved if the viewer remembers observing some situation which the data shows is unique and if he remembers how long ago this situation occurred. But equally, if he cannot remember something which the data shows is unique; or if he can, but does not know how long ago that occurred, he does not know where he now is. Consider the more ordinary case of not knowing where one is, which can be brought about by inattention to one's surroundings. If one daydreams on a bus and suddenly becomes aware of the unfamiliarity of his surroundings, he may wonder where he is. In the ordinary case, as in the imaginary one, the person has a stock of unsatisfactory answers. In the earlier case, the answers are all of a tenseless sort. In the present case, they are all tensed: 'I am here', 'I am to the left of that', 'next to a large park', etc'.

In the first case, one can supply answers to 'Where am I?' simply by consulting the data which, by including his complete history, includes all the empirical data on his whereabouts. In the second case, simply by perceiving, one can supply indefinitely many answers of a tensed, demonstrative and token-reflexive form.

For a robust sense of 'knowing where one is', it must be possible to correlate data which is present tensed with data which is not. With a continuous chronological series which includes the present moment, both past and future tensed data can be given, without loss of descriptive content, in tenseless form. For, if it is possible to identify some member of the series as present, all earlier (later) members will be identified as past (future) by implication. The contrast between data which is present tensed and data which is not can in this instance be represented equally by the contrast between present tensed and tenseless data. I will say more on this point later. This is not to allow that it is sufficient for the possibility of location₂ to have information in terms of both what is the case and what is sensorily accessible. The daydreamer might also have access to the film history. He could perhaps recall the entire history and observe much of his surroundings, and yet reasonably wonder where he is. He can see that he is near a park, on a large street, etc., and recall that at t_x he is at S_1 , at t_2 at S_2 , etc., and yet be lost if unable to recognize some object in the vicinity as identical with some object

represented in the film-history. Roughly, data in a present tensed form does not enable him to place himself in an abiding spatio-temporal framework; and tenseless data does not enable him to place himself in such a framework.

The imaginary case must be made to correspond more closely to our actual situation if it is to show how the descriptive capacities of tensed and tenseless languages are actually related. To defend the B-predicate analysis, one feature of the imaginary case must be retained. It is essential to location₂ that we have the same content both in tensed and tenseless language. The analysis is acceptable if it can be shown that it is essential to our use of temporal expressions that the empirical content of tensed sentences can be reduplicated in tenseless sentences.

The map example can be modified to cover whatever data we wish. Just as a certain pale blue can, with appropriate conventions, represent water of six fathoms; so colours, shapes and whatnot could represent whatever we wish. There is nothing but practicality limiting the richness of detail on a film-map. We admittedly could not show everything, but there is nothing that could not be shown. We could, without significant change, drop the notion of having a map and use the philosophically more familiar notion of state-descriptions. A film-frame is simply the graphic representation of the state of affairs at any one time. Each state-description is the tenselsss account of how things are at some moment of time. I will refer to chronologically ordered series of state-descriptions as histories.

Problems arise if, as in the earlier case, we expand the history both to include data of any degree of specificity and to extend over any period of time. If we are to suppose there could be historians of what is future as there are of what is past, something must be said about future contingencies. If some propositions are indeterminate because they describe the future, it is implausible to suppose that historians could predice the future to any degree of specificity and prepare histories in advance. But if there are sentences which express something which is neither true nor false, it is not an omission of facts if such things are not expressed in a tenseless history. Such things equally cannot be facts or truths statable in (future) tensed sentences.

If we can characterize any state of affairs in a tenseless history as past, by implication we characterize all earlier states as past. Equally if any state can be characterized as future all later states are by implication future. If a tensed history provides a chronology of events, including some present event, the history can be rewritten in two parts: the first part comprising a tenseless history of the same events; the second comprising a description of some event as present. (Below I will refer to the two parts as the tenseless-part and the tensed-part). If we can characterize an event described in a tenseless history as present, we render the entire history in effect tensed. If we know that an event is now happening, we can determine the pastness, presentness or futurity of all other events if we know how they are B-related to the present event.

The tensed sentence which enables us to rewrite a tenseless history as tensed cannot have factual or descriptive content. If the tensed sentence expresses a fact not expressed in the tenseless - part of tensed history, two tensed histories could differ just in respect of what is said to be happening now. Two tensed histories which are identical in respect of their tenseless-parts could differ at all only if the tensed parts do express facts. In reducing a tensed history to a complex of a tensed and tenseless part, it is completely arbitrary which present event we chose to refer to in the tensed part. Whatever is simultaneous with what is now happening is also happening now. It is however equally arbitrary which, of all the events in the history, we choose to characterize as present. If E and F are non-simultaneous events, two tensed histories which differ only in that the tensed-part of one reads 'E is now happening' and the tensed part of the other reads 'F is now happening' are empirically identical. Whatever experiences confirm or disconfirm the one equally confirm or disconfirm the other.

The notion of a tensed history employed in this argument for the descriptive adequacy of tenseless sentences is just the notion of whatever we could consistently (though perhaps falsely) say about the world. A tensed history by being complete, by being whatever we

could consistently say, leaves nothing against which we can significantly contrast the temporal location of the whole series of (purported) events. Consider a fragment of such a history, say a putative account of a thirty year period. It makes sense in this restricted case to ask which, if any, of the events in the period are present. We cannot consistently entertain the notion of a world exactly like this one in all respects other than that it is, in the imagined world, a different time now. The notion may have some initial plausibility and appeal if we envisage our now having different experiences, say visiting with Aquinas or Aristotle. We do in some respects regard ourselves in contrast to the world (I will mention some of these respects just below); and it may seem as though we could be differently located in the same scheme of things. We are, however, sufficiently part of the world that our different location would amount to a different scheme of things.

The argument as stated above required as a premise the claim that there cannot be experiences which support only one of two possible histories differing just in respect of what is said to be present. The premise can be supported in the following way. If we have two possible accounts of what things are like and these accounts differ only in respect of which event it is that is said to be present (and hence, of course, also in respect of what is said to be past and what future), it may in some cases be possible to determine that only one account is empirically correct. Such cases must be those wherein the accounts are limited to a description of a finite section of the possible history of the world. Two accounts may be comprised of identical descriptions of some series of events $E_1 \dots E_n$ and differ only in that one account describes the series as future, the other as past. In this limited case there could be experiences attesting to only one of the accounts. The possibility of determining the correctness of only one of these accounts presupposes the possibility of variously locating the series $E_1 \dots E_n$ with respect to some other series, say, $F_1 \dots F_m$. If F_k is present, empirical confirmation of the claim that E_n is earlier than F_k confirms only the account which describes the E-series as past. We can regard this as the selective confirmation of one of two accounts differing only in what is said to be past, present or future. But to regard it in this way is to omit the

information that what is confirmed is, in part, that E_n is earlier than F_k . There can be support for just one of two incomplete accounts which differ only in the distribution of A-determinations. The completeness of a history leaves nothing against which its ascriptions of temporal location can be contrasted.

We could not formulate possible histories complete in the sense that nothing more could be added. The argument above does not require this impossibility. 'Whatever we can consistently say about the possible states of affairs in the world' constitutes a sufficiently strong sense of 'a possible history of the world'. To such histories there can always be added either greater detail or greater length. We can confirm one account of the series of events $E_1 \dots E_n$ and disconfirm the other because we know that F_k is present and later than E_n . The two accounts differ empirically because we can draw on more that might be said about the series of events, viz. that the latest number of that series is earlier than an event which is present. In the case of two limited accounts tensing can convey empirical information. A limited account is supported by the demonstration of its consistency with a broader account, which must in the confirmation situation be assumed correct. A limited account is disconfirmed if found inconsistent with an accepted broader account. If an account is expanded to include whatever might consistently be said about the world, there remains the possibility of additions in degree of detail but not the significant contrast between a possible fragmentary account and a larger body of established fact.

6. CONCLUDING REMARKS

Tenseless sentences, although descriptively adequate, are not alone sufficient to constitute a conceptual scheme within which we can both describe any possible state of affairs and determine which actual state of affairs obtains. Gale frequently treats fundamentality and unanalyzability as equivalent. Thus he wants to show that A-expressions are fundamental to our conceptual scheme because they cannot, he says, be analysed in terms of B-expressions. I want to show that, on the contrary, even though A-expressions can be reduced to B-expressions without loss of descriptive or informative content, A-expressions are an essential part of any language in which it is possible to confirm empirical propositions.

If any possible history of the world can be given tenselessly, so can the part of the history which deals with me. I confirm a possible history as giving a description of actual states of affairs by comparing the possible descriptions to what I experience and remember. That I have experienced such-and-such, that I now see this or remember that are, if rewritten tenselessly, simply descriptions of a possible individual's history. My personal history, rewritten tenselessly, might read: 'G.N. sees A at t_1 , thinks that p at t_2 , hears S at t_3 , etc.' If I compare such statements of a possible individual history to the remaining statements of any possible history of which they form a part, I at most determine that the individualizing descriptions of G.N. are consistent with certain other descriptions. In short, the most that such comparison can accomplish is the demonstration that the history is in fact a possible one; i.e., that it is self-consistent. If the form 'G.N. sees A at t_1 , etc.' were the only one in which my memories and experiences could be described or thought of by me, I could at most determine which histories are self-consistent and not which possible history is actual. Yet if all A-expressions (and other token-reflexives) were eliminated from language, my personal history could only be given in the form illustrated above.

The possibility of confirming empirical propositions requires a duality of linguistic forms. If I am to be able to compare a possible history to my own memories and experiences and thereby confirm the history, the form in which my history is expressible by me as mine must be different from the form it takes as part of a possible description of the world. Tenseless language freed of all token-reflexives is ideally suited to and provably adequate for description of the world. Tenseless language does not, by itself, provide the essential duality of linguistic forms in which I must be able to express both what I experience and remember and what, as a consequence, I believe the world is like.

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