A SEMANTIC STUDY
OF
SPATIAL AND TEMPORAL EXPRESSIONS
IN
ENGLISH

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A Semantic Study of Spatial and Temporal Expressions in English

(VOLUME I)

Marilyn E. Jessen
SUMMARY

An investigation into the semantic systems underlying spatial and temporal expressions is confronted with two major problems: the interplay of contextual factors in determining the interpretation of particular expressions and the inter-relations between the two semantic systems. The first of these is a recurrent theme throughout the dissertation; the second underlies its organization and orientation.

We begin, in Chapter 2, with a discussion of three recent studies on the semantics of spatial expressions in English. The conclusion is reached that more explicit attention must be given to the role of the intra-sentential context and, in particular, to the kind of situation being described by the sentence in which the expression occurs. We also recognize the need to give an explicit and comprehensive characterization of the notion of a journey, which latter is prerequisite to an understanding of such functional semantic elements as SOURCE, GOAL, PATH.

Chapter 3 is devoted to the semantic analysis of static uses of locational and directional expressions. A tri-partite distinction is made between direct locational expressions (e.g. 'at the post office'), semi-direct locational expressions (e.g. 'in front of the post office'), and indirect locational expressions (e.g. 'above the post office'). Static directional expressions (e.g. 'towards the post office') are subsumed within indirect locational expressions. The orientational properties of the speaker/observer are found to be crucial to the analysis of the meanings of semi-direct and indirect locational expressions.

Chapter 4 sets forth the historical background of the localist
hypothesis and surveys more recent arguments of a semantic and syntactic nature which have been given in support of it. According to the hypothesis, grammatical relations or functions, whether abstract or concrete, are ultimately describable in terms of spatial notions. The thesis of localism is set within a more encompassing theory of egocentric and anthropocentric extension operative throughout the language.

Chapter 5 enumerates and discusses the major contextual elements within the sentence which interact with the co-occurrence and interpretation potential of temporal adverbials. These comprise tense, the progressive form, negation, spatial adverbials, referential properties of the noun phrase, and lexical properties of the verb.

Chapter 6 redirects the focus to aspectual categories and to different kinds of propositions which some of the other contextual elements isolated in Chapter 5 participate in defining and with reference to which generalizations regarding co-occurrence and interpretations become statable. The logico-philosophical tradition with respect to verb classification is surveyed and then the linguistic literature on aspect, aktionsarten, and verb classes. It is suggested that a distinction be made between aspect, aktionsarten, and proposition type, what is common to these three categories being the role played by the concepts of existential status and change of existential status in their characterizations.

Chapter 7 begins with an informal characterization of a journey, first in its most concrete and idealized manifestation as a point moving from one point to another. The extension of locational relations, direction, directed movement, and journey to more abstract domains, including most importantly the existential and the temporal, is explored. The notion of existential location is incorporated
into a descriptive apparatus for the semantics of expressions of physical extension in one dimension. This same notion also leads to a natural interpretation of negation, quantification, aspect, and aktionsarten and provides for a precise formulation of a journey. A more generalized characterization of a journey is given which takes into account the extension of the moving object. A localist classification of proposition types is proposed.

Chapter 8 applies the framework developed in Chapter 7 to the analysis of tense and to the description of two selected sets of adverbials: (1) 'still', 'yet', 'already', and 'no longer' and (2) 'until' and 'since'.

Chapter 9 enumerates the main findings of the investigation.
ACKNOWLEDGEMENTS

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### CONTENTS

1. **INTRODUCTION**
   1.1 Nature of the study ................................................. 1
   1.2 Interrelationships between the semantics of space and the semantics of time ................................................. 6
   1.3 Structure of the dissertation ........................................ 10
   1.4 Framework, methodology and notation ................................ 13

2. **PREVIOUS APPROACHES TO THE SEMANTIC DESCRIPTION OF SPATIAL EXPRESSIONS**
   2.1 General remarks ....................................................... 18
   2.2 G. S. Cooper's semantic analysis of English locative prepositions ....................................................... 21
   2.3 G. N. Leech's analysis of place adverbials .......................... 25
   2.4 D. C. Bennett's observations concerning the locative-directional distinction ............................................. 35

3. **THE SEMANTIC DESCRIPTION OF VARIOUS SPATIAL EXPRESSIONS IN ENGLISH**
   3.1 General remarks on spatial expressions and spatial relations ....................................................... 44
   3.2 Direct location: 'at', 'on', 'in' ..................................... 49
   3.3 Semi-direct location .................................................... 78
   3.3.1 Preliminary remarks .................................................... 78
   3.3.2 'In front of'/'in back of', 'over'/'under', 'on the left of'/'on the right of' ............................................. 101
   3.4 Indirect location and direction ....................................... 122
   3.4.1 Preliminary remarks on order and direction .......................... 122
   3.4.2 Indirect locative expressions ....................................... 126
   3.4.3 Static directionals .................................................... 146
   3.5 Conclusion ............................................................... 150
# Table of Contents

## 4. THE LOCALIST HYPOTHESIS

4.1 Historical background ........................................... 153
4.2 Syntactic and semantic arguments in support of the localist hypothesis ........................................... 159
4.3 Psycholinguistic evidence ........................................... 173

## 5. THE ROLE OF THE INTRA-SENTENTIAL CONTEXT IN THE SEMANTIC DESCRIPTION OF TEMPORAL EXPRESSIONS

5.1 General remarks ................................................... 184
5.2 Contextual factors ................................................... 188
5.2.1 The noun phrase within the temporal adverbial ............. 188
5.2.2 Tense ........................................................... 192
5.2.3 The progressive form .......................................... 215
5.2.4 Negation ......................................................... 218
5.2.5 Spatial adverbials .............................................. 222
5.2.6 Noun phrases ................................................... 225
5.2.7 'Begin', 'continue', 'stop', etc. ................................ 226
5.2.8 Verb classes ..................................................... 228

## 6. ASPECT AND PROPOSITION TYPES

6.1 Introductory remarks ............................................. 235
6.2 The philosophical tradition ...................................... 237
6.2.1 General remarks .................................................. 237
6.2.2 Aristotle's 'kineseia' and 'energeiai' .......................... 238
6.2.3 Kenny's 'performance', 'activity' and 'static' verbs ....... 246
6.2.4 Ryle's 'achievement' and 'task' verbs ...................... 255
6.2.5 Vendler's 'state', 'activity', 'accomplishment' and 'achievement' verbs ........................................... 260
6.2.6 Von Wright's logic of change and action .................... 268
6.2.7 The treatment of situations as individuals .................. 276
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3</td>
<td>The linguistic tradition</td>
<td>277</td>
</tr>
<tr>
<td>6.3.1</td>
<td>General remarks</td>
<td>279</td>
</tr>
<tr>
<td>6.3.2</td>
<td>The extension of 'aspect' to the description of non-Slavonic languages</td>
<td>285</td>
</tr>
<tr>
<td>6.3.3</td>
<td>Recent developments</td>
<td>304</td>
</tr>
<tr>
<td>6.3.4.1</td>
<td>Garey's contribution</td>
<td>304</td>
</tr>
<tr>
<td>6.3.4.2</td>
<td>The relationship of zeitcharakter to categories of the noun</td>
<td>309</td>
</tr>
<tr>
<td>6.3.4.3</td>
<td>Leech's state and event predications and rules of semantic concord</td>
<td>315</td>
</tr>
<tr>
<td>6.3.4.4</td>
<td>Macaulay's treatment of aspect as a transferred syntactic feature</td>
<td>320</td>
</tr>
<tr>
<td>6.3.4.5</td>
<td>Verkuyl's compositional analysis of the aspects</td>
<td>340</td>
</tr>
<tr>
<td>6.3.4.6</td>
<td>Dowty's semantic analysis of Vendler's categories</td>
<td>352</td>
</tr>
<tr>
<td>6.4</td>
<td>Conclusion</td>
<td>362</td>
</tr>
<tr>
<td>7.1</td>
<td>An informal characterization of a journey</td>
<td>366</td>
</tr>
<tr>
<td>7.2</td>
<td>Abstract location and direction and abstract journeys</td>
<td>382</td>
</tr>
<tr>
<td>7.3</td>
<td>Existential spatial constructs</td>
<td>391</td>
</tr>
<tr>
<td>7.3.1</td>
<td>Existential locatives</td>
<td>391</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Physical extension</td>
<td>394</td>
</tr>
<tr>
<td>7.3.3</td>
<td>Negation and quantification</td>
<td>412</td>
</tr>
<tr>
<td>7.4</td>
<td>Temporal location and extension</td>
<td>417</td>
</tr>
<tr>
<td>7.4.1</td>
<td>Preliminary remarks on linguistic time</td>
<td>417</td>
</tr>
<tr>
<td>7.4.2</td>
<td>The verbs of aktionsarten, 'last' and durational adverbials</td>
<td>422</td>
</tr>
<tr>
<td>7.4.3</td>
<td>Existence in time of first-order entities</td>
<td>428</td>
</tr>
<tr>
<td>7.4.4</td>
<td>Bounded versus unbounded entities and the progressive form</td>
<td>431</td>
</tr>
</tbody>
</table>
7.5 A formal characterization of extended journeys and border-crossings ........................................ 437

7.5.1 Border-crossings and directed movement ........................................ 437

7.5.2 Extended journeys and 'finish' ........................................ 443

7.6 A more general conception of a journey ........................................ 459

7.6.1 General remarks ........................................ 459

7.6.2 Border-crossings by an object with extension ........................................ 460

7.6.2.1 Statement of the problem ........................................ 460

7.6.2.2 Related problems with the 'moving-ego' and 'moving-time' spatial metaphors ........................................ 461

7.6.2.3 A partitive analysis of border-crossings ........................................ 466

7.6.2.4 A partitive analysis of extended journeys ........................................ 469

7.6.3 Sentence types describing journeys of a less concrete nature ........................................ 471

7.6.3.1 Consuming, expelling, filling up and emptying out ........................................ 471

7.6.3.2 Acquisition and loss of knowledge ........................................ 476

7.6.3.3 Growth, transformations, translations, performances, and instantiations ........................................ 483

7.6.3.4 Creation and destruction ........................................ 494

7.7 Duration, frequency and iteration ........................................ 502

7.8 Proposition types ........................................ 518

8. APPLICATIONS TO THE ANALYSIS OF TENSE AND TEMPORAL ADVERBS

8.1 General remarks ........................................ 525

8.2 Tense and aspect ........................................ 525

8.2.1 Past versus non-past ........................................ 525

8.2.2 Inclusive tense ........................................ 546

8.3 'Still', 'yet', 'already', and 'any longer' ........................................ 570

8.3.1 Preliminary remarks ........................................ 570

8.3.2 Previous approaches ........................................ 571
INTRODUCTION

1.1 Nature of the study

As a study in descriptive linguistic semantics, this dissertation has as its main objective the investigation and systematization of some aspects of the meanings of those expressions in sentences of English which convey spatial and/or temporal information. The general conception of the framework and conditions of adequacy are dictated by the following three major considerations.

First of all, it has to be recognized and accounted for that spatial and temporal elements of meaning are not confined to a particular sub-system of the language, namely the adverbial system, but are dispersed throughout the sentence: much of the whole linguistic system is permeated by the semantic systems of space and time, and hence there can be expected to exist a complex interpenetration of 'grammar' and 'lexicon' with respect to this semantic field. This is not to deny the existence of well-defined (lexical) sub-sets.

We will not attempt to review the history, principles and techniques of nor the descriptive work done within that branch of semantic investigation known as 'field theory'. Many excellent and detailed discussions of such aspects of the theory already exist and could not be improved upon by the present writer. Particular reference can be made to Chman, 1951; Ullmann, 1957, 1962; Lyons, 1963, 1968a, forthcoming. It should be pointed out, however, that the term 'semantic field' is here being given a broad interpretation: it is not to be understood as restricted to lexical fields. This view accords with Lyons who defines a lexical field as one kind of semantic field: "Lexemes, expressions and other units that are semantically related, whether paradigmatically or syntagmatically, within a given language system can be said to belong to, or to be members of, the same 'semantic' field; and a field whose members are lexemes is a lexical field. A lexical field is therefore a paradigmatically and syntagmatically structured subset of the vocabulary (or lexicon)" (Lyons, forthcoming: 284).
of the vocabulary which, by means of the paradigmatic and syntagmatic sense relations holding among their members, structure or inform spatial and temporal semantic fields. However, such lexical systems do not exhaust the surface realizations of spatial and temporal notions (since many are syntagms or simply grammatical elements), nor explicate the precise semantic function (e.g. locational versus destinational, locational versus durational, etc.) which a particular lexeme or phrase has in a particular context, nor account for covert categories (cf. Whorf, 1956: 89) which may involve spatial or temporal notions. Our central concern, therefore, is with the distribution of spatial and temporal information in the semantic representations of entire sentences; and a view of the mapping relation between semantic representations and phonetic strings has been adopted (or, at least, presupposed) which accommodates both the lexicalization and grammaticalization (and degrees thereof) of semantic structure. In this latter respect, the approach is akin to that of the generative semanticists. 1

Secondly, not all spatial and temporal adverbials can co-occur in all sentences. That co-occurrence restrictions on these classes of adverbials exist is by no means an original observation. However, what we are seeking in this study is not simply a statement of co-occurrence restrictions that is hardly more than observational—such as feature-based selectional restrictions—but rather an account in terms of the logico-semantic properties and structure of the expressions involved. That is to say, rather than ending an analysis

with a conclusion to the effect that, for example, +IMPERFECTIVE verbs like 'dance' can co-occur with +DURATIVE adverbials like 'for two hours', where +IMPERFECTIVE and +DURATIVE are primitive semantic components of the meanings of the expressions, we want an explanation as to what it is about the semantic structure of +IMPERFECTIVE verbs—other than that they contain that feature—and the semantic structure of +DURATIVE adverbials which make them compatible with each other. (This entails, of course, a subscription to the belief that what have been called syntactic selectivity restrictions are, in most cases, ultimately semantic in nature—of. Weinreich, 1966; McCawley, 1968a).

Thirdly, and this is related to the preceding point, the interpretation of spatial and temporal adverbials is often dependent upon other elements of the sentence; and we want to be able not only to predict what interpretation a given occurrence of an adverbial will have, but also to explain why it has that interpretation rather than another. That is, the semantic correlates of particular combinations of adverbials and certain elements of their intra-sentential context should follow naturally from the semantic characterizations of the expressions involved and their structural arrangement. In these last two objectives we are close to Bull in his seeking out of the 'exchange value' of particular categories. He states (1960: 45):

'It is important to establish a basic principle which has been largely ignored in descriptive linguistics, namely, that the systemic properties of events, which are labeled by verbs, interact with the systemic properties of the referents of other parts of speech, and this interaction produces meaning which cannot be conveyed by the individual elements of the syntactical combination... This
meaning resulting from such interaction\(^7\) can only be determined by observing that the combinatorial events belong to different categories which have entirely different exchange values which, in addition, are different and apart from the exchange values of each event in a specified category. It is at this point that the structural linguist must appeal to the semanticist for a description of how a language really works and, of course, for the criteria needed to establish a link between purely physical syntactical distribution, which requires no significant preoccupation with meaning, and any refinement on distribution which results in the definition of function.\(^1\)

These three considerations force us to consider the context in which a particular spatial or temporal adverbial occurs and to integrate this information into the theoretical and descriptive apparatus. In other words, to have a description of these.

\(^1\) Although Bull directs his attention to the exchange value of particular categories of events (or 'situations'---cf., below) with respect to the category of time, the same principle is involved when we consider the semantics of spatial expressions. Both Lindkvist's (1950, 1972) and Bennett's (1972) studies are illustrative in this regard, but neither comes to grips with the problem. Although Lindkvist intuitively characterizes various classes of events or situations which are each correlatable with a different use or interpretation of the spatial prepositions he is concerned with, he does not show how these various interpretations are systematically related to each other nor, consequently, how they are derivable from a consideration of the intra-sentential context. Bennett, on the other hand, does manage to relate the possible interpretations of a particular spatial expression. However, he makes no attempt to delimit or characterize the classes of events or situations denoted by the sentence which induce or select the various interpretations and hence also leaves uncovered the semantic principles of interaction between event or situation types (or, rather, the linguistic encoding thereof) and classes of spatial expressions.
expressions which is not only descriptively adequate\(^1\) but which also approaches some degree of explanatory adequacy—in the sense that logico-semantic structures are constrained by universal principles which can be related to properties of the extra-linguistic world which the logico-semantic system of the language models\(^2\)—then their characterizations must be such that, given the various contextual factors and an adequate semantic characterization of these, the particular interpretation in a particular context of a given adverbial, as well as its compatibility with or exclusion from the context, follows naturally.

It should perhaps be stressed, at this point, that with the exception of the spatio-temporal coordinates of the utterance of a sentence, we are, in general, restricting ourselves to the linguistic textual context, i.e. to the verbal and prosodic features of the connected sequence of sentences of which the sentence

\(1\) A grammar is descriptively adequate if it models or explicates the native speaker’s tacit competence to produce and correctly interpret a potentially infinite number of well-formed sentences of his language—cf. Chomsky, 1965.

\(2\) We have in mind here a kind of adequacy of explanation similar to that which has been shown to be possible in the realm of phonology and also in syntax whereby generalizations—such as impossible or unnatural sequences of phonetic elements, possible sound changes, constraints on embedding, deletion, extrapolation, etc.—can be seen as determined, at least partly, by extra-linguistic factors such as physiology (the possible movements and arrangements of the articulatory apparatus) and perception (the discrimination of distinctive features, perceptual decoding or processing strategies) and physics (the acoustic stability of particular sounds or clusters of sounds)—cf. Chali, 1973; Kiparsky, 1975; Bever, 1970; and Bever & Langendoen, 1971, 1972.

In the case of semantics, many laws of nature—i.e. physical constraints and structural principles of our world—and general principles which determine human perception and concept-formation can be expected to have correlates in the logico-semantic structure of the language used to refer to and describe that world.
concerned is a part. Furthermore, we are specifically interested in textual relations holding within a sentence, i.e. the intrasentential context. However, on occasion reference is also made to other sentences in the same text (for example, when we must speak of the kind of question to which a given sentence would be a suitable answer, or when we speak of a given sentence being a denial or confirmation of a previous sentence, or, more generally, when a sentence is placed in a textual context in order to resolve an ambiguity or remove an indeterminacy or to highlight some aspect of its meaning).  

1.2 Interrelationships between the semantics of space and the semantics of time

The content of the thesis divides only roughly into two central parts, one concerning itself with the semantic description of spatial expressions (mainly adverbials) and one with the semantic description of temporal expressions (again, mainly adverbials). In actual fact, the situation is much more complex than this, the interpenetration of the spatial and temporal systems being extremely intricate and highly structured. In the one direction, the meanings and, derivatively, the interpretation and co-occurrence possibilities of many spatial expressions depend upon a complex spatio-temporal construct which I have termed a 'journey' (cf. §7.1). In the other direction, there are at least two types of dependency. First, there is the conceptual and perceptual parallels between a one-dimensional space and the time axis (cf. H. Clark, 1973), this

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1 For a comprehensive discussion of the distinctions between types of contexts made here, the reader is referred to Lyons, forthcoming: §10.1.
having its most obvious linguistic reflection in the parallel application of many expressions to both spatial and temporal constructs (c.f. J. Geis, 1970; Pottier, 1962), a semantic congruency which is the one most often cited when discussing the isomorphism of the two systems (c.f. Leech, 1969: 240). Secondly, and perhaps more interestingly, the meanings and the interpretation and co-occurrence potential of many temporal adverbials or other expressions depends upon, among other contextual factors, the type of 'situation' (as a general term for the denotation of a sentence—cf. Reichenbach, 1966: 15—superordinate to the terms 'state', 'activity', 'process', 'event', etc.) being described by the rest of the sentence. And such a classification of situation types—each with their corresponding proposition type (characterizable by logical structure) can be seen to be analyzable in terms of, and to be in some sense derivative of, the more concrete notions of location, direction, and journey, i.e., essentially spatial notions.

Furthermore, the semantic relationship between propositions and their temporal specification (as a reflection of the physical

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1 Cf. also Talmy's (1972) use of the term 'situation'.

2 Our use of 'situation' in this sense conflicts with its (perhaps more familiar) application to the extra-textual context of an utterance ('situational context'/'situation of utterance'). However, it is desirable to have such a superordinate term, and of all the possible ones which present themselves (which are not many and which are all not entirely felicitous) 'situation' seems to be most neutral as regards whether we are talking about a state of affairs or about an action and has been chosen for this reason. Furthermore, there exists a fairly appropriate alternative to the other use of the term, namely 'setting'. Katz and Fodor (1964) use 'setting' in a broader sense to include both the textual and the non-textual context of a sentence. We will use it in the latter application only.
relationship between situations and their temporal location and/or extension is not, in general, a direct one but rather is mediated by what we may call for now a predication of the 'existential status' of the situation. (That is, it is phases of situations which are located in time.) And 'existential status' can also be given an abstract spatial interpretation. Thus, anticipating somewhat, sentence 1, to take a simple example, expresses the proposition that

1. John was asleep at midnight

the situation of John being asleep was in existence at the point of time identified by 'midnight' plus the past tense. The same is true of sentence 2., but here the progressive form (permissible here

2. John was sleeping at midnight

because of the perhaps arbitrary linguistic encoding of the situation as an activity rather than a state) gives overt manifestation to the predication of existence. Now, the aspecural-aktionsarten system of English, as well as such predications as 'last', 'take place', 'happen' are overt (grammatical and lexical) manifestations of such existential predications. These latter are also very pertinent in explicating the co-occurrence possibilities and interpretations of

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1 Cf. Chapter 6 for a discussion of aspect and aktionsarten. These terms have had no uniform or consistent application in the literature, sometimes being used for semantic distinctions, sometimes for formal distinctions, and often for both, without an explicit differentiation being maintained between the two levels of description. The distinction between aspect and aktionsarten is likewise ill-defined, formally having something to do with (roughly) the distinction of grammaticalization versus lexicalization and semantically with, perhaps, such distinctions as subjective versus objective, static versus dynamic. For present purposes, we include under the aspecural-aktionsarten system such grammatical devices as 'be-ing' and such lexical devices as the small closed set of periphrastic verbs like 'begin', 'continue', 'stop', 'finish'.
temporal adverbials in that they function in the schematic, logical, characterizations of the various proposition types. If it is postulated that all temporally specified propositions involve existential predications even when there is no overt reflex of such (as is the case in 1. above), then not only does the semantic analysis of aspect and aktionsarten not require the introduction of any special constructs but also the shared co-occurrence possibilities and interpretations of the following types of sentences are accounted for.

3.a. The search for the missing file lasted \{ for ten minutes \} in ten minutes \{ at noon \}

b. They searched for the missing file \{ for ten minutes \} in ten minutes \{ at noon \}

4.a. The demolition of the entire building took place \{ for two hours \} in two hours \{ at noon \}

b. The entire building was demolished \{ for two hours \} in two hours \{ at noon \}

5.a. The collision of the two lorries occurred \{ at noon \} in two hours \{ for two hours \}

b. The two lorries collided \{ at noon \} in two hours \{ for two hours \}

---

1 This sentence is, of course, well-formed, but its interpretation does not correspond to that of 3.a. but rather to that of 3.a.' below, in which 'begin' is a different existential predicator.

3.a.' The search for the missing file began at noon

2 We are not considering the possible interpretation here in terms of iterativeness. This interpretation is less likely if we substitute 5.b.' in place of 5.b.

5.b.' The two lorries had a collision \{ at noon \} in two hours \{ for two hours \}
The necessary and natural inclusion of problems of aspect and aktionsarten greatly increases the scope of the thesis. However, it is believed that, even if many problems within this area can only be dealt with in a rather superficial way, the degree of descriptive and explanatory adequacy achieved in the over-all description justifies their incorporation.

Such considerations—the varied interrelationships between the semantic systems of space and time, the important role of aspect and aktionsarten and their existential-locative basis, and the role of intra-sentential contextual elements and relations in general—make the structure and exposition of the dissertation somewhat complex, episodic, and, as has been intimated, difficult to compartmentalize into two parts which, if not independent, would at least be in a unilateral relationship of dependence or presupposition. (It has been customarily assumed that the temporal system in some sense depends upon, is a metaphorical extension of, the spatial system.) It is hoped that the following synopsis of the thesis will be helpful in making clear how the framework and the argument is to be developed through each of the following chapters.

1.3 Structure of the Dissertation

Chapters 2 and 3 deal mainly with the semantic description of spatial expressions. However, the discussion and the proposals made at this point are limited to the purely locative and directional expressions (in their most concrete applications), i.e. to those whose semantic representations do not involve any reference to paths or journeys. The role of these latter notions in explicating the
meanings of several spatial expressions will be discussed informally, but the notions themselves will not be given a precise characterization until Chapter 7. We begin, in Chapter 2, with a brief review of three previous studies on the semantics of spatial expressions (Cooper, 1968; Leech, 1969; Bennett, 1972). Then follows, in Chapter 3, a detailed investigation and systematization of some of the more important spatial expressions in English, taking contextual information into account in the ways discussed above. In anticipation of the analysis of more abstract domains—particularly the temporal and existential—in terms of spatial notions, a brief exposition of the so-called 'localist hypothesis' or 'thesis of localism' is given in Chapter 4.

Since context plays an even more fundamental role in the semantics of temporal expressions, we begin our investigation into this domain with a survey and discussion in Chapter 5 of the more important elements of the sentence which must be taken into consideration. The most important contextual factors, and in some respects subsuming most of the others, are the related and often confused ones of the proposition type or the type of situation being described by the sentence and the aspect of the sentence. As these critical features of the context have, under one rubric or another (e.g. verb classes, aspect, aktionsarten; predication types), attracted the attention of linguists and also of many philosophers (though not always with the same goals in mind), Chapter 6 is devoted to a review of some of the major
approaches to this area of investigation found in the linguistic and philosophical literature. This will serve as a background for the particular localist treatment of aspect and proposition types to be given in the following chapter.

Chapter 7, then, attempts to explicate the notion of a journey, first of all in its most concrete interpretation. Its characterization, developed informally to begin with, involves the semantic constructs of location, directed movement (treated initially as a primitive), and the notion of temporal succession. We then survey how these basic spatial notions, as well as the more complex construct of a journey and its 'as-linite', which we call a border-crossing, are operative in more abstract domains. In particular, the important notion of existential location is introduced and incorporated into a descriptive apparatus for the semantics of expressions of physical extension in one dimension. We return here briefly to some of those spatial expressions whose semantic description we were unable to accomplish before as they involved the notion of a path. A brief discussion of negation and quantification in natural language as based upon existential locatives is given. After a short excursus into the structuration of time insofar as it is linguistically relevant or determined, the semantics of aspect, aktionsarten and proposition types and their interaction is explicated with reference to the same existential predicates motivated for the semantics of physical extension, the essential difference between the two semantic domains being that between existence in time and existence in space, respectively. A more
formal and generalized characterization of a journey is offered and problems arising in the semantic analysis of sentences describing abstract journeys, especially existential ones, are pointed out. A brief look at sentences describing repeated or iterated situations leads us finally to some proposals for a more comprehensive localist classification of proposition types.

The framework developed in Chapter 7 is applied in Chapter 8 to the description of two interesting sets of temporal adverbials not discussed so far. However, as some temporal information in the semantic representation of a sentence is realized as tense and as the semantics of the perfect form, in particular, is relevant to the analysis of our adverbials, the chapter begins with a brief, and necessarily simplified, account of the analysis of tense, taking into consideration the aspect and proposition type of the sentence. An analysis of the perfect form in terms of a dual time reference is proposed—one which will allow for a contextual explanation for the various interpretations attributable to the perfect. Finally, we proceed to the detailed description of the selected set of adverbials.

Chapter 9 concludes the thesis with an enumeration of the main findings of the study.

1.4 Framework, methodology and notation

As the descriptive and theoretical framework is developed in the
course of the exposition, little need or can be said about it at this point. However, it may be emphasized that our central concern is with the determination and characterization of the meanings of spatial and temporal expressions and the semantic correlates of their combination with other elements of the sentence. To the extent that these appear to be best stated in terms of the meaning of the whole sentence, we are directing our efforts towards giving the logico-semantic representations of sentences of English. That is, we are not directly concerned with the problems of realization—although we have tried not to be oblivious to them. Hence, we have found it unnecessary to embroil ourselves in such controversies as that between interpretive semantics (or, more generally, the extended standard theory) and generative semantics. Nor will we delve into model-theoretic semantics, not because we feel that the problems belonging under this rubric are outside the scope of our investigation, but rather because its appropriateness and usefulness in the description of natural language can be questioned (cf. Potts, 1973; Jardine & Jardine, 1973) and because we feel that much of the 'interpretive' apparatus is superfluous, given sufficiently rich yet still syntactically and semantically motivated logico-semantic representations.


3 Cf. in this light Anderson's (1974) proposal, on syntactic grounds, for a predication of existence (=truth) as the main proposition in declarative sentences such as 'Beatrice came'. Cf. too the explanation given in Chapter 7 for the unacceptibility of sentences such as 6.a, below with the model-theoretic approach of Dowty (1972). (References to Anderson are to works by J. M. Anderson.)
The data used to arrive at such representations are, generally speaking, of two sorts. First, there are matters of distribution, of co-occurrence potential. Secondly, there are semantic relations between sentences—implication, paraphrase, inconsistency—and semantic properties of single sentences—being significant, contradictory, tautologous, ambiguous. Many sentences in which co-occurrence restrictions have been broken are, ultimately, resolvable into semantic anomalies: they may encode contradictions or tautologies or they may not be correlatable with any well-formed semantic structure or they may have semantic representations which are not in accordance with basic axioms of the semantic system. These possibilities are illustrated in sentences 6. to 8., respectively.

6.a. "John found the answer for five minutes"
6.b. "Mary stopped knitting the sweater when she finished it"
7. "John rode his bicycle in five minutes"
8. "Mary is not yet a virgin"

Sentences like 6.a., it is shown in a later chapter, encode the contradiction that at one and the same moment of time something both is and is not the case—in this instance, John's knowing the answer. Sentence 6.b., on the other hand, encodes a tautology, the first conjunct necessarily following from the second. And this is found to be predictable from the logical properties of the predication. "Mary knit a sweater" and the expressions 'stop' and 'finish'. In 7., the expression 'in five minutes' and the proposition 'John rode a bicycle' have logical structures which are intrinsically incompatible. By this is meant that, because of their internal logical structure, it is impossible to 'hook up' one with the other. Finally, sentence 8. implies the possibility that an axiom of the system
can be violated, specifically, that something which is the case can come to not have been the case.

(Pragmatic) implication and paraphrase (bilateral implication) are used to reveal ambiguities in sentences, to help determine what information must be present in the logico-semantic representation of a sentence, and to establish the logical properties of and semantic relations between various expressions. If a given sentence has $n$ paraphrases which are themselves not paraphrases of each other, then the sentence is $n$-ways ambiguous. For example, sentence 9. below has the two non-equivalent paraphrases 10. and 11. and hence is (at least) two-ways ambiguous. Although non-equivalent, the two paraphrases are not inconsistent with each other, as their conjunction in 12. illustrates. Of course, inconsistent implications can be

9. John will mend the shoe in five minutes
10. John will (start to) mend the shoe five minutes from now
11. John will take five minutes to mend the shoe
12. John will (start to) mend the shoe five minutes from now and he will take five minutes to do it

used instead of non-equivalent paraphrases to establish ambiguity.

One must be careful when using implication tests that the implication in question is not a contextually dependent one. This is the case in sentences involving such spatial expressions as 'in front of'/'in back of' (or 'behind'), 'on X's right'/'on Y's left'.

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1 Cf. Lyons, forthcoming: 214, for the following definition: "A statement, $S_1$, pragmatically implies a statement, $S_2$, if the production of $S_1$ would normally be taken to commit the speaker not only to the truth of $S_1$, but also to the truth of $S_2$".

2 Here we have in mind such properties of predicates as symmetry, reflexivity, transitivity (cf. Hall, 1972: § 5.) and such sense-relations between expressions as hyponymy, antonymy, converseness, complementariness, synonymy (cf. Lyons, forthcoming: § 8.3).
Although in a well-defined class of contexts these pairs satisfy the conditions of converseness, this is a pragmatic fact. For, in general, it is not the case that a sentence of the form 'X (is) in front of Y' is equivalent to a sentence of the form 'Y (is) in back of X'. For example, sentence 13, does not imply any of the mutually inconsistent sentences 14., 15., and 16. However, it is consistent with any one of them on their own.

13. John is standing in front of Mary
14. Mary is standing in front of John
15. Mary is standing in back of John
16. Mary is standing on John’s left/right

The notation and formalism which we have adopted and developed in the course of the following chapters is based on that of symbolic logic, mainly the propositional calculus and the calculi of classes and of (predicative) functions. It must be stated from the onset, however, that no attempt is made to construct a rigorous axiomatic logical system which could be tested for such things as completeness and decidability. Rather, we are making use of logical notation and concepts as a precise aid to semantic representation and this only to the extent that it remains perspicuous and linguistically accurate. We have not hesitated in deviating from such formalism when the occasion has demanded it (for example, in the characterization of quantification). Furthermore, we often make use of tree-like diagrams in our logico-semantic representations rather than the usual bracketing found in logical notation since these, for the linguist at least, have become a more easily digestible schema of representation.

1Cf. Wall, 1972, for a lucid account of these different calculi.
II

PREVIOUS APPROACHES TO THE SEMANTIC DESCRIPTION
OF SPATIAL EXPRESSIONS

2.1 General remarks

Throughout the linguistic literature of the past forty years or so there are many observations to be found on the uses and meanings of various spatial (or locational and directional) expressions, particularly adverbials, in English and related languages. Although the discussions have been mostly fragmentary or incidental in nature and far from exhaustive in scope, and although the formalizations or systemizations, when attempted, are of a diverse nature and often only partial, it is probably not too much of an exaggeration to say that almost everything there is of interest to say about this area of linguistic investigation has already been said, in one form or another. And probably all that one can reasonably hope to contribute to such a stockpile of knowledge is a presentation which synthesizes the results of past studies in such a way as to be somewhat more comprehensive in scope and more uniform in systemization. One may also hope to fill in any gaps which still remain with some original insights. However, since such a synthesis would itself require a whole dissertation our discussion will centre on the more interesting and central spatial expressions; and those which are of more peripheral concern will necessarily be in outline form, with often only informal analyses given—but ones suggestive of the form which an eventual formalization would take.

The many and varied observations on and descriptions of the semantic system(s) underlying spatial expressions in English (and
other languages) have, for the most part, taken as their point of departure the meanings expressed by the (concrete) locational and directional adverbials and, in particular, by prepositional phrases. Furthermore, the major approach has been to analyze the prepositions (as for cases, cf. Hjelmslev, 1935; Lyons, 1968a) as expressing a (spatial) relation between two objects (cf. Brøndal, 1950, for prepositions in general; Cooper, 1968; Leech, 1969, for explicitly relational analyses of spatial expressions, and Bennett, 1972, for a functional (and implicitly relational) approach). Both these aspects of previous treatments will be taken as basically correct and will be pursued in what follows. However, with respect to the first, it is necessary to recognize the fact that the adverbial system in itself does not exhaust the possibilities for the expression of spatial relations in English even though it is true that "the prepositions and adverbs are...the most simple and most typical means of expression which make the relations explicit" (Collinson, 1937: 54) and hence the most natural set of expressions with which to make an entry into this semantic field. Considerations of the role of the verb in this respect are to be found briefly in Bennett (1972) and more extensively in Gruber's (1965) study of the 'incorporation' of 'pre-lexical' prepositions within verbs (cf. also the discussion by Vinay & Darbelnet (1968) and Tesnière (1966) on the 'chassée-croisé' phenomenon between French and English). Related to this problem is the fact that the semantic interpretations of the various adverbials vary according to the context in which they occur; that is, there is an interaction between the adverbials and other elements of the sentence, in particular the verb, with respect to what spatial relations are expressed. Finally, an adequate semantic description
for many spatial prepositions and other expressions involves the incorporation of a complex notion, that of a 'journey' (cf. Chapter 7), which is itself constructed out of the simpler locative and directional primitives (cf. § 7.1) plus some notion of temporal succession. Both Leech's (1969) and Bennett's (1972) studies presuppose such a complex notion, and the major drawback of both their analyses could well be considered the failure to give an explicit and/or adequate characterization of this fundamental construct. Summarizing, then, it is necessary to work towards a descriptive framework which can accommodate (1) the realization of spatial relations by expressions other than adverbials, (2) the contribution made by the intrasentential context of the adverbials in determining their semantic interpretation, and (3) the integration of de-sentential (or de-propositional) information relating to journeys within the semantic description of particular adverbials and verbs.

Three studies have appeared in the past few years (Cooper, 1968; Leech, 1969; Bennett, 1972), varying both in coverage and in the degree and type of formalization adopted, which are of particular interest here, as they represent the most detailed semantic studies of English spatial expressions available. Of these, the last two have been drawn upon extensively in what follows. Cooper's study, being considerably less well known and rather difficult to gain access to, came to the author's attention only after most of the revised analysis to be presented in § 3.3 had already taken its present shape. However, it was a happy discovery in that Cooper's approach was found to be similar in several respects to the one which had been adopted here to deal with some of the insufficiencies of Leech's and
Bennett's analyses. For this reason, it will be briefly summarized along with the others.

2.2 G. S. Cooper's semantic analysis of English locative prepositions

Cooper's study is restricted to locative prepositions. That is, the semantic field investigated is limited both with respect to content (expressions of directional relations being excluded\(^1\)) and with respect to expression (locational relations expressed by other parts of speech being excluded). Furthermore, it is inherently limited by the particular formal system adopted (but in no way argued for or elaborated upon), that of the restricted and now outdated system of interpretive semantics as set forth in Katz (1966), and, within that, a rather a priori delimitation of what can constitute the semantic representation of a locative preposition: "a reading for a preposition consists of a complex semantic marker which itself consists of a relation marker and function markers operating on objects" (Cooper, 1968: 1). This results in the analysis being unable to accommodate those locative prepositions, such as 'up' in the house up the road, the boat up the river, whose readings "involve markers...such as (direction one faces) or (path one traverses), namely, markers of movement" (ibid.: 30).

However, these considerations aside, as well as other criticisms of detail which one could make—for example, with respect to errors, vagueness, and the use of undefined markers in many of the definitions—Cooper's study is interesting and insightful in two major respects.

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\(^1\) However, many of her semantic markers (e.g. top\(X\)/bottom\(X\), distal\(S(X)\)/proximal\(S(X)\)) implicitly include some 'directional opposition' (cf. Lyons, forthcoming: 300).
First of all, as is evident from the first quotation above, Cooper recognizes the relational basis to the senses of (locative) prepositions (cf. Hjelmslev's (1935) discussion of the notional characterization of the categories of case and prepositions) and also the fact that it is often only particular parts or aspects of the objects related by the preposition which are semantically relevant or salient. This she formalizes not in terms of semantic features (cf. Allan's (1970) 'highlighted' features, Leech's (1969) 'ascription' features) but by functions—as a special kind of relation—which extract, so to speak, the relevant properties of the objects involved. More precisely, "locative prepositions, unlike nouns and adjectives, specify relation-concepts with two or more arguments. Thus, in general, the meaning of the preposition must be given in terms of the relation markers and function markers instead of the sort of marker which specifies a property concept. Locative prepositions specify a spatial relation between a small subset of the characteristics of the objects indicated by the expressions which are

1 It is an essential property of Cooper's framework that the 'things' related by a preposition (or, more accurately, the arguments of the relation expressed by the preposition) need not be restricted to the class of concrete objects but may also be points, areas and volumes—i.e., spaces—which are themselves perceived as 'single figures'. Thus, locative uses include such expressions as "the book on the table", "the fly in the hole", or "the gap in the mountain". A locative seems to function semantically in the same way whether the referents of $N_1$ and $N_2$ are objects or spaces" (Cooper, 1968: 6).

2 Mathematically, a relation is a function when all the members in its domain are mapped uniquely onto members of its range. Thus, the function $i( )$—see below—assigns to every object another object, and only one, which is its interior.
connected by the preposition. Thus, the meaning of the preposition can be analyzed, first, with function concepts which pick out the relevant characteristics to be related, and second, with the relation concept describing the special relation between the values of the functions. The resulting complex relation marker will thus have the form \( R(f(\quad), g(\quad)) \) where \( f \) and \( g \) are function markers and \( R \) is a relation marker (Cooper, 1968: 8). Thus, to take a specific example, \( L(X,Y) \) has the interpretation (given that \( Y \) is a place and \( X \) a physical object or spatial configuration) that \( Y \) is the location of \( X \). Now, if \( i(W) \) stands for the space or volume internal to \( W \), then \( L(X,i(W)) \) represents the meaning of the preposition 'in'.

Secondly, by basing the interpretation of her semantic markers on visual perceptions or conceptualizations, Cooper is able to introduce a variable, \( Z \), into her system whereby \( Z \) is "a space defined by some relationship(s) to \( X \) and/or \( Y \), the arguments of the prepositional relation" (Cooper, 1968: 11). This notion, albeit it a rather difficult one to make precise and one used rather equivocally by Cooper, has no counterpart in Leech's (or Bennett's) system. It also accounts for the sharpest and most interesting contrast between the two, particularly in the domain of the definitions accorded such pairs as 'over'/under', 'in front of'/in back of' ('behind'). Leech (see below) analyzes these expressions in terms of an ordering relation on the two objects involved (the direction of the order being determined with respect to some polarizing feature of the context—cf. fn. 2 p. 34). Cooper, on the other hand, treats these expressions as describing locations internal to a space, \( Z \), defined in terms of contiguity with some part (the top, bottom, front, back, etc.) of the object serving as the reference object.
(i.e., the second argument of the prepositional relation). This part of Cooper's analysis draws heavily upon Teller's (1969--
Cooper's bibliography includes an entry for the 1967 version of the article) discussion of the semantics of expressions denoting parts of objects, and his suggestions for incorporating their definitions into the description of certain locative prepositions. Thus, for example, 'in front of', as in 'X (is) in front of Y', is defined by the conjunction of the markers "Z is a space", "Z is contiguous with the front of Y", "X is located internally to Z", and "X and Y are separate", where "the front of Y" is again the value of a function with an internal complexity very similar to Leech's (1969: 175) definition for 'front' (as denoting an 'extremity'). 'In back of' is defined identically except for the second marker, which would be 'Z is contiguous with the back of Y'. Symbolized, these definitions are, respectively, 1. and 2. below.

1. \( \text{Sp}(Z) \land \text{C}(Z, \text{front}(Y)) \land \text{L}(X, \text{i}(Z)) \land \text{Sep}(X,Y) \)

2. \( \text{Sp}(Z) \land \text{C}(Z, \text{back}(Y)) \land \text{L}(X, \text{i}(Z)) \land \text{Sep}(X,Y) \)

There is reason to believe that an analysis along the lines of Cooper's (however this is to be made rigorous) is preferable to that of Leech's for this particular set of expressions, as well as for the missing pair 'on the left of'/ 'on the right of'. Evidence to support this claim will be brought forward when we look at these expressions.

\footnote{\text{Sep}(\_ \_ \_ \_) and \text{C}(\_ \_ \_ \_) are relational markers symbolizing "separation" and "contiguity", respectively. Cooper gives no explanation as to why these are treated as distinct markers rather than as comple-mentaries. \text{Sp}(\_ \_ \_ \_) is apparently a marker specifying the property concept of "being a space".}
in more detail (cf. §3.3, §3.4). However, it will also be maintained that a description in terms of ordering relations is more appropriate than Cooper's for the similar set of expressions 'above'/'below', 'ahead of'/'behind', and 'to the left of'/'to the right of'.

Cooper concludes her study with informal, intuitive descriptions of five prepositions of direction. It is interesting to note that of the four additional notions introduced, but left undefined, three of these—'path(way)', 'origin-point' and 'end/terminal point'—correspond to Bennett's directional 'deep' cases (see below) of 'path', 'source', and 'goal'.

2.3. C.N. Leech's analysis of place adverbials

Leech's semantic description of English 'place' adverbials is embedded within his own particular theory of semantics and is intended as an illustration of its application to a particular semantic field. Essentially, Hallidayan in outlook, his theory represents an extension of Firth's notions of system and structure (cf. Halliday, 1961, 1966, 1967/8) to the level of semantic description. By thus being set within a general theory of language which views language as divided into levels or strata, Leech's theory of semantics is neither interpretive nor (indeed still less) generative (cf. §1.4). The former, which would involve the syntactic component being regarded as input to the semantic one, is explicitly rejected by Leech. Although he makes no mention of the generative semantic model, not surprisingly given the data of publication, this would be excluded by the "fundamental principle" of this stratificational approach that each level (phonology, form, orthography, semantics) is an autonomous subtheory in the sense that descriptive statements within
the level make no reference to units or properties defined at other
levels" (Leech, 1969: 28). We may thus describe Leech's theoret-
cal and descriptive framework as being one of 'autonomous'
semantics.

The application of Leech's model to the semantics of place
adverbials in English (as well as of temporal and modal expressions)
is very detailed, elaborate, and thorough and represents, itself, a
drawing-together and systematization of much of the previously
available knowledge of this area of meaning. The semantic field
investigated by Leech is broader than that of Cooper (1968) in that
he includes directional as well as locative relations and these as
they are realized by all kinds of adverbials (that is, not only by
prepositional phrases but by adverbial clauses and simple adverbs
as well).

However, before proceeding with the discussion of Leech's
description of spatial expressions, it is necessary to elaborate
briefly on the nature of the structural and systemic components of
his framework. The structural analysis takes, as its largest unit,
what he calls a 'predication', abbreviated as P, which is a semantic
unit corresponding, it would appear, to a proposition in logical
analysis. It consists of at most three constituents. In the case

1 It is just such an overlap in the vocabularies of syntactic and
semantic description which characterizes, in part, generative

2 He also recognizes that the meanings of some verbs incorporate
(Gruber, 1965) the meanings of prepositions; but these represent
a problem for Leech, for they "break the normal restriction that
definitions should not exceed the extent of a cluster in a main
predication" (Leech, 1969: 276, n.8).
where we have the maximum number of constituents, one of these, the 'medial element', abbreviated as \( M \), behaves as a two-place logical predicate and separates two 'terminal elements', abbreviated as \( T \), which function as its arguments (see Fig. I). The order of the

Fig. I.

\[
\begin{align*}
\text{P} & \quad \text{T} \\
\text{M} & \quad \text{T}
\end{align*}
\]

two terminal elements is determined by the properties of \( M \), which must contain a relational component (see below) intrinsically marked for 'directionality'. If \( M \) is only a one-place predicate, then the order is irrelevant. The representations for three-term and two-term predications are, schematically, \( \text{a}_1 \cdot \text{r}_1 \cdot \text{b} \) and \( \text{a}_1 \cdot \text{m} \).

It is to the elements \( T \) and \( M \) which the systemic (or componential) analysis is applicable. However, the possibilities of depredicational components and of recursion of \( P \) on \( T \) are also allowed for. That is, each of the elements \( T \) and \( M \) may consist of a cluster of unordered components (cf. Chomsky's (1965) 'complex symbol'), these components being selected from various semantic systems or being themselves derived from a predication, what Leech calls a
"downgraded" predication and symbolizes by angled brackets `< >`.  
Roughly, downgraded predications correspond, on the syntactic level, to relative clauses and to adverbial modification, such as tense or modals, which is encapsulated within the verb or verb phrase. And, in the case of a terminal element, an entire predication may take the place of a cluster (cf. Fig. II). Such a predication is said to be 'rank-shifted' and corresponds, on the syntactic level, to such constructions as sentential or de-sentential subjects, objects and complements and to sentences taking adverbial adjuncts (cf. Lyons, 1968a: § 8.1.8). Leech encloses rank-shifted predications in ordinary brackets; thus, in the formula a.r.(b.s.d), (b.s.d) is the rank-shifted predication.

1 Such components also require some mechanism of cross reference similar to that needed in generative grammar to assure that the 3 which is eventually to be relativized to a particular NP has indeed an NP 'identical' to NP — cf. Miller, 1973. Leech accomplishes this by means of a 'definite formator', 0, which "signals maximum specification or particularity of meaning" (Leech, 1969: 47), and a notational device whereby 0 and the cluster or formula having identical reference are assigned the same prime marking. Thus, the general form of a downgraded predication in a terminal cluster is a <G'b.r.o>(e.g., "a girl < who likes ice-cream") where a,b,o stand for any componential formula which does not include a relative (relational) component, here symbolized by r. Thus, "every downgraded predication within a terminal cluster has as one of its terminal elements a cluster containing the definite formator; and this formator co-refers to the remaining componential content of the cluster in which the downgrading occurs" (ibid.: 149). In the case of downgrading in a medial cluster (i.e., where the downgraded predication has an adverbial function), the definite formator co-refers to the whole of the main predication (a.r.(G'b.s.o.o.d))' (e.g., (the speaker < it having come to be > on the platform) as the semantic representation for 'the speaker is on the platform'). The round brackets for this purpose mark the extent of the unit to which co-reference is made, it being understood that the downgraded predication itself is excluded from it (ibid.: 55). However, medial downgraded predications are formally equivalent to rank-shifted predications — (a.r.(G'b.s.o.o.d))' = c.a.(a.r.d)— and the need for the former at the semantic level is somewhat questionable (having been introduced mainly for such adverbial modification as tense and modality which are manifested in surface strings, in English, within the verbal element).
Let us return now to the discussion of spatial expressions.

The relational interpretation of place adverbials is made explicit in Leech's system by means of the semantic system $\Rightarrow$PLA, a relative system functioning as the medial cluster of a predication. It takes as its first term either a componential cluster representing an object or a rank-shifted predication representing an event; its second term is a componential cluster representing a location. This accounts for the fact that both objects and events may be located in space—but only the latter situation exemplifies a true adverbial type of place relation according to Leech (cf. Lyons' (1968a: 8.1.9) discussion on locative complements and adjuncts). (Although the distinction between a cluster representing an object and one representing a location is crucial to the basic distinction which Leech makes between simple and relative position (see below), he nowhere makes explicit or precise just what differentiates the two—a problem which we will have to return to in § 3.2). The system $\Rightarrow$PLA is basic to all locative meaning in that all definitions of the adverbials are of the form $a \Rightarrow$PLA$\cdot b$.

Leech begins by establishing a distinction between static and dynamic relations, the motivation for this being the pairs of prepositions 'at/to', 'on/onto', 'in/into' and 'away from/from' in which the second member of the pair is most commonly found in the context of a verb of movement and indicates the goal or destination.
of the movement. However, since other adverbials of place can be used both in static (locative) and dynamic (destinational and/or tangential)¹ senses without a change in form, Leech does not, in fact, give different semantic representations for the static and dynamic members of each pair but instead characterizes the difference as one of 'grammatical concord'² determined by the presence or absence of a dynamic context (cf. Lyons, 1968a: §8.4.7; Anderson, 1971b: §8; Bennett, 1972), this latter being represented semantically as a higher inceptive predicate.

A more fundamental distinction in Leech's framework is that which he makes, within the semantic field of spatial relations, between simple and relative position. Simple position is encoded by such prepositions as 'at', 'on', 'in' and is a spatial relation

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¹ 'Tangential' meaning is the closest counterpart to 'path' in Bennett's framework: "it implies that the course the moving object takes is firstly towards, then away from, the stationary object or location" (Leech, 1969: 196). "They marched in front of the barracks may thus be construed in three different ways: (a) they started elsewhere and ended up in front of the barracks (destinational); (b) they passed in front of the barracks on the way to some other destination (tangential); (o) they started and ended in front of the barracks (static)" (ibid.: 197).

² "That is, go, run, walk, etc. are classified syntactically as "motional verbs" and to, on(to), in(to), from, etc. as "motional prepositions" (cf. Gruber, 1965: 83) although they receive the same definitions as the "non-motional" prepositions at, in, on, etc. The rule which forbids the co-occurrence of "he stood to the door, he is crouching into the chair is a purely syntactic rule which decrees that motional prepositions should be preceded by motional verbs" (Leech, 1969: 193, n.b). Wirambel (1950: 153) sees the grammatical concord working in the opposite direction: "dès lors, on ne peut plus parler du rapport entre la préposition et la forme casuelle, mais du rapport entre la préposition et le verbe, qui, lui, exprime la station ou le mouvement. En pareil cas, le sens de la préposition, et éventuellement (en anglais) la forme de la préposition, se trouvent déterminés par la valeur du verbe."
between an object and a location, that is, between non-comparables. It is represented simply by the system $\rightarrow \text{PLA}$ (along with an 'ascription' feature—see below). Relative position, on the other hand, is a spatial relation between two objects and is encoded by most of the other prepositions (for example, 'with', 'beyond', 'in front of'/'behind', 'past', etc.). The two objects are spatially related only through the mediation of their (simple) locations, which may be identical ('with': "at the same place as") or distinct ('beyond', 'past', 'in front of'). Given the basic formula $a \rightarrow \text{PLA} \cdot b$, relative position involves a downgraded predication within $b$. To take the simplest example, the meaning of 'a is with b' is represented as in 3:

3. $a \rightarrow \text{PLA} \cdot \varnothing' \langle \theta' \leftarrow \text{PLA} \cdot b \rangle$ 'a at the place at which b'

Let us take a somewhat more complex example, that of the pair 'in front of'/'behind'. The formal representation for 'a is in front of b' is given in 4:

4. $a \rightarrow \text{PLA} \cdot \varnothing' \langle \theta' \rightarrow \text{SID} \rightarrow \text{VER} \rightarrow \text{PRI} \rightarrow \text{PLUS} \langle \theta' \leftarrow \text{OBS} \cdot \theta \rangle \cdot \varnothing' \langle \theta' \leftarrow \text{PLA} \cdot b \rangle$  

1 $\varnothing$ is a dummy element. $\rightarrow \text{SID}$ is a relative system basic to all relative position other than identity of location or spatial 'togetherness', encoded by 'with'. It can be interpreted as "to the side of". Once one extends the analysis beyond this 'archirelation' to more complex relations, it becomes obvious that some type of vectorial framework is required for their description. And also, that this same vectorial framework, essentially a subjectivized three-dimensional system, is the same as that underlying the use of scalar adjectives such as 'long/short', 'wide/narrow', 'high/low' (cf. Teller, 1969; Bierwisch, 1967 (for German)). Thus, Leech sets up a three-dimensional system differentiating the vertical axes from the horizontal ones by the binary system $\rightarrow \text{VER}$ and the primary horizontal axis (as pertinent in 'in front of'/'behind) from the secondary one (as pertinent to 'to the left of'/'to the right of') by the binary system $\rightarrow \text{PRI}$. $\rightarrow \text{PLUS}$ is an ordering relation applicable to each of the three axes. $\rightarrow \text{OBS}$ may be rendered as "is the point of observation for".
Leech ((1969: 66) states that expressions of the form 'a (is) at a place which is, with respect to the primary horizontal axis (and as seen from Q), to the positive side of the place at which (is) b', or, more roughly, 'a (is) at a place which, with respect to the primary horizontal axis, is closer to Q, the point of observation, than (is) the place at which (is) b'. The definition for 'behind' would be the same as for 'in front of' except for the substitution of $\leftarrow$ PLUS for $\rightarrow$ PLUS, i.e., the two locations, $\emptyset$ and $\emptyset''$, are given the opposite order.

The formal properties upon which Leech bases the distinction between simple and relative position are (1) that expressions of the former lack converses (cf. Lyons, forthcoming § 8.3) and (2) that they may impose subjective properties upon the location (i.e., upon $b$ in $a \rightarrow$ PLA $b$). Leech deals with this last property, which in part corresponds to the perceptual/conceptual interpretation of Cooper's functions ($i(x)$, sur($x$)), by arguing for a type of selectional restriction which is weaker than the Chomskyan kind and which is based upon what he calls 'ascription' features. These features "do not actually form part of the componential content of the adjacent terminal cluster, but are rather matched against its content, such that co-occurrence with a systematically contrasting component is marked as a violation" (Leech, 1969: 66) and are such that if the terminal cluster contains no inherent feature specification for the

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1 Thus, for example, whereas we have John is to the left of Mary $\equiv$ Mary is to the right of John, The post office is beyond the house $\equiv$ The house is on this side of the post office, there exist no converse expressions for John is at the post office, John is in London.
particular ascription system involved, then in that particular context its referent is subjectively assumed to have the same specification as the preceding ascription feature. Whether this phenomenon could be equally well described by means of ordinary selectional restrictions (cf. J. Geis, 1970) with the additional notion of 'transfer' features (cf. Weinreich, 1966; Bierwisch, 1967) will not be discussed here. We will have more to say later on (cf. §3.2) about the relative merits of this approach over other alternatives, including Cooper's. What is of present concern is the psychological or subjective property of the interpretation of these features.

Leech observes (1969: 65), following a study done earlier by Catford (1959), that "English locative prepositions are divisible into groups according to the "dimensionality" they attribute to the reference of the following nominal. At, to, from indicate an absence or irrelevance of spatial dimension...on, onto, off suggest a line or a surface...in, into, out suggest an area or volume. The choice of the preposition does not reflect the actual dimensional properties of the object of orientation, but rather the way it is imagined by the speaker."¹ To account for these observations, Leech sets up a multiple taxonomic system of ascription features dealing

¹ This is not the first time that such phenomena have been observed and so interpreted. Concerning the French counterparts to the English prepositions 'on' and 'in', namely 'sur' and 'dans', Gougenheim (1939: 310) observed that "pour un certain nombre de concepts spatiaux, la répartition de dans/en et de sur dépend moins de la forme réelle de l'espace que de la conception que l'on se fait, conception commune, en général, à l'ensemble des sujets parlants, mais susceptible, à l'occasion, de variations, et qui a effectivement varié dans le temps" (Gougenheim, 1959: 8). Later, in another article, he remarks that "À marque que le lieu n'est envisagé que comme un point dans l'espace, sans considération de surface ni de volume" (Gougenheim, 1949; Pottier, 1962: 129. For other observations on the meanings of these prepositions, see Hjelmslev, 1935; Collinson, 1937; Fahlin, 1943; Lindkvist, 1950.
with subjective dimensionality: [1 DIME] indicates that no dimension of the location is relevant, [2 DIME] that a one or two dimensional surface is relevant, [3 DIME] that a two or three dimensional enclosure is relevant. These features, being subjectively ascribed to the location, are associated not with the terminal cluster representing that location, but rather with the medial cluster. Thus, the definitions given to 'at', 'on', and 'in' are, respectively,

→ PLA [1 DIME], → PLA [2 DIME], and → PLA [3 DIME].

Explicit considerations of deixis appear at two points in Leech's study of place adverbials: in his description of the deictic adverbs 'here' and 'there', which he analyzes as "at this place" and "at that place", respectively; and in his discussion of the points of observation and orientation occurring in the definitions of expressions of relative position, both of which, if unspecified, are most generally interpreted deictically (that is, in relation to the location of the speaker). Leech deals with such deictic elements of meaning by the system THIS which "cannot occur except in the presence of the definite formator Θ, in combination with which they have a referential DEIXTIC or "pointing" function. They may "point" co-referentially

1 It seems rather curious to include a feature [1 DIME] equivalent to 'no dimension relevant' and equipollent to [2 DIME] and [3 DIME]. Rather, the usage of 'at' would suggest, if this type of analysis is followed, that it is unmarked for DIME—cf. §3,2.

2 Although Leech is not absolutely explicit about the distinction between the two, the point of observation appears to be the vantage point with respect to which the ordering relation involved in the expression of relative position is given a direction (or 'polarization'—cf. §3.4). The point of orientation, on the other hand, appears to be the object to be located with respect to which the ordering relation is again given a direction.
to other parts of the discourse in which they are used, or may have extratextual reference to something near or remote in the speech situation. In conjunction with THIS or.THIS, the reference of the definite formator (is taken to be self-explanatory by appeal to context" (Leech, 1969: 109-10). That Leech finds it impossible to provide a non-context-dependent characterization of THIS and his system THIS is in accordance with the principle maintained in Lyons (forthcoming: 484) to the effect that "deixis imposes certain limits upon the possibility of de-pragmatizing linguistic semantics." It is nevertheless possible to develop a pragmatic system for the use of deictic expressions, and Atkinson & Griffiths (1973) have made a first step in this direction. Although our central concern will not be with deictic meaning, or especially with its representation and formalization (both of which involve numerous problems and complexities—cf. Lyons, 1973; Atkinson & Griffiths, 1973), it plays an extremely basic and pervasive role in the field of spatial specification.

2.4 D.O. Bennett's observations concerning the locative-directional distinction

Bennett claims that an adequate treatment of the semantics of spatial expressions involves the recognition of four semantic ('deep') cases (cf. Fillmore, 1968) which he labels 'locative', 'source', 'path' and 'goal'. The last three of these he also considers as representing the three phases of any movement through space. A

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1 The term 'expression' is being used here in its more usual sense of formally (lexically and/or grammatically) determined stretches of language (cf. Lyons, forthcoming: 21; Leech, 1969: 31). Bennett employs it for underlying semantic structures—see below.
further basic distinction is made between locative and directional predicates, interpreted as the more concrete manifestation of the static/dynamic opposition (as in Lyons, 1968a: 300). The former contains, in the underlying representation, an instance of the element LOCATIVE; the latter contains one or more of the elements SOURCE, PATH, and GOAL. Bennett is interested, therefore, in both locational and directional relations at the level of content; and although his investigation centres mainly on these relations as they are realized by prepositional phrases, he recognizes the need for accommodating the fact that "a directional expression...may be realized partially, or even entirely, in the verb of a sentence" (Bennett, 1972: 71). As far as the scope of his study is concerned, the actual range of expressions considered by Bennett is less comprehensive than that of Leech.

Bennett eventually formalizes his observations within the stratificational model (cf. Lockwood, 1972; Sampson, 1972), giving both a fragment of the semotactics for this particular semantic field (that is, the possible structural arrangements of the sememes, or semantic components, these including the four cases as well as ones representing objects and parts of objects) and a fragment of the

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1 Presumably, Bennett would wish to include here locative expressions as well. He also mentions the possibility of spatial relations being realized within nouns: "The noun interior is merely one realization of 'interior'. When combined with other semological elements, 'interior' may be realized in such lexemes as the preposition/adverb in, and the verbs enter and contain" (Bennett, 1972: 68).
semolexemic network (that is, the realization relationships between
sememic configurations and lexemic (syntactic) ones). However, he
does not accord very much importance to the formalism adopted, being
more interested in an accurate presentation of the data. Neverthe-
less, his ambivalence towards the systemization of his observations
and, in particular, the alternation between the more informal dis-
cussion of underlying representations in terms of deep cases and the
later formalization in terms of the semotactics is a serious draw-
back. Furthermore, the underlying representations which he assigns
to the spatial expressions are far from explicit or unequivocal;
they can be regarded only as rough and abbreviated approximations.
This short-coming will be demonstrated in the following discussion.

Bennett establishes a two-parameter classification of spatial
expressions according to their semantic structure in the following
way. He first assumes "that 'locative', 'source', 'path', and
'goal' are elements occurring in the underlying representations (URs)
of English sentences.... Wherever one of the four elements occurs,
it is directly in construction with some other constituent..., which
indicates the nature of the particular location, source, path, or
goal. We will use the term 'spatial expression' to refer to such
binary constructions. Spatial expressions are thus of four kinds,
for which we may employ the labels: locative, source, path and goal
expressions. The element 'locative' of a locative expression, the
element 'source' of a source expression, and so on, represent the
function in sentences of the four kinds of spatial expressions. For
this reason 'locative', 'source', 'path', and 'goal' may be thought
of as ('deep') cases" (Bennett, 1972: 59-60).

The second classifying parameter is that of the degree of
complexity of the second constituent of these binary constructions. The simplest class, that of 'locative expressions', involves expressions whose first constituent is the case LOCATIVE and whose second constituent represents either an object or a part of an object. Thus, for example, we are given the following semantic descriptions (UR's) for the spatial expressions in 5. and 6:

5. at the post office  UR:  LOCATIVE (POST OFFICE)
6. in the post office  UR:  LOCATIVE (INTERIOR (POST OFFICE))

Bennett uses the parentheses to indicate constituency. However, the URs given above do not, on the usual interpretation of constituent structure, represent a two-constituent construction, in which case ((LOCATIVE)(POST OFFICE)) and ((LOCATIVE)((INTERIOR)(POST OFFICE))) would be more appropriate. Rather, his URs would appear to be closer to dependency structures, the second element being governed by the first. Such an interpretation would, perhaps, not be incompatible with Bennett's intentions since his characterization of 'spatial expressions' would seem to imply a binary structure in which the first constituent, the deep case, is also the label of the construction. This is formally equivalent to a dependency structure with the case (label) governing the second element (cf. Robinson, 1970; Anderson, 1971a). It is only if such a re-interpretation of Bennett's formalism is valid that his analyses can be considered to be a functional and hence (implicitly) relational one (cf. Anderson, 1971b: 27-31).

However, there are further problems with Bennett's representations in that, regardless of the interpretation given to the bracketing, the relationship between the two elements (constituents) is not
the invariable one which it ought to be. Thus, whereas POST OFFICE and INTERIOR (POST OFFICE) both represent some kind of object-like entity, the same is not true of POST OFFICE and LOCATIVE (POST OFFICE). The latter represents something like an incompletely specified relation (i.e., we do not know what element LOCATIVE depends on). That is, whereas INTERIOR(X) is interpretable only as a function (cf. Cooper's i(X) in § 2.2) such that INTERIOR (POST OFFICE) is the (unique) value of the function when operating on POST OFFICE, LOCATIVE(X) is simply a relation. This discrepancy would be tolerable if it were consistent, that is, if one could predict the desired semantic relationship between the two elements according to whether the first was a case or some other class of sememe. However, this is not the case, as becomes evident when considering the three other classes (on this second parameter) of spatial expressions.

More complex than locative expressions are directional expressions which consist of one of the directional cases as first constituent and a locative expression as second constituent. For example, the path expressions corresponding to the locative expressions in 5. and 6. above are as follows:

7. via the post office \[ \text{UR: PATH (LOCATIVE (POST OFFICE))} \]
8. through the post office \[ \text{UR: PATH (LOCATIVE (INTERIOR (POST OFFICE)))} \]

Here we are again in serious difficulty. Not only is it unorthodox to have embeddings of cases such as PATH (LOCATIVE( )), but also the interpretation of the embedded locative expression must now be something quite different from what it was in the instances discussed above, where it was not embedded.
This becomes even clearer in the third and fourth classes of expressions. 'Locative-directional' expressions are locative in function (i.e., the first constituent is LOCATIVE) but their second constituent is now a directional expression. However, it is obvious that this locative expression can no longer be interpreted as representing a semi-specified relation, which it does in isolation, but as representing various effects of a journey of some sort. Compare, for example, the underlying representations given for the underlined phrases in 9. and 10. below.

9. Harry lives over the hill
   UR: LOCATIVE(PATH(LOCATIVE
   (SUPERIOR(HILL))))

10. Harry lives past the post office
    UR: LOCATIVE(PATH(LOCATIVE
    (PROXIMITY(POST OFFICE))))

Bennett glosses 9. as "the location that one would reach [by travelling via [the location [directly over [the hill]]]]." (The square brackets have been inserted to show which parts of the gloss (roughly) correspond to the various constituents of the underlying representation.) The segment of the gloss corresponding to LOCATIVE(PATH illustrates not only the point at hand, but also the difficulty encountered by any proposal to treat PATH as an atomic sememe.

The fourth class of spatial expressions are '(directional-locative)-directional' expressions which are directional in function (i.e., the first constituent is SOURCE, PATH or GOAL) but whose second constituent is a directional-locative expression, rather than a simple locative one. An example is given in 11. below. Again, the complicated gloss for this structurally simple UR, something like
John ran to beyond the post office.  

UR: GOAL(LOCATIVE(PATH (LOCATIVE(POST OFFICE))))

"having as goal [the location which can be reached [by taking a path leading via [the intermediate location [at the post office]]]],"

illustrates the full range of problems involved in Bennett's notation: constituency is not the relevant structural relationship, case sememes have no standard or constant interpretation, and considerable amounts of de-propositional information (relating to 'journeys'—see below) is left implicit. Further, such sememes as INTERIOR, SUPERIOR, PROXIMITY surely do not belong to the same class of elements (Bennett calls them all parts of objects).

Despite the rather negative remarks made so far, Bennett's study—once it is regarded as more intuitive than formally explicit—is full of keen observations and insights. In particular, he gives a very useful discussion of polysemy in terms of his four-way classification according to the internal complexity of the spatial expression (although, as we have seen, the relationship between the various uses will be more complex than simple recursion on the case node). For example, he assigns to 'over' the underlying representation LOCATIVE(SUPERIOR( )) since such components of meaning are always present whenever it is used. Other contextually determined elements such as PATH and GOAL are "realized as zero". Thus, "the ambiguity of a sentence such as (76) The helicopter is over the hill depends now not on the fact that over has two locative senses, but on the

1 At the most, one could say there are cases of two types: those which do not depend on another case and those which do—and these two types have very different interpretations.
I fact that a single surface structure may realize either a simple locative or a directional-locative expression" (Bennett, 1972: 76-7).

He is also able to bring out the parallelism between such sets of non-identical expressions as 'at'/via/to' and 'in'/through/into'. The first member of each set has a locative function, the second member a path function and the third member a goal function.

The only difference between the two sets is therefore, in Bennett's system, the presence of INTERIOR in the latter but not in the former. Another interesting aspect of his analysis is the discussion of the set of verbal expressions 'go to', 'arrive at', and 'reach'.

Granted that each of these includes in underlying representation the segment GOAL(LOCATIVE( )), 'arrive' can be viewed as incorporating GOAL in its realization, 'reach' as incorporating both GOAL and LOCATIVE.

Bennett also introduces a deictic element into his analysis which corresponds in function to Leech's points of observation and orientation: "During the discussion of directional-locative expressions..., it was pointed out that the speaker's reference point represents the beginning of the path leading to the location specified by the directional-locative expression; and also that it may be overtly specified by the directional-locative expression" (Bennett, 1972: 81). He represents this reference point in UR by means of a source expression, SOURCE(LOCATIVE( )), conjoined to either the path or goal expression functioning as the second constituent of a directional-locative expression.

That Bennett's study is independent of Leech's but significantly congruent with it, both in this latter respect as well as in his observations on and analyses of polysemy (cf. Leech's 'locative',
'destinational' and 'tangential' meanings of 'in front of' (cf. fn. 1 p. 30) supports the validity of the distinctions made in both. Where both analyses expose their major weakness, however, is in the description of directional expressions in which an explicit and precise characterization of a 'journey' is lacking, even though the notation is extensively presupposed. Without such a construct, the notations of 'source', 'path', 'goal' or 'destinational', 'tangential', 'resultative' remain only intuitive and unrelated, both notionally and formally.
3.1 General remarks on spatial expressions and spatial relations

In the preceding discussion, the terms 'spatial expression' and 'spatial relation' have been used as broad, intuitive cover terms. In this and the following sections, we shall try to distinguish between various kinds of spatial relations and their characteristic realizations.

The basic distinction which has been made in the past and which is maintained here is that between a location and a direction, i.e. between a locative (locational) and a directional relation. Correspondingly, we have the distinction between locative and directional expressions. A location is a place; a locative relation pairs an object with a place. A direction is an orientation; a directional relation spatially orders two objects, two places, or an object and a place with respect to a third object or place. Let us illustrate these distinctions. Sentence 1. below expresses a locative relation

1. The letter is on the top of the filing cabinet

between the object identified by 'the letter' and the place identified by 'the top of the filing cabinet'. Sentence 2., on the other hand, expresses a directional relation between the object identified

2. John is sleeping with his head towards the mouth of the cave

by 'his head' and that identified by 'the mouth of the cave'. More specifically (but less generally than necessary), it specifies that John's head is spatially ordered before the mouth of the cave with
respect to a third object, which, in this case, is (plausibly) John's feet. 1 To say that objects are spatially ordered is to say that it is their physical locations which are ordered. Thus, a directional relation defined on objects involves the implicit pairing of objects with places and to this extent is a (complex) locative relation.

Let us look somewhat more closely at locative expressions and their sub-types. We will establish a distinction between a 'reference object' and a 'location object', and this will lead us into a three-way classification of locative expressions according to whether they express 'direct' location, 'semi-direct' location or 'indirect' location. This latter will be found to subsume static directionals.

The location object is the place paired with an object by a locative relation, i.e., it is the region functioning as the location of an object. Thus, in 3. below, the region identified by 'the end of the street' is the location object with respect to the telephone box, the object being located. Moreover, it is also the reference object, by which we mean that of the two entities denoted by the noun phrases in 3. (the subject noun phrase and the noun-phrase complement

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1 Note, however, that the situation denoted by 2. is compatible with John being either inside or outside the cave. The difference between these more fully specified situations is one which Black (1959) has called a difference of 'arrangement'. We will come back to the distinction between 'order' and 'arrangement' in our discussion of the expression 'between'.
of the locative preposition) it is the one which for discourse or other reasons has been chosen as belonging to the reference world or the background universe, a three-dimensional map to which other objects are referred. That it is very often a matter of choice which object is taken as the reference object is illustrated by the sentences in 4, and 5. The locative relations expressed by the two sentences are logically equivalent but not linguistically identical:

4. The cottage is between the two oak trees
5. The two oak trees are (one) on either side of the cottage

for either thematic reasons (information structure of the discourse) or because of perceptual/conceptual factors (and these two may not be independent of each other), the two trees denoted in 4, are taken as reference objects, whereas in 5, it is the cottage which is singled out as belonging to the reference world. As a further illustration, we may repeat Gruber's (1965: 34) pair of sentences, given as 6. and 7. In 6, the circle is the reference object; in 7, it is the dot.

6. The dot is inside the circle
7. The circle is around the dot

A direct locative expression is therefore one in which the object identified by the complement of the locative preposition functions as both the location object and the reference object. We will return to a discussion of these and the validity of the category in the immediately following section. For now, we will grant that such expressions exist and, more particularly, that the prepositions 'at', 'on' and 'in' denote direct locational relations (cf. Leech's (1970) notion of simple position discussed in §2.3). We can symbolize
the relation as in 8. below, where \( X \) is the object to be located

8. \( X \text{ LOC } Y_{1+r} \)

(the 'theme' in Gruber's terminology), \( \text{LOC} \) is the relational element (which we may want to further specify), and \( Y_{1+r} \) is both the location and reference object.

Let us now consider cases in which this coincidence of location and reference object does not exist. First, we observe that many objects have an intrinsic orientation. For the moment we can correlate this property with the existence of extremal portions of the object which can be referred to by such expressions as 'front', 'back', 'top', 'bottom', etc. Thus, for example, humans, cars and houses have fronts and backs and, along with bottles and flag poles, have tops and bottoms. A detailed discussion of the exact nature of the 'rules of application' (cf. H. Clark, 1973) for these expressions will be left for later. For now, we want simply to note that any such extremity of an object can itself define another object (a spatial region), and this latter can then function as the location object in a locative relation. The fact that a house, for example, has a front and a back allows the definition of spatial regions characterized (at least in part) by their being contiguous with one of these extremities. It is these regions which function as the direct location of John and Mary in sentences 9. and 10. below. They can be glossed roughly as "John is in the region contiguous with"

9. John is in front of the house

10. Mary is in back of the house

the front of the house" and "Mary is in the region contiguous with... the back of the house", respectively. Here, the reference object is,
in both cases, the house: the location object, on the other hand, is a spatial region defined with respect to an extremity of the house. Such expressions as 'in front of'/'in back of' we will call semi-direct locatives, and they participate in the expression of semi-direct locational relations. We may give as a general symbolization for such relations that of 11. Again, X is the object to be located, loc the relational element, and Y_r the reference object. EX( ) is a particular extremity of the object which is its argument, and SR( ) is the spatial region defined with respect to its argument. Thus, the whole of SR(EX(Y_r)) is the location object in the locative relation. Because of the intrinsic relationship between the reference object and the location object in such cases as these, we may call Y_r the 'secondary' location object.

Finally, we have the situation of a locative relation between objects neither of which is a location object nor a secondary location object. However, one of the two objects is still regarded as the reference object. Since neither object is the location of the other, the object to be located is located indirectly by means of specifying an ordering relation between its unspecified direct location and that of the reference object with respect to a third implicit or explicit location in the situation being described. This is what we intend by the term 'indirect location' and we will symbolize it as in 12., omitting for now the third location. L(X) is the direct location of X (i.e. L(X) =_def ( Z)(X loc Z)) and similarly for L(Y_r). Ord is an ordering relation which would be further specified
for polarity according to the particular expression involved. However, since 12. makes indirect locational relations appear radically different in form from the others, we can use the alternative representation in 13. (cf. Leech's 'relative position', discussed in

13. $X \text{ loc } (\eta Y)(Y \text{ ord } (\iota Z)(W \text{ loc } Z))$

$(\exists Y)(X \text{ loc } Y \land Y \text{ ord } (\iota Z)(W \text{ loc } Z))$

§2.3.). Thus, for example, sentence 14. below can be glossed (roughly) as "the location of Tom's balloon is higher than the location of Mary's balloon (which is higher than the (location of the ground)".

What emerges from this discussion is that no matter which kind of locative relation is involved, the object to be located can be regarded as always entering into a direct locative relation—either with the reference object or with a region defined with respect to an extremity of the reference object or with an unspecified location object which is in an ordering relation with the location of the reference object.

3.2 Direct location: 'at', 'on' and 'in'

We have given as a schematic characterization of direct location the formula in 15., which is to be read as "X's location is Y".

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1 We have provisionally used the eta-operator here (cf. Reichenbach, 1965: 265) as an expository aid since "it corresponds more closely to the usage of conventional language". Leech's use of a dummy element '∅' (cf. §2.3) would appear to correspond in some respects to the eta-operator. We have given the definitionally equivalent and less controversial representation as well. 12. (containing two iota-operators and hence a uniqueness clause for each location) is equivalent to 13. (lacking the uniqueness clause for the first location) by virtue of the basic axiom that an object has only one location at any moment in time.
Although we have not discussed the precise nature of \( Y \), we have suggested that the prepositions 'at', 'on' and 'in' participate in

\[ X \text{ loc } Y_{1+r} \]

the realization of such a formula as that in 15. Examples are given in 16. to 18. below.

16. a. John was standing at the bus-stop when I met him
   b. Mary is at the cinema
   c. The conference was held at the White House

17. a. The matches are on the table
   b. The players are on the field
   c. John was skating on the frozen pond

18. a. We left the car in the parking lot
   b. There's some sugar in the jar
   c. The child pouted in the corner of the room

If the characterization in 15. is appropriate for these sentences and if \( Y_{1+r} \) is the object denoted by the noun phrases following 'at', 'on' and 'in', then the differentiation of the meanings of these three prepositions must reside in a further specification of the relation holding between \( X \) and \( Y_{1+r} \). This is the approach taken by Leech in his use of ascription features, the nature of which we have discussed in §2.3. Let us explore the consequences and viability of such a position in somewhat greater detail.

According to Leech's analysis, these three prepositions are equivalent in meaning except for an equipollent contrast of ascribed dimensionality in the medial cluster, this being made explicit in his set of definitions ('at': \( \rightarrow \text{FLA}[1 \ \text{DIME}] \); 'on': \( \rightarrow \text{FLA}[2 \ \text{DIME}] \); 'in': \( \rightarrow \text{FLA}[3 \ \text{DIME}] \)). However, there are two problems here which
would suggest that 'at' is not on a par with 'on' and 'in'. First, there appears to be some equivocation in the intended interpretation of the feature 1 DIME. Sometimes Leech renders this feature as "no dimension relevant", in which case it would be more appropriate to say that 'at' is unmarked with respect to the system DIME; and sometimes he glosses it as "perceptually a point", in which case such an equipollent assignment of feature values may be appropriate. That is, the distinction is lost, in such a formulation, between an expression being unmarked for subjective dimensionality and being marked for subjective dimensionlessness. Such a distinction, or one similar to it, is involved in an adequate account of the semantics of 'at' in all its complexities—which Cooper, Bennett and Leech can hardly claim to have covered. (Even a cursory glance at the thorough corpus-based study of Lindkvist (1950) will convince one that there is more to 'at' than meets the eye.)

Related to this is the problem of distribution: 'at' appears to be marked with respect to what noun phrases can function as its object. And it is significant that Leech, in his discussion of the

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1 It may be argued that Leech does in fact make implicit use of the distinction of marked versus unmarked with respect to this system. In the analysis given for expressions of relative position, the definitions are based on $\text{F}_1\text{PLA}$ without a DIME ascription feature and such parts of the definitions are glossed as "at (the/a place...)". Thus, in discussing 'with' ("at the place at which") he states (1969: 165) that "like other prepositions of the same kind, it is neutral with respect to dimensionality, and no ascription feature is therefore included in its definition". However, it becomes very difficult to find the distinction between 'neutral with respect of dimensionality' and his interpretation of 1 DIME as 'no dimension relevant'. Furthermore, such an omission of a DIME feature is specifically excluded by the contextual properties given for the system $\text{F}_1\text{PLA}$ which require that it be accompanied by DIME.
("clear mental") difference between the terminal cluster corresponding to the object to be located and that corresponding to the location object, cites only an example involving 'at'. Thus, to use Leech's examples, 19. is acceptable whereas 20. is not. However, as we

19. John is at the house
20. The house is at John

noted above (§2.3), Leech's definition of 'at' (and 'on' and 'in') is such that it will not exclude 20. The contextual restrictions on each terminal cluster are the same (if we consider only object-place relations rather than situation-place relations as well), namely, that they be +COND. It is not possible, as Leech would appear to suggest, to avoid generating 20. by merely assigning the logical property of asymmetry to PLA: "Calling the system 'place' asymmetric amounts to saying that in any relation a → PLA c the entities designated by a and c cannot be interchanged, despite their sharing of a common feature +COND" (Leech, 1970: 160). The reason for this is that although there is no doubt some connection between the logical properties of a predicate—symmetry, reflexivity, transitivity, etc.—and the co-occurrence restrictions between a predicate and its arguments, the first has to do with truth, the second with well-formedness. To take a different example, the relational predicate 'is the father of' is asymmetrical, and hence both 21. and 22. cannot be true (given that 'John' and 'Fred' identify the same

21. John is the father of Fred
22. Fred is the father of John

individuals in both sentences). However, they are both well-formed, syntactically and semantically, since the co-occurrence restrictions
on the two arguments are the same. Thus, asymmetry will not be sufficient to rule out 20.

To see that 'at' is distributionally more restricted than either of 'on' or 'in', we observe that many noun phrases denoting ordinary objects such as a cigar box, a book, a desk, a briefcase, can function as the object of 'on' and 'in' but not of 'at'—compare the sentences in 23. It is unlikely that 23.a. could be excluded by means of a

23. a. John's letter is at the cigar box/desk
   b. John's letter is on the cigar box/desk
   c. John's letter is in the cigar box/desk

systemic contrast of 1 DIME with an inherent feature of 'cigar box' or 'desk' since it would be very difficult to motivate the inclusion of such a feature (presumably 2 DIME or 3 DIME)\(^1\) in the definition of these but not, say, in that of 'post office'—witness the acceptability of 24.

24. The letter is at the post office

\(^1\)This represents perhaps another difficulty with Leech's DIME ascription features; complete incompatibility is said to occur if, when the ascription feature is matched against the content of the terminal cluster, there is found to be a systemically contrasting component. However, the examples of violations given by Leech—*in this point on the map* and *in the finishing line*—involve features from two systems: the DIME ascription system (where we are dealing with subjective dimensionality) and with a DIM (cf. Bierwich, 1967) system which is involved in characterizing the spatial properties of objects and extensions of objects, and there is no necessary correspondence between these two systems. To predict the semantic violations above, Leech would have to posit a set of incompatibility rules between features of two systems such as: 3 DIME is incompatible with 0 DIM.
What we want to keep in mind, therefore, in the following discussion is (1) the possibility of a marked and an unmarked use of 'at' with respect to the contrasting pair of 'on' and 'in' and (2) the possibility of further characterizing the contexts in which 'at' may occur, particularly with respect to the two objects involved in the locative relation. We cannot hope to survey the entire range of data involved (cf. Lindkvist, 1950), but we will attempt to make a few generalizations concerning the major semantic (and pragmatic) facts which must eventually be taken into account in an adequate description of these three prepositions.

If we compare the sentences in 25., we observe that while the b. and c. sentences are inconsistent with each other, neither of them

25. a. Fred is waiting for Joan at the post office
    b. Fred is waiting for Joan in the post office
    c. Fred is waiting for Joan right by/just outside the post office

is, on its own, inconsistent with the a. sentence. In fact, each of b. and c. imply a. The same is true of the sentences in 26. and 27., but here contextual or pragmatic considerations tend to rule out

26. a. Our summer-cottage is at Lake Windemere
    b. Our summer cottage is in Lake Windemere
    c. Our summer cottage is right by/right adjacent to Lake Windemere

27. a. They have prohibited fishing at Sylvan Lake
    b. They have prohibited fishing in Sylvan Lake
    c. They have prohibited fishing right by/right adjacent to Sylvan Lake
one or the other of b. and c. as a possible, more specific, alternative to the a. sentence. For example, 26.b. is semantically well-formed but the situation it describes would no doubt be tragic. A similar phenomenon occurs with 'on' and 'right by'/'right near'. In 28., each of b. and c. (which are mutually inconsistent) implies a. In 29. and 30., pragmatic features again make one of b. and c. unlikely.

28. a. John's at the curling rink
   b. John's on the curling rink
   c. John's right by/right adjacent to the curling rink

29. a. Brewster built a lodge at Lake Maligne
   b. Brewster built a lodge on Lake Maligne
   c. Brewster built a lodge right by/right adjacent to Lake Maligne

30. a. Water-skiing is prohibited at Loch Tay
   b. Water-skiing is prohibited on Loch Tay
   c. Water-skiing is prohibited right by/right adjacent to Loch Tay

1 This sentence may be acceptable but it then has the interpretation "on the shores of", i.e. that of 29.c. This pragmatic selection also occurs with 'in'—cf. the sentences below.

1. There are many boulders on this road
2. There are many petrol stations on this road
3. There are many cars in this street
4. There are many Georgian houses in this street
Thus, what we appear to have is a hyponymic relation between 'at' as superordinate and 'in', 'on' and 'right by'/'right adjacent to'\(^1\) as co-hyponyms, and 'at' could be regarded as unspecified with respect to the features distinguishing the three co-hyponyms from each other.

However, let us next consider the following sets of sentences.

31. a. The children are standing at the fire
    b. The hysterical woman is standing in the fire

32. a. There's a boot-scraper at the door
    b. There's a boot-scraper on the door

33. a. John is sitting at the counter
    b. John is sitting on the counter

34. a. The dog is at the window watching for his master
    b. There's a crack in the window
    c. There's a spider on the window

35. a. Fido is sitting at the piano
    b. Fido is sleeping in the piano (e.g. an open grand piano)
    c. Fido is sleeping on the piano

Here we have 'at' in contrast with either 'in' or with 'on' or with both. Consider too the different interpretations of 'at' in the sentences in 36. Under the most natural interpretation of 36.a., the

36. a. A newspaper photographer is standing at the finish line
    b. The last runner is finally at the finish line

photographer is standing at one or the other ends of the line. In

\(^1\) This pair may more appropriately be called quasi-hyponyms of 'at' (cf. Lyons, forthcoming: §8.4). However, the inclusion here of 'right by'/'right adjacent to' is only provisional—see below.
36.b., on the other hand, the runner is just about to cross the line or is actually crossing it. We see here, as well as in 34. to 36., how pragmatic information is involved in determining the interpretation of these sentences. And we can propose as a pragmatic principle that the more unlikely it is that 'in' or 'on' could be substituted as a hyponym for 'at' in a particular context, the more likely it is that 'at' will take on a marked interpretation and, rather than being superordinate to 'in' and 'on', will be in contrast with them. The pragmatic considerations which determine whether a marked interpretation of 'at' is involved are no doubt of a diverse nature, and it is by no means clear how one could formulate them. However, many of them appear to derive in quite a straightforward manner from the repeated observations of various physical laws or phenomena, such as that fire consumes what is in it, that most objects do not remain on the surface of bodies of water but tend, rather, to sink, and that few objects can support themselves on or adhere to a vertical surface. In addition, many objects normally involving a particular use, manipulation or operation by humans—such as desks, pianos, typewriters, counter, windows—are generally confronted by their operators or users in a conventionalized way having to do with their physical structure.

The marked interpretation of 'at' appears to involve not only some element of proximity or adjacency to the limits of the location object—which, if not itself a border or barrier of some sort, represents some kind of obstacle or impenetrable substance to the object being located—but also an element of confrontation or immediate juxtaposition. This is the interpretation in all the a. sentences in 34. through to 36., as well as in one reading of 36.b.
(but note that the confrontation is from a different direction to that in 36.a.). This same element of meaning is also conspicuous in the sentences in 37., and if we were to substitute 'near' or 'by'

37. a. The postman is at the door
b. The gardeners are talking at the fence
c. We had to show our passports at the border
d. There's a jelly-fish at the surface of the water
e. Everyone was seated at the dinner table
f. Several men were standing at the bar

in these same sentences, the locative relation so specified would be less precise in exactly this way. Returning now to sentences 25. to 30., we see that we were misrepresenting ourselves somewhat; it is the marked interpretation of 'at' which is involved here as well and which was only partially captured by the use of the expressions 'right by'/ 'right adjacent to'.

We must now consider the following sentences and the co-occurrence restrictions which they illustrate. The point at issue is the

38. a. The company’s headquarters are
\[
\begin{align*}
\text{at/in Canada} \\
\text{at/in Alberta} \\
\text{at/in Calgary}
\end{align*}
\]

b. The trawler is adrift
\[
\begin{align*}
\text{at/in the Atlantic} \\
\text{at/on the high seas} \\
\text{at/in the Channel} \\
\text{at/in the mouth of the St. Lawrence}
\end{align*}
\]

c. The settlers homesteaded
\[
\begin{align*}
\text{at/on the prairies} \\
\text{at/on the coastal plain}
\end{align*}
\]
non-applicability of 'at' as superordinate to 'on' or 'in', indicating that there are restrictions on the relation of hyponymy holding between these expressions. What appears to be involved is some notion of 'point apprehensibility' of the location object.

Lindqvist (1950: 133) has informally characterized this feature quite accurately: "At is used with complements denoting areas, surfaces and spaces to represent them as points and indicate that something is located within an area or space or on a surface, but only with a view to localization, not to stressing their character as enclosing spaces or supporting-surfaces, etc. Thus the area, surface or space is not thought of in its material capacity as area, surface or space but as serving only as a general indication of locality, the mind apprehending the complement only as an ideal category at which thought has made a halt in its flight. Apparently, geographical areas such as countries, provinces, oceans, seas, etc., are not, generally speaking, apprehensible as points by the native speaker; and it is interesting to speculate as to what the reasons for this may be.

1 In the case of a city or town, point-apprehensibility is much more likely if the city or town is being viewed in a dynamic context, more particularly, as part of the itinerary of a journey of some sort. Thus, although some speakers may not accept the unstarred sentence with 'at' in 38.a. above, those below are less controversial (cf. also sentence 41.).

1. Mary had to change trains at Paris
2. The plane had to make an emergency landing at Chicago
3. The bus stops at Newcastle on its way to London

Furthermore, in such contexts, islands (if they are relatively small) are also point-apprehensible:

4. The ferry stops at North Uist on its way back from Harris
5. The cruise began at Gibralter and ended at Malta
First, as Lindkvist has noted, earlier stages of the language—particularly during the Age of Discovery—reveal the use of 'at' with countries and, as might be expected, distinctively with countries of the New World. Lindkvist cites several examples, including those below, and observes (1950: 135):

39. 1748: ... I assured him of his mistake, both in regard of Narcissa, and my staying at Paraguay... Smollett, Roderick II 288.

40. 1596: ...he hath an argosy bound to Tripolis, another to the Indies: I understand, moreover, upon the Rialto, he hath a third at Mexico; a fourth for England, and other ventures he hath, squandered abroad. Shak., Macb. I 321.

"This was especially the case with far-off countries, which, at a time when geographical knowledge was slight, were apprehended but vaguely by the minds of most people and were therefore easily thought of as points."

Secondly, we may note that point-apprehensibility has nothing directly to do with physical, objective size, for much larger objects—such as stars and planets—can, given (for the moment) a science fiction backdrop, be treated as points—cf. 41. What may be criterial is our conception of the world or globe as being

41. The spaceship will refuel at Uranus partitioned into land masses and water masses, the land masses being further partitioned into continents, the continents into countries, and the countries into states/provinces/counties, etc. The water masses are similarly, though less rigorously, partitioned into oceans and seas. That is, the conception of a mosaic or patchwork
is primary. This partitioning breaks down between the levels of counties and towns, cities, etc. (although it is resumed in towns large enough to have subdivisions into districts) since a county can not be cut up into city-size chunks which together comprise the whole in the same way as a country can be cut up into county-size chunks. Thus, it is not surprising that cities and towns are point-apprehensible, that they can be conceptualized and represented as points or dots on a map.

However, these more speculative remarks to the side, it must be noted that the use of 'at' with names of towns, cities, etc. is not entirely unconstrained. It would appear that certain contexts are more natural with such a combination than others, but it is not at all clear how one is to explicitly characterize this set of contexts. Our remarks must therefore be of a rather informal nature (cf. Lindqvist (1950) for a more detailed discussion). The most well-defined context is one which is implicitly dynamic or directional, where the town or city is a beginning, stopping or ending point on the 'path' of a journey (broadly conceived), as in 41. above (cf. also fn. 1, p. 59). Secondly, 'at' often occurs when a situation of relatively short duration and, usually, of relatively great importance is being described, such as the signing of treaties, the founding of institutions, the holding of meetings and exhibitions, births, deaths, etc. Some examples are given in 42. Thirdly, there are the rather

42. a. At Philadelphia the famous Declaration of Independence was signed in 1776

b. The 1976 summer Olympics will be held at Montreal
representative of an institution of some kind is being referred to: 'the University of California at Los Angeles', 'the British School at Rome', 'our Cultural Attache at Madrid'. It may be possible to subsume such contexts under those where the prepositional phrase is functioning as a prepositional attribute to noun phrases denoting important streets, squares, buildings, shops, schools, factories, etc. within the city or town. The following examples are taken from Lindkvist (1950: 384). Finally, in contexts other than the

43. a. In general appearance St. Paul's bears a marked resemblance to St. Peter's at Rome, but is, of course, much smaller.

b. He was over forty when he entered that oddest portal, the Victoria Terminus at Bombay

implicitly dynamic or directional one, the perceived or known size of the city or town affects its point-apprehensibility. Lindkvist remarks (1950: 366-7) that "very large towns often cannot be apprehended by the speaker or writer as points of space: he knows that they form large expanses, often little smaller than counties or provinces, and the area-conception therefore comes natural to him so that it predominates in almost all cases, causing him to use in."

Thus, Lindkvist notes that 'London' is rarely used nowadays with 'at' although such usage was not uncommon in past centuries when London was not so large.

Two further observations can be made. First, when the location object is inherently a point, none of 'on', 'in' or 'at' (marked) may substitute for 'at' (superordinate) without a change in meaning or making the sentence deviant. The interpretation is one of
"coincidence", as in 43. Secondly, the marked interpretation of

43. a. Line AB intersects line CD at point E
   
   b. The intersection of line AB and line CD coincides with
      point E
   
   'at' is possible with non-point-apprehensible location objects but
   only, it would seem, in contexts where the object is somehow con-
   ceived as a barrier to the line of travel; and this fits in well with
   what we have said about the confrontation element of this interpreta-
   tion. Examples are given in 44.

44. a. At the Channel we boarded the Hovercraft.
   
   b. They added two more engines to the train at the Rockies.
      in order to climb Rogers Pass
   
   c. At the Great Lakes we were transferred to a smaller ship
   
   Thus, to summarize, we have two interpretations of 'at', one
   ("at_1") which is localization or coincidence of the object to be
   located with a point, inherent or apprehended, and one ("at_2") which
   is in contrast with that of 'in' and 'on' and which involves confront-
   ation or immediate juxtaposition with the location object, this
   object pragmatically representing a barrier or obstacle with respect
   to the object being located. The object being located is, so to
   speak, one step away from being coincident with the location object.
   Furthermore, the use of 'at_1' implies the applicability of one of
   'at_2', 'on' or 'in', which one being, in general, pragmatically
   selected. We may represent this hyponymic relation as in 45., where

45. 

\[ \text{'at}_1' \rightarrow \text{'at}_2', \text{'on'}, \text{'in'} \]
'at₁', the unmarked term, is superordinate to its marked counterpart 'at₂' as well as to 'on' and 'in'. The relationship is not truly hyponymic, however, in that there is an element of the meaning of 'at₁' (the point apprehensibility of the location object) which is not a part of its hyponyms. This situation could be compared to that of the hyponymic relationship between 'man' (unmarked for a sex distinction) as superordinate and 'man' (marked for male sex) and 'woman' as its hyponyms. As Lyons (forthcoming: §8.4.) has pointed out, the unmarked, superordinate use of 'man' appears to be restricted to generic or generic-like contexts.

However, we have still not accounted for the oddity of 20. and 23.a., repeated below, but we have suggested that what is at work here

20. "The house is at John

23. a. "John's letter is at the cigar box"

is some further restriction on the location object other than its being CONC. One might suspect that 20. is odd because of a location object which is human. Indeed, this has something to do with the ill-formedness of 20.; for, in general, animate (or, at least, animal) subjects tend to be preferred. That is, subjectivization would normally take place in a sentence like 20. to give 20'.

(cf. Lyons, 1968: §8.4; Anderson, 1971b: §7.34). However, this

20'. John has the house

does not solve our problem entirely, for 20'. favours an abstract (possessive) interpretation and is again somewhat odd under a concrete reading.

Another way to approach the problem is to imagine complex situations to some aspect of which 20. or 23.a. could feasibly be
used to refer. We can then determine if there is a natural characterization of the special requirements we have placed on the location object in such situations which are normally not satisfied by objects such as human beings and cigar boxes.

Suppose, for example, that the letter described in 23.a. is being transported about by an army of ants on a desk on which there is a cigar box. If they stop for a rest right next to or are passing directly in front of the cigar box, then 23.a. would be appropriate as a description of the letter's location at that moment. Or, consider a group of children playing a game of catch with a small toy house; again, 20—or preferably 20'—becomes acceptable with a concrete interpretation. What is characteristic of the requirements on these situations is that the location objects—the cigar box and John—are 'fixed' or 'grounded' in some sense, at least relative to the objects being located; and, in general, human and loose objects do not have this property of permanence while cities, buildings, trees, rivers, etc. do.¹

¹ Cf. Strawson, 1959: 54: "Material bodies, in a broad sense of the word, secure to us one single common and continuously extendable framework of reference, any constituent of which can be identifyingly referred to without reference to any particular of any other type... Of course not all material bodies, or things which have them, are regarded as even transient parts of such a framework: many bodies are too much in movement, or too ephemeral, or both. One would not, so to speak, use them in giving spatial directions unless they were then and there observable."

We may consider in this context the sentence below:

1. I'll meet you back at the car

Although cars are in motion much of the time, this sentence is perfectly acceptable since, when appropriately employed, both speaker and addressee know where the car will be when each is about to return. In the most normal situation, it will be where they left it. For the purposes of establishing the rendez-vous, the car is grounded.
We can state then, as a general restriction on direct locative relations \((X \text{ loc } Y)\), that the object functioning as the location of the other cannot itself have a variable location in the situation referred to. We will leave this condition of 'groundedness' in the informal format as just stated. Nothing would be gained by incorporating it, for example, as a required feature \((\text{GROUNDED})\) of \(Y\) since it is not obvious that it would have any other systemic use.

Now, there is a special class of objects for which this condition of groundedness is always met, namely parts of objects. Although the location of a box may vary with time, the location of its sides, top, bottom, edges, and corners are grounded with respect to the whole of the box. Similarly with John's feet—cf. 46. Such an observation,

46. a. The letter is at the side of the cigar box
b. The toy house is at John's feet.

in conjunction with purely semantic considerations, would suggest that the greater naturalness of 23.b. and 23.c. compared with 23.a. (i.e. the non-necessity of creating or imagining somewhat unnatural reference situations) could be accounted for if 'on' and 'in' involved an aspect or part of the reference object in their semantic representations, i.e. if the location object in 23.b. is the surface of the cigar box and in 23.c. the interior. Similarly, 'at' would involve reference to the edge or boundary of an object. If such is the case, then whereas 'at' expresses immediate juxtaposition with the boundary of the reference object, 'on' expresses contiguity with
the surface of it,\textsuperscript{8} and 'in' intersection or inclusion\textsuperscript{9} with respect to its interior. Thus, 'at', 'on' and 'in' incorporate in their definitions both a particular spatial relation plus a reference to a part of the reference object, this part functioning as the location object in the locational relation. Hence, strictly speaking, these prepositions no longer conform to the criterion for direct locative expressions since the location and reference objects are not identical. However, the relationship between the two—that of a part to a whole—is much more intimate than in the case of

\begin{itemize}
  
  \item[1.] The stamps are already on the parcel
  \item[2.] Your pen is on the parcel
\end{itemize}

allows natural interpretations whereby the stamps could be on the sides or on the bottom of the package as well as on the top, sentence 2. is normally interpreted as meaning "on the top of the parcel".

\textsuperscript{8} Besides expressing contiguity, 'on' requires that the surface of the object in some manner support the object to be located; or, put the other way, that the object to be located adheres to the location object. In the case of two free objects, the most natural means of support or adhesion is that resulting from the pull of gravity when one object is above the other and the surface of the latter is horizontal—i.e., when one object is on top of the other. In the case of non-horizontal surfaces, 'on' can only be used if there is some adhesive connection (paste, nails, friction, stitches, magnetic/electrical attraction, suction, etc.) between the two objects (cf. the wallpaper on the ceiling, the picture on the wall, the metal filings on the bottom of the magnet, the rubber arrow on the window, pockets on a jacket). Thus, whereas sentence 1. below

\begin{itemize}
  
  \item[1.] The stamps are already on the parcel
  \item[2.] Your pen is on the parcel
\end{itemize}

allows natural interpretations whereby the stamps could be on the sides or on the bottom of the package as well as on the top, sentence 2. is normally interpreted as meaning "on the top of the parcel".

\textsuperscript{9} Cf. Goodman (1966) for an exposition of a calculus of individuals (rather than of classes), in which the symmetrical, reflexive two-place predicate "overlaps" is taken as the sole primitive. The semantic formula \(x \text{ overlaps } y\) (or \(x \circ y\)) is interpreted as \(x\) has some part in common with \(y\) and \(x\) is part of \(y\) (or \(x \subset y\)) is, by definition, "everything which overlaps \(x\), overlaps \(y\)." Whereas 'in' seems to require only "overlapping" in its semantic representation, 'inside' entails the stronger "is a part of". We have used the corresponding set-theoretic terms rather than overlaps and 'is a part of' since they are more familiar and easier to manipulate.
semi-direct locative expressions, and so we will continue to classify them as direct locative expressions. The unmarked use of 'at' is so because it makes no reference to a part of the reference object. However, this latter must, in lieu, meet the general condition of groundedness. Furthermore, it must be inherently a point or apprehensible as such. Thus, looking at the matter from a somewhat different point of view, the superordinate use of 'at' is unmarked for dimensionality in the sense that, since it requires its reference object to be a point, its location object cannot be a part of the reference object but only the reference object itself, for points have no parts. We can summarize these conclusions in the following tentative definitions:

47. a. 'X at Y': X coin Y Condition: Y is grounded with respect to X & Y is point-apprehensible

b. 'X at Y': X juxt PER(Y) Condition: Y is a barrier/obstacle with respect to X

c. 'X on Y': X cont SUR(Y) Condition: Y supports X

d. 'X in Y': X ints INT(Y)

where coin stands for "coincides with", juxt for "is immediately juxtaposed with", cont for "is contiguous with", ints for "intersects/overlaps with", PER( ) for "the periphery of", SUR( ) for "the surface of", and INT( ) for "the interior of".

We may look upon the unmarked use of 'at' as expressing the most intimate type of localization—pure coincidence with a point, whether real or idealized. The three hyponyms continue to express the closest possible locational relation between two objects but this time within the constraints imposed by the nature of the objects. That is, they express the 'next best' and 'real life' alternatives
to ideal coincidence. In this respect, the analysis presented above has features reminiscent of Hjelmslev's (1935: 127-8) discussion of the opposition 'cohérence' - 'incohérence', one of the three dimensions casuelles underlying the 'système sublogique' of the cases (and prepositions). This dimension he defines roughly as "le degré d'intimité avec lequel les deux objets sont ensemble". The positive term of the opposition was labelled 'cohérence', the negative 'incohérence'. This opposition is first envisaged as "celle entre une relation spatiale bu l'un des objets envisagés est contenu dans l'intérieur de l'autre, et une relation spatiale bu l'un des objets envisagés est extérieur à l'autre". However, Hjelmslev recognizes a second manifestation of this opposition in which the distinction is one of a relation of contact versus one without contact. Thus, he concludes that "ces deux formes particulières de la deuxième dimension ne sont pas essentiellement différentes... Par cohérence nous comprenons le fait général d'être lié par une connexion relativement intime à un autre objet.... Les deux formes particulières prise par l'idée générale de cohérence peuvent, s'il y a lieu, recevoir les noms d'inhérence et d'adhérence; il y a inhérence quand la distinction est celle entre l'intériorité et l'extériorité; il y a adhérence quand la distinction est celle entre contact et non-contact."

If we now let loc stand for the closest possible spatial relation between an object and a location object, then its further specification as coin, juxt, cont, or into will, in the majority of cases, be predictable (and hence redundant) from the nature of the location object—whether it is (a point apprehension of) the reference object or its periphery, surface or interior, respectively. Thus we
have the following simplified semantic representations for the set of expressions in 48. (the conditions on each remaining the same).

49 a. 'X at Y': X loc \( Y_{lib} \)
b. 'X at Y': X loc \( \text{PER}(Y_{r}) \)
c. 'X on Y': X loc \( \text{SUR}(Y_{r}) \)
d. 'X in Y': X loc \( \text{INT}(Y_{r}) \)

Before leaving the discussion of direct locative expressions, we must look at the three expressions 'away from', 'off (of)' and 'out of', these having been analyzed as the negative counterparts of 'at', 'on' and 'in', respectively, by both Leech (1970) and Gruber (1965). But the exact nature of the semantic relation between each positive/negative pair is not portrayed as the same in the two analyses. For Leech, the pairs of sentences below are taken to be equivalent; and accordingly, he suggests (1970: 163) that "to define these

50. a. He is not at the match
   b. He is away from the match

51. a. He is not on the lawn
   b. He is off the lawn

52. a. She is not in the kitchen
   b. She is out of the kitchen

prepositions one simply adds the negative formator to the previous definitions:

- **away from**: \( \sim \rightarrow \text{FLA} [\ 1 \ \text{DIME}]\) 'not at'
- **off**: \( \sim \rightarrow \text{FLA} [\ 2 \ \text{DIME}]\) 'not on'
- **out of**: \( \sim \rightarrow \text{FLA} [\ 3 \ \text{DIME}]\) 'not in'

We are concerned here with propositional negation of the kind which
Lyons (forthcoming: §13.3) calls 'nexus negation', i.e. the non-negated proposition and negated proposition are contradictories. As we will be interpreting such negation as a higher predicate (cf. §7.3.3), we can translate the above definitions into the present framework as in 53.

53. a. 'A away from B': \( \sim (A \text{ loc } B) \) or \( \sim (A \text{ loc } \text{PER}(B)) \)

b. 'A off (of) B': \( \sim (A \text{ loc } \text{SUR}(B)) \)

c. 'A out of B': \( \sim (A \text{ loc } \text{INT}(B)) \)

Gruber, on the other hand, interprets the negativity of 'away from', 'off (of)' and 'out of' somewhat differently: "We would therefore say that from is also a negative of at, and similarly for in and on we have negatives out of and off of. Thus away from means approximately 'at a place in the complement of'" (1965: 40). Later on, with respect to 'away', he proposes that 'in the prelexical structure we have what amounts to 'at a place', which when in conjunction with a from-phrase means away from, for example, 'at a place not at the door' is 'away from the door'. Just like other, else, different, etc., away may appear without the from-phrase present, although it is always implied" (1965: 72). Gruber also takes such pairs of sentences as 50. to 52. as equivalent. He does not formalize his definitions of 'away from', 'off of' and 'out of', but within the present framework they would take the form of 54. Formula 54.c., for example, can be read as "A's location is some place, x, such that it is not the case that x is the interior of B".

54. a. \( A \text{ loc } (\exists x)(\sim (x=B)) \) \( \equiv \)

\( (\exists x)((A \text{ loc } x) \& (\sim (x=B))) \)

b. \( A \text{ loc } (\exists x)(\sim (x=\text{SUR}(B))) \) \( \equiv \)

\( (\exists x)((A \text{ loc } x) \& (\sim (x=\text{SUR}(B)))) \)
However, there are reasons for supposing that neither of these relatively simple analyses is appropriate for this set of expressions. Looking first at the more straightforward cases of 'off (of)' and 'out of', it is simply not true that pairs of sentences of the type exemplified in 51. and 52. are equivalent. Generally speaking, although a sentence involving a locative expression with 'off' implies the propositional negation of the corresponding sentence with 'on', and similarly with 'out of' and 'in', the converse does not hold. Whereas the a. sentences in 55. to 58. below each imply the corresponding b. sentence, the reverse is not true. The entailment which is lacking in the case of the b. sentences is that, at an earlier time, the proposition expressed by non-negated sentence was true.  

1 If it is the case that 1. below is acceptable in a context in which it is given or inferable that the door has never been on its hinges (e.g. in the context of a house under construction) then we shall have to allow not only for what was previously the case but also for what ought to be or is naturally the case. However, judgements concerning the acceptability of 1. in such a context are not at all clear cut and sentences 2. or 3. are preferred alternatives.

1. The door is still off its hinges
2. The door is still not on its hinges
3. The door is still not on its hinges yet
That is, 55.a., 56.a., 57.a. and 58.a. would be deviant if it were not previously the case, respectively, that the books were on the shelves, the dishes on the table, the child in his playpen and the car in the garage. Thus, rather than being equivalent to the b. sentences, the a. sentences are more adequately paraphrased, respectively, by 55.c. to 58.c. We will be investigating the semantics of the expression

55. c. The books are not on the shelves anymore/any longer
56. c. The dishes are not on the table anymore/any longer
57. c. The child is not in his playpen anymore/any longer
58. c. The car is not in the garage anymore/any longer

'not...anymore' in Chapter 9. However, we may note at this point that its central component of meaning is "cease to be" or "come to be not"; and sentences 55.a. to 58.a. seem to be accurately paraphrased by (i.e. logically equivalent to) sentences 55.d. to 58.d., respectively. The definitions given by Leech and Gruber would correspond

55. d. The books have come to be not on the shelves
56. d. The dishes have come to be not on the table
57. d. The child has come to be not in his playpen
58. d. The car has come to be not in the garage

only to the embedded clause in each of 55.d. to 58.d.¹ We will not

¹ Leech does in fact recognize the possibility—or even probability—of a 'resultative position' interpretation of these expressions. However, his analysis of resultative position is such that the static formula is basic and is implied by the resultative one, since both the static and the resultative formulae would have, in these instances, the same realization, we would have the unfortunate consequence that 1., for example, non-trivially implies 2.

1. The picture is off the wall
2. The picture is off the wall

What we have, in the case of 'off of' and 'out of', is rather a situation comparable to the lexeme 'dead'. This lexeme does not realize "not alive", but rather "having come to be not alive", since what has never been alive cannot be described as being dead, but only as not alive (=inanimate).
To establish the logical equivalence of the formulae in 53. and 54. we must invoke two basic axioms. Looking first at the implication from 54.a. to 53.a., the axiom required is, informally, that a given object has only one location (at a given moment), or more colloquially, that you can't be in two places at the same time. We can formalize this (omitting the temporal specification) as in 1. below.

1. 'A loc B ⊃ (∀x)(x≠B ⊃ ¬(A loc x))

Now, if we let w be a constant which makes 54.a. true, then we have, by existential instantiation (Wall, 1972: 68), the formula 54.a.'.

54. a.1. 'A loc w (w=B)

This, in conjunction with the uniqueness axiom in 1., allows us to deduce 53.a.

Working in the other direction, from 53.a. to 54.a., we require the additional axiom that everything (which exists) is located somewhere; or, as Kahn (cited by Lyons, 1968: 499) concludes from an analysis of Greek, that "whatever is, is somewhere; whatever is nowhere, is nothing". More colloquially, again, the same axiom is expressed by such sentences as It's got to be somewhere. We can combine this axiom with the uniqueness axiom to give 2. We can read

2. (∀x)(∃y)(x loc y & (∀z)(z≠y ⊃ ¬(x loc z)))

2. as "for all objects, x, existing in the universe of discourse, there is a place, y, such that y is x's location and for all other places, z, it is not the case that z is x's location". From 2., 53.a., and the assumption that the entities being talked about exist (cf. the presupposition of existence for the referent of a definite description—Strawson, 1952: 175), we can, by means of universal instantiation (Wall, 1972: 65) for both x and z, deduce 54.a. When the existence of the entities being talked about cannot be assumed, then the implication in this direction fails. This is the case with locative sentences involving indefinite noun phrases and with temporal locatives as adjuncts to full sentences or as complements to nominalized sentences or second-order nominals. Thus, 3.a. below does not imply 3.b., nor does 4.a. imply 4.b., nor 5.a. 5.b.

3. a. There isn't a telephone box at the corner
b. There is a telephone box at a place which is not the corner

4. a. John didn't telephone me at 6:00
b. John telephoned me at some time other than 6:00

5. a. The assassination of the president didn't take place at 6:00
b. The assassination of the president took place at some time other than 6:00
This perfected ingressive factor in the interpretation of 'off (of)' and 'out of' in locative sentences is confirmed by the oddity of such sentences when the object being located is not capable of movement, i.e. of changing its location. This is the case in sentences 59.b. and 60.b. Sentence 61., an apparent counterexample,

59. a. Vancouver is not on the prairies
   b. ?Vancouver is off the prairies

60. a. The Rockies are not in Saskatchewan
   b. ?The Rockies are out of Saskatchewan

61. John's office is (just) off Mayfield Road

actually provides further support for the ingressive interpretation of 'off (of)', for its interpretation requires reference to the path one must take to reach John's office—i.e., one must turn off (= come to be not on) Mayfield Road. (However, an alternative analysis can be given—see below.)

The resultative interpretation of these expressions in locative contexts (i.e. after the verb 'to be') suggests that they are primarily directional or destinational in meaning and that their more natural use is in dynamic contexts (i.e. with motional verbs). And it would appear (cf. Bennett, 1972a) that, to native speakers of English, the sentences in 55.e. to 58.e. represent the unmarked or basic use of 'off (of)' and 'out of' rather than sentences 55.a. to 58.a. (cf. also Bennett, 1972, for the use of this criterion in establishing the basically directional nature of such expressions as 'across', 'past', 'through').

55. e. The books fell off (of) the shelves

56. e. The dishes slid off the table
57. e. The child crawled out of his playpen.

58. e. John backed the car out of the garage.

Similar observations hold, in general, for 'away from' although we must consider its application as a counterpart of both the unmarked and marked interpretations of 'at'. In this light, 62.a. (unmarked) and 63.a. (marked) are again more appropriately paraphrased by 62.c., d. and 63.c., d., respectively, than by 62.b. and 63.b. And, because of the implausibility of cities moving, 64.b. is deviant.

62. a. John is away from the post office
   b. John is not at the post office
   c. John is not at the post office any longer
   d. John has come to be not at the post office

63. a. The chairs are away from the table
   b. The chairs are not at the table
   c. The chairs are not at the table any longer
   d. The chairs have come to be not at the table

64. a. Nanaimo is not at the tip of Vancouver Island
   b. Nanaimo is away from the tip of Vancouver Island

However, there are complications with 'away from', in that it is frequently employed to express vectorial location. That is, it expresses direct location at the end point of a particular extent or distance whose beginning point (marked by 'from') is the reference object in the locative expression. Hence, 64.b. becomes more acceptable once a measure phrase is inserted, as in 64.b'. Similarly,

64. b' Nanaimo is a hundred miles away from the tip of Vancouver Island

62.a. and 63.a. can have a natural non-resultative interpretation:
62. a. John is a few blocks away from the post office

63. a. The chairs are a few feet away from the table

This use of 'away from' should not be all that surprising, for we could reasonably expect there to be some such semantic congruency in the expression of initial and (non-specific) final locations of a journey (i.e. 'away from' in its resultative application—'from' marking the initial location, the 'origin' of movement) and that of beginning and (non-specific) end points of an extent or distance ('away from' in its vectorial locative application—'from' marking the beginning point, the 'origin' of the vector). We can not pursue this congruency, nor the explicit definitions of 'away from', 'off of' and 'out of', any further at this point as it requires a more detailed discussion of what a journey and a path are, and this will not be dealt with until later. However, we may note that 'off (of)' and 'out of' may also have vectorial locative uses, 'of' functioning in the same capacity as 'from'—cf. 65. to 68. Sentence 67. suggests the nature

65. The swing is two feet off (of) the ground

66. The flagpole protrudes three feet out of the wall

67. John's farm is a few miles off the A9

68. John lives five miles out of the city

of the alternative analysis for sentence 61.

Finally, we may observe that there is an alternative expression which can take the place of 'away from' in the context of marked 'at', namely 'back from'. This further supports the inclusion of some element of confrontation in the definition of 'at_2':

69. a. Mary stood at the window and waved

b. Mary was standing (well/a few feet) back from the window so as not to be seen
78. a. The dog was asleep at the fire
   b. The arm chair sat well back from the fire

3.3 Semi-direct location

3.3.1 Preliminary remarks

The interdependencies between the meanings of such locative expressions as 'over'/under', 'in front of'/in back of' (≈ 'behind'), 'on the left of'/on the right of', such directional expressions as 'up(wards)'/down(wards)', 'forwards'/backwards', 'sideways'/to the left'/to the right', and such part- or extremity-identifying expressions as 'top'/bottom', 'front'/back', 'left/right)side' have been remarked upon or incorporated into particular analyses by several linguists (cf. Collinson, 1937; Cooper, 1968; Lyons, 1968a: § 7.4; Teller, 1969; Leech, 1969: § 8.2; Anderson, 1971b: § 4.21; Wierzbicka, 1973; H. Clark, 1973). Furthermore, it has been well-established that all three sets of expressions, as well as the set of dimensional adjectives including 'tall'/short', 'high'/low', 'long'/short', 'wide'/narrow' (cf. Bierwisch, 1967; Teller, 1969), participate in structuring a three-dimensional semantic field or space which is highly congruent with the three-dimensional orientational framework.

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1 There is one important class of exceptions to the resultative interpretation of 'away from', 'off (of)' and 'out of'. When these are embedded under such continuative verbs as 'keep', 'stay', 'remain', there is no implication that the object concerned was previously at, on or in the reference object:

1. John kept away from the ridge
2. The children remained off the lawn
3. The airplanes stayed out of the danger zone

Furthermore it is not entirely clear that these should instead be accounted for in terms of the vectorial locative application of the expressions.
of our physical-perceptual space. Both these spaces involve three mutually perpendicular axes: a vertical axis and two horizontal axes. Of further importance in this particular semantic domain is the role of what H. Clark (1973) refers to as 'canonical position', i.e. the situation obtaining when the inherent vertical axis of an intrinsically oriented object (cf. below) coincides with the geological vertical axis defined with respect to gravity. For example, the canonical position for human beings is an upright, standing posture. Related to this, is the role of 'canonical encounter' (or, in Lyons' (forthcoming: § 8.3) terminology, 'confrontation'), i.e. the tendency for two people, when interacting (e.g. speaking) to face each other a short distance apart. Precisely how these two factors are involved in the definitions of the above expressions will be made clearer in the following discussion.

The semantic interrelationships or interdependencies between these three sets of expressions—locational, directional, extremity—identifying—may be analyzed in different ways according to which of the corresponding types of semantic relations is taken as more primitive. That is, the meaning of the locative expression 'over', for example, may be analyzed in terms of a more primitive directional relation, such as is denoted by 'upwards' (cf. Collinson, 1937; Leech, 1969), so that 'A is over B' is given the semantic interpretation "A's location is a place upwards from B"; or it may be analyzed in terms of a more primitive extremity-of-an-object relation, such as is denoted by 'top' (cf. Cooper, 1968; Teller, 1969), so that 'A is over B' is interpreted as "A is in the space contiguous with the top of B". On the other hand, the extremity relation denoted by 'top' could instead be treated as dependent upon a locative relation, that denoted by 'over'
(cf. Wierzbicka, 1973), so that "A is the top of B" means "A is the part of B over every other part of B", or upon a directional relation, such that the same sentence is analyzed as "A is the upward extremity of B" (cf. Leech, 1969). Similarly, though not in any of the above-mentioned studies, the directional expressions could be defined in terms of locative or extremity relations. In this case, "A is upwards from B" could be either "A is towards a place over B" or "A is away from the top of B". However, all these definitions have required one of three basic or skeletal relations—"have as a location", "be an extremity of", and "be towards/away from"—according to whether it is a locational, extremity-identifying, or directional expression respectively.

That such a choice in the set of basic elements should be possible follows from the fact that the three sets of expressions all relate to the same three-dimensional space, and their ultimately circular interdefinability is in accordance with a view of the semantic structure of a language as a system (of systems) where "tout se tient". Although from a strictly formal point of view which set of relations is chosen as basic may, therefore, appear to be arbitrary or, at least, only constrained by possibly economy, symmetry of pattern or some other such evaluation metric (cf. the reasons given by Wierzbicka (1973) for her choice of primitives), there may be morphological evidence to suggest that, for the semantic analysis of particular expressions, at least, one or other of the sets of relations are linguistically prior. In English, and other languages, many locative and directional expressions are morphologically complex ones, built up (diachronically and/or synchronically) from a simple locative (e.g. 'at', 'on', 'in') plus a noun denoting a part or extremity of an object (e.g. 'front', 'top',
...side', 'head')--as in 'in front of', 'on top of', 'beside', 'ahead' (cf. Lyons, 1968: 7.4.6). However, the reverse situation may also hold--cf. Latin 'supra' 'summus', 'infra' 'infimum', etc.

However, beyond such morphological evidence, it is difficult to find arguments in support of one set of basic relations rather than another; and the choice has been more or less arbitrary. Leech (1969), for example begins with three mutually perpendicular dimensions or axes, leaving as intuitive how the polarization or direction is determined or induced on each axis. Such polarized axes are most naturally interpreted as vectors or directional relations, but Leech does not treat the directional expressions themselves except for 'toward', whose major role in this series is obscured by its definition being unnecessarily restricted to the primary horizontal axis (cf. Leech, 1969: 187). However, from the directed axes, Leech proceeds to definitions of the locative expressions and the expressions of parts and extremities. Teller (1969) takes a similar starting point (originating with Bierwisch's (1967) work on dimensional adjectives) but sees only the extremity or part expressions as defined directly in terms of the three axes. He then suggests that the locative expressions be defined in terms of the extremity relations, this being explicitly carried out by Cooper (1968). Wierzbicka (1973), on the other hand, begins with only three primitives "to become", "to be a part of" and "world", from which (after deriving the ordering relation "closer to") she builds up the locative relations such as 'under', and then the part relations, such as 'top', 'bottom'.

We can approach the problem from a somewhat different angle by trying to explicitly correlate semantic elements with perceptual or physical ones, i.e. by getting out of language itself (cf. H. Clark,
First of all, independent of the properties of the human body, our world presents us with an absolute plane of reference—the (perceptually) flat surface of the earth, the ground. It also provides an absolute axis perpendicular to this plane—referred to as the vertical axis—and determined, primarily, by our experience with the force of gravity (the line of free fall) but also with respect to such other physical phenomena as the growth of plants and the relatively fixed position of sun, stars, and moon with respect to the ground.

Secondly, the human body is asymmetrical in two dimensions—the top-bottom dimension and the front-back dimension. These asymmetries are structurally inherent ones, corresponding to the fact that the head and feet are physically and functionally distinct and diametrically opposed parts of the body, as are the chest (or face) and the back (spinal region), and all four are in a fixed relationship of connection one to the other or to other parts of the body. Furthermore, the concentration of the perceptual apparatus in the head and, more specifically, in the face, makes the top and front of the body functionally dominant when compared to the bottom and the back. Thus, there is a natural polarization of the body (cf. that of a bar magnet) whereby the top and front can be said to be 'positive' with respect to the 'negative' bottom and back, respectively. We therefore have two additional axes of orientation—an intrinsic vertical axis passing through the top and bottom of the human body and an intrinsic, primary horizontal axis passing through the front and back. And these two axes are polarized or directed by extrapolation from the intrinsic polarization of the body parts defining them—cf. Figure I. Finally,
Figure I

(a) intrinsic vertical axis
(b) intrinsic, primary horizontal axis

an intrinsic but unpolarized secondary horizontal axis, perpendicular to the front-back axis, corresponds to the left-right symmetry of the body: the left side of the body is the mirror image of the right. This symmetry is manifested by the existence and the placement of two eyes, two ears, two nostrils, two arms, two legs, etc.

When this intrinsic, anthropocentric three-dimensional orientational system is imposed and superimposed upon the absolute one, it is normally done in such a manner as to (1) optimize the body's perceptual field, (2) minimize, within the constraint of allowing the hands to be free to manipulate objects, the effort needed to balance oneself, and (3) conform to the requirements for self-locomotion. Regarding the first factor, since most objects to be perceived are affixed to and rise from the ground, the optimal perceptual field is obtained when the front-back axis (i.e. eyes-back of the head) is parallel to the ground, i.e. perpendicular to absolute (gravitational) vertical. That is, there is little point in normally orienting the face towards the sky or towards the ground. As to the second factor, humans have evolved an upright, bipedal stance—i.e., feet on the ground and the top-bottom axis coincident with gravitational vertical. This normal position and posture in which humans operate in the physical world is what H. Clark
has felicitously termed 'canonical position'. When a body is in canonical position, its intrinsic vertical axis coincides with the gravitational vertical (hence the use of the term 'vertical' for both axes and the potential ambiguity of such expressions as 'above' and 'below' when the two vertical axes are not coincident—cf. § 3.4.2), the plane defined by the intrinsic horizontal axes is parallel with the ground, and the 'negative' extremities along the intrinsic vertical axis (i.e., the feet) are on the ground. Thus, the two intrinsic horizontal axes add structure to the undifferentiated absolute horizontal plane, and the intrinsic vertical axis adds a direction, or polarization, to the absolute vertical axis. Although the horizontal plane may be structured by natural phenomena of an absolute nature, such as geographical landmarks (e.g. mountain chains, coastlines, rivers and their direction of flow), the position of stars or constellations, the trajectory of the sun (both throughout the day and
throughout the year), migratory patterns, and magnetic attraction, such systems of horizontal orientation are not an invariant nor as universal as the natural phenomena determining gravitational vertical, nor as flexible as the intrinsic system of horizontal orientation.

It is not surprising that they do not find systematic linguistic reflexes in the core of all languages (cf. Lyons, 1968: §7.4.6; forthcoming: §8.3).

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1 This has evolved, in the civilized world, into the highly exact, standardized and absolute compass orientational system, comprising a north-south and an east-west axis (cf. Leech, 1969) and into the locational framework of cartography, whereby the earth is segmented into degrees of longitude (north-south axes) and latitude (east-west axes). An awareness of such axes and the existence of expressions denoting them does not depend, of course, upon the development of such a sophisticated framework, and in many languages more or less functionally equivalent ones have evolved, singly or together, from some of the other natural phenomena mentioned above. In Gilbertese, for example, the trajectory of the sun would appear to be salient: 'rake' may mean either "eastwards" or "motion upwards"; 'rio' may mean either "westwards" or "motion downwards" (cf. Cowell, 1951: 46). More interesting in the present context are the compass terms in Old Irish. The set of expressions 't-air', 't-iar', 'dese', and 'tuald' have both the interpretations "in front of", "behind", "right", and "left", respectively, and the interpretations "east", "west", "south", and "north", respectively. That is, the directional interpretations are assigned according to the relative positions of the body parts when one is facing the sunrise (cf. Thurneysen, 1946: 483; Hughes, 1970).

For a classic treatment of directional terminology where this is based on the 'absolute' location of certain predominant features in the physical environment of a geographically restricted community of speakers, see Boaz (1934). For example, he observes (p. 171) that "instead of the points of the compass they orient themselves according to the direction of the coastline and rivers. Down river and down along the coast (in the sense of northward or westward); up river and up the coast (in the sense of southward or eastward); inland, away from sea or river; and seaward, away from land are the principal directions which appear commonly in geographical terms". For an extensive bibliography on the orientational systems of various languages, see Conklin, 1972.
Returning now to the problem of the choice of primitives, we see that the directional expressions 'upwards'/'downwards' are definable without necessarily making reference to other locational or extremity relations--i.e., they can be defined simply with respect to gravitational vertical--and, likewise, the extremity expressions, for humans at least, have independent characterizations in terms of the asymmetries in the physical structure of the human body. These immediate considerations, as well as the morphological motivation mentioned earlier, suggest that for the analysis of some spatial expressions extremity relations can be taken as basic. However, this presupposes that such extremity relations--as "is the front of" can apply not only to human beings, but also to other intrinsically oriented bodies--and also to non-intrinsically oriented ones. For clearly, such locative expressions as 'in front of', 'on top of', 'beside' are not used solely in the expression of locative relations in which the reference object is human.

In the case of the vertical extremities (the top and bottom of an object), the situation is relatively straightforward, for extrinsic tops and bottoms can be defined, for any object, in terms of the independently characterizable direction of gravitational vertical. Now, some objects are asymmetrical along that dimension which, when the object is in its most usual or common position, is aligned with gravitational vertical. Such objects--bottles, brooms, candles, tables, etc.--can be described as having intrinsic tops and bottoms which can be at variance with their extrinsic, gravitational top and bottom. However, it must be stressed that intrinsic extremities exist only when the
object concerned consistently has a structural asymmetry, however slight, along the relevant dimension and a 'canonical position' (i.e. a particular end up, the other down) with respect to that dimension. Thus, a uniform pole has a top only when it is upright—i.e., it has only an extrinsic top—whereas a flag-pole has an intrinsic top, as well as an extrinsic one, since one of its ends is structurally differentiated from the other, minimally by whatever means are used to secure a flag to it and, in its normal position, that end is furthest from the ground. In principle then, we suggest that all intrinsic extremities of objects have independent characterizations. Furthermore, as gravitational vertical is unique and invariable, extrinsic tops and bottoms defined with respect to it are, in a given situation, unique and invariable, regardless of the observer, as are intrinsic tops and bottoms.

This latter property of constancy does not obtain when we consider the application of 'front' and 'back' (and 'left' and 'right') to

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1 We will stretch the interpretation of 'structural asymmetry' somewhat to allow for anything which naturally or conventionally distinguishes one pole from another. For example a difference in colour or simply the label 'top', both of which are not structural properties in the strict sense of the word, would serve the purpose of differentiating the top of a box from the bottom.
non-intrinsic objects. However, let us consider this problem along with that of the assignment of 'front' and 'back' to objects with an asymmetry along at least one of their horizontal axes. We suggest that the identification both of intrinsic fronts and backs for intrinsically oriented, but non-human, bodies and of extrinsic fronts and backs of all objects is governed, in general, by the following three basic principles:

1. the very common principle of anthropocentric and egocentric extension working throughout the semantic system of a language (cf. § 4.2),
2. the principle of confrontation or canonical encounter, and
3. the principle of locomotion in the direction of maximum perceptual field (derivative of canonical position).

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1 This discrepancy between the variability of the extrinsic front-back axis of an object and the constancy of the extrinsic vertical axis of an object was explicitly recognized by Hjelmslev, who accounted for it in terms of a difference along the dimension of 'subjectivité'- 'objectivité'. He explains and illustrates the nature of this dimension as follows (Hjelmslev, 1935: 132-3): "Une relation entre deux objets peut être pensée objectivement, c'est-à-dire sans regard à l'individu pensant, et elle peut être pensée subjectivement, c'est-à-dire par rapport à l'individu pensant... En disant l'oiseau est derrière l'arbre ou l'oiseau est devant l'arbre j'indique d'ordinaire la situation relative de l'oiseau et de l'arbre par rapport à moi-même comme spectateur... Si d'autre part je dis l'oiseau est sous l'arbre, l'oiseau est au-dessus de l'arbre, je suis sous l'arbre, je désigne par ces expressions la situation relative de deux objets sans considérer le point de vue du spectateur. La différence entre devant-derrière et au-dessus-au-dessous se résume en ceci que le choix entre devant et derrière est déterminé par la place occupée par le spectateur: s'il change de place par rapport aux objets considérés, ce qui était devant peut devenir derrière et inversement, alors que le choix entre au-dessus et au-dessous n'est pas déterminé par la place occupée par le spectateur et en reste indépendant." Hjelmslev then goes on to point out that whereas au-dessus and au-dessous are invariably used to express an objective relation, devant and derrière may be used both subjectively and objectively (as well as neutrally): "C'est ainsi que devant la maison et derrière la maison sont des expressions utilisables indépendamment de la place occupée par le spectateur, par le fait qu'une maison possède en elle-même un devant et un derrière..." (ibid.: 134). Cf. our analyses of 'in front of' and 'in back of' below (§ 3.3.2).
For example, 'front'/back' and 'left (side)'/right (side)' are applied to animals, by virtue of principle (1), to the degree that the animal concerned has structurally similar asymmetries along the two horizontal axes. As the canonical position for most animals is a quadripedal stance, the isomorphism breaks down particularly with respect to the application of the term 'back'. Either it denotes the spinal region between the pelvis and the neck of the animal, in which case it is the independent characterization of 'back' which is anthropocentrically extended, or it denotes the section from the pelvis to the feet, in which case it is the systemic characterization—"that part diametrically opposed to the front (i.e. the face/chest)"—which is transferred.

Articles of clothing, insofar as they envelop the human body and conform to its shape, are also structurally similar to it and have, by principle (1), intrinsic fronts, backs, tops, bottoms, left sides and right sides. (Anthropocentric extension has more specific application in this area—of 'the fingers of a glove', 'the neck of a shirt', 'the waist of a dress', 'the toe/heel/sole of a shoe'.)

Instruments such as loudspeakers, telescopes, goggles, cameras, etc. have fronts (and, usually by opposition, backs) again as a consequence of (1): they are, so to speak, appendices to or extensions of the human perceptual apparatus through which the ego can further project itself or take in more sense data.

According to the principle of canonical encounter (2), the participants face each other for optimal efficiency of interaction, as in the act of communication. That is, the intrinsic fronts of the interlocutors are in the immediate perceptual field of each other. This situation is most easily and naturally extended by principle (1)
to situations where the speaker/observer is confronting an object rather than an interlocutor, but one which (a) like humans, has an inherent asymmetry in one horizontal dimension and (b) is such that, like a human interlocutor, only one of its two extremities defined by this axis is normally and consistently confronted, regarded, or operated by the speaker/observer for reasons predictable from the structure or function of the object itself. We include in this set such objects as television sets, typewriters, pianos, desks, pictures, envelopes, books, houses. The intrinsic fronts of these objects can receive independent characterizations—e.g., the front of a television being the side containing the screen, the front of a piano or typewriter being the side with the keyboard, the front of a house being the side with the principal entrance—and such characterizations reveal the motivation for an extension of the principle of canonical encounter to situations involving such objects as these as "interactants".

Similarly, the front of the interior of a church, lecture room, or concert hall is that part consistently confronted by the congregation, or audience by virtue of the fact that it is the place normally containing their interlocutor or interactant—the minister, lecturer, or performers.

When the object being confronted has no asymmetrical horizontal dimension (e.g. a ball, a box) and/or is not consistently regarded from any particular side, then it can have only an extrinsic front and back. That is, principles (1) and (2) apply here most generally to assign a temporary, subjective front (and, by opposition, a back) to the side closest to the observer, i.e. to the side corresponding positionally to the face of a would-be interlocutor in a canonical encounter. As which sides are the extrinsic front and back will vary with both time
and observer, it is not so surprising that although they enter into the specification of locative relations, they are not usually denoted by the nouns 'front' and 'back', respectively. Rather, the extrinsic front of an object is predictably denoted by the deictic expression 'this side', whose denotation is explicitly tied to the identity of the speaker and the time of utterance. We will also see, in the following section, that objects with intrinsic fronts and backs may be assigned extrinsic fronts and backs which do not coincide with the intrinsic ones.

Let us now consider the application of principle (3). When a human being moves, he generally does so in a manner enabling him to constantly confront his goal or the point of reference which determines his direction of travel. Thus, his intrinsic front is (usually) always closest to this point. In the case of non-intrinsically oriented objects in motion—balls, stars, symmetrical vehicles (canoes, trams, rafts, hot-air balloons)—the same rule applies: the side 'leading the way' is the extrinsic front. Most moving objects—passenger vehicles (such as cars, trains, ships, bicycles, airplanes), arrows, bullets—have conventionalized intrinsic fronts derivative of this rule: one end of the object, for functional or structural reasons, is consistently closest to the goal when the object is in motion. Principles (1) and (3) are sufficient to account for these cases, and it therefore seems unnecessary to appeal to such psychological processes as suggested by Collinson (1937: 51): "In the case of an object like a vehicle built of a shape to enable it to travel normally in one direction, the speaker assumes himself to be going to the goal and thus indicates a **front-part** (forward on board ship) and a **rear-part** (aft)...." (Note incidently that in the case of a row-boat the intrinsic or
conventional front-back axis is exactly opposite in direction to that of the rower. This doesn't, of course, contradict Collinson since the rower is nevertheless travelling in the same direction as the boat.)

What should be pointed out, however, in connection with extrinsic fronts and backs of moving objects which are determined by principles (1) and (3), is that they are not subjective in the sense that those determined by principle (2) are. That is, although they may vary with time, they do not vary with the observer. Hence, they are mid-way between the constant, intrinsic front and back of an object and the variable, extrinsic ones assigned by confrontation (cf. the non-subjectivity of extrinsic tops and bottoms). ¹

¹ Other artifacts, such as chairs and sofas, designed to support the human body in a sitting posture (which is a slight deviation from canonical position) have backs, right sides and left sides to the extent to which they, like clothes, mould to those parts of the body. The front of such objects can be regarded as either the extremity opposed to the back so defined or the side usually confronted. And there is no conflict in the two different ways of assigning 'front', just as there is no conflict in the front of the human body being either the side containing the perceptual apparatus or the side normally confronted.

Beds, coffins, graves, sleeping bags, etc., comprise an interesting set of objects in that they have both a head and foot and a left side and right side, defined with respect to the locations which the corresponding body parts occupy when the objects are being used for their normal purposes, but no intrinsic front and back. Moreover, they have an intrinsic top and bottom, congruent with the head and foot, or an extrinsic top and bottom defined in terms of gravitational vertical.
What we should like to re-emphasize at this juncture is that it is very difficult, if not impossible, to separate the conventionalization of various extremities of objects as the front or back by means of some structural differentiation (as, for example, putting drawers in one side of a desk or placing a head-board at one end of a bed), and hence the definition of these extremities independently in terms of physical characteristics, from the fact that such objects have a particular side which is consistently confronted or which consistently leads the way when the object is moving, and hence the definition of these intrinsic extremities internally, with respect to the vectorial, three dimensional system. For example, a hollow canoe has no intrinsic front and back: it is lengthwise symmetrical and can be paddled with either end leading the way (i.e. as the extrinsic front), usually by paddling from opposite ends. However, if a seat is constructed at one end, so that one need not kneel while paddling, then the opposite end will come to be consistently the one leading the way or the extrinsic front—i.e. the canoe will have an intrinsic front and back. Similarly, just as it is not an accident that people face each other when interacting, so it is not an accident that one side of a television set (that with the screen) rather than another is the intrinsic front, the consistently confronted side. Thus, although it may be possible to deduce how the three principles above are involved in extending the expressions 'front' and 'back' to non-human objects, this does not exclude the possibility that there may be semantic properties of the nouns denoting these objects which would themselves predict which side will be the one confronted or the one leading the way, i.e. which will be the intrinsic front. However,
the crucial consideration is that the same entity can be considered from two points of view—e.g., a desk and a table—and that the function is decisive in default of structural asymmetry.

We can try to summarize some of the preceding discussion and, in particular, to capture how principles (1), (2), and (3) appear to be involved in the application of the relational terms 'front' and 'back' to particular extremities of objects by means of the following informal definitions of the semantic formulae corresponding to these terms.

Because of the tentativeness of these definitions and because many of their terms require further explanation, we will not give them a formalized rendition: at this point, little would be gained by such an exercise and probably much more obscured. $FR_1()$ and $FR_e()$ are functions whose domain is the set of objects. The value of $FR_1(X)$ is the intrinsic front of $X$; the value of $FR_e(X)$ is the extrinsic front of $X$. The latter function is further differentiated into $FR_{e/o}( )$, i.e. the extrinsic front by confrontation, and $FR_{e/m}( )$, i.e. the extrinsic front by movement. For each of these to be defined, certain contextual requirements must be met: in the case of $FR_{e/o}(X)$, $X$ must be observable or, at least, perceptible by some human, $Y$; in the case of $FR_{e/m}(X)$, $X$ must be in motion. Theoretically, at least, both conditions could hold simultaneously so that the object had two (not necessarily coincident) extrinsic fronts. For $FR_{e/o}( )$ and $FR_{e/m}( )$ to have the properties of functions—i.e. that they assign a unique front to each object in their domains—they must be 'tensed', i.e. $FR_{e/o}( )$ must be restricted to the time at which the object is being observed or is observable (by $Y$) and $FR_{e/m}( )$ must be restricted to the time at which the object is in motion. Thus, which extremity
is the extrinsic front in each case may vary with time since Y's position may vary with time and which side of the object is leading the way may vary with time. Furthermore, in the case of $FR_e/o(Y)$, which extremity is the front will also depend upon the identity of Y. With these restrictions in mind, $FR_e/o(X)$ and $FR_e/m(X)$ will each uniquely specify an extrinsic front of X. Returning now to the specification of intrinsic fronts, we can differentiate $FR_1(Y)$ according to whether it is determined independently of principles (1) to (3), i.e. whether its domain is the set of humans, or whether it is derivative of one or more of the three principles. This differentiation is included in the following set of definitions, but it is questionable whether it is linguistically relevant. The suggested definitions, then, are given in 70.

70. a. $FR_1(X) =$ the extremal portion\(^1\) of X extending from head to foot in which is concentrated the perceptual apparatus. Contextual Requirement: X is human

b. $FR_e/o(X) =$ the extremal portion of X which, if X were a human, Z, in canonical encounter with Y, would predictably be $FR_1(Y)$. Contextual Requirement: X is observable by Y

c. $FR_e/m(X) =$ the extremal portion of X which, if X were a self-locomoting human, Z, would predictably be $FR_1(Z)$. Contextual Requirement: X is in motion

\(^1\) X is an extremal portion of Y if X is a part of Y and part of X is part of the (external) surface of Y. We can define the surface of an object Z as the set of all points which are part of Z and which are in contact with the complement of Z (i.e. what is not Z). A distinction between the external and internal surfaces of an object appears to be necessary to distinguish between such expressions as 'on the outside of the box'/'on the inside of the box'. Some component of "normally visible" would seem to play a part here. Cf. too fn. 1, p. 98.
d. $FR_{1/a}(X) = \text{the extremal portion of } X \text{ more or less isomorphic with } FR_1(Z), \text{ where } Z \text{ is human.}$

Contextual Requirement: $X$ is non-human but human-like in shape (i.e. we have to do here with anthropomorphic extension.)

e. $FR_{1/o}(X) = \text{the extremal portion of } X \text{ which is consistently } FR_o(X).$ Contextual Requirement: $X$ is non-human and is asymmetrical along a non-vertical axis.

f. $FR_{1/m}(X) = \text{the extremal portion of } X \text{ which is consistently } FR_e/m(X).$ Contextual Requirement: $X$ is non-human and is asymmetrical along a non-vertical axis.

Given a tacit understanding of the nature of and the reasons for canonical position, encounter and locomotion, the principle of anthropocentric extension, and what underlies the phenomenon whereby one side of an object is 'consistently' the one confronted or the one leading the way, we can vastly simplify 70.a. through f., yielding 71.a., b. and c.

71. a. $FR_e/o(X) = \text{the extremal portion of } X \text{ which can be seen by the observer } Y, \text{ i.e. which is closest to } Y$

b. $FR_e/m(X) = \text{the extremal portion of } X \text{ which is leading the way, i.e. which is closest to the 'goal' of } X's \text{ movement}$

c. $FR_1(X) = \text{the extremal portion of } X \text{ which is consistently } FR_e/o(X) \text{ and/or consistently } FR_e/m(X)$

The different applications of 'back' are parallel to those above for 'front' and the semantic functions ($BK(X)$) can be defined, in each
case, as the extremal portion of $X$ diametrically opposed to $FR(X)$.

For the top of an object we have the (simplified—cf. 71.) definitions given in 72.; and, again, the bottom of the same object is the extremal portion diametrically opposed to the top. We will postpone the characterization of the left side and right side of an object.

72. a. $TP_e(X) = \text{the extremal portion of } X \text{ parallel with the ground and gravitationally upwards with respect to the diametrically opposed extremal portion of } X$

b. $TP_i(X) = \text{the extremal portion of } X \text{ which is consistently } TP_e(X)$

(intrinsic and extrinsic) until the next section, when we can consider some of the locative and directional expressions in which 'left' and 'right' occur, for the situation in the case of these extremity terms is somewhat more complex and less clear-cut than it
The applicability of such expressions as 'upside down' and 'back to front' appear to depend on the possession by the object concerned of an intrinsic orientation along the relevant axis. 'Back to front', moreover, presupposes a second object with an intrinsic orientation along the same axis; a sweater is not back to front until it is on someone with a front and a back. 'Upside down' on the other hand, presupposes gravitational vertical with its own and constant 'up' and 'down'. In the case of the similar expression 'inside out', it is not so much a matter of intrinsic orientation as of possession by the object of an inside and an outside surface (cf. fn. 1, p. 95). Thus, if one can talk about something being on the inside or the outside of an object, then, granted the object has the necessary flexibility to be distorted in such a way, one can, in general, also talk about that object being inside out—cf. 1. and 2.

1. a. The title is written on the inside of the record
   b. The record is inside out

2. a. The title is written on the inside of the LP jacket
   b. The LP jacket is inside out

If we compare 'upside down' and 'inside out' with 'back to front', the latter appears to be the odd one out. In the first two expressions the initial element denotes the positive member of an opposing pair of parts of the object (the top versus the bottom, the inside versus the outside) while in the latter it denotes the negative member (the back versus the front). And, in general, we do not get 'downside up', 'outside in' and 'front to back'. However, there is another way of looking at the data. First of all, it is not entirely clear that 'inside' is indeed the positive member of the pair 'inside'/ 'outside'. Certainly if these are being used deictically (as adverbs), then 'inside' could be related to 'here' (positive) and 'outside' to 'there', with 'side' perhaps denoting the boundary of the space around the ego (Lyons, personal communication). However, in more neutral situations, it is the outside of an object which is normally observed or observable (by the ego as well as others), and this fact would tend to determine 'outside' as the positive term (cf. H. Clark, 1973). Now if this is the case, then it is 'upside down' which is the exception. Furthermore, 'inside out' and 'back to front' are now seen to share the common property of being applicable when the observer is able to see a part of the object he doesn't normally see. Given the principle of confrontation, an object is normally observed from outside and from the front. Thus, it is not too surprising that if the observer is not in canonical encounter with the object presupposed by the object which is described as being back to front (cf. above)—for example, if the observer is looking at the back of another person—then 'front to back' is much more acceptable. Consider sentence 3. in this context—i.e., it is the front of the sweater which is visible to the observer if he is looking at the back of John.

3. John's got his sweater on front to back
Such definitions as those in 70. (and 71. and 72.)—or their necessary refinements—are claimed to be natural ones in the sense that they give a principled account of how the terms 'front', 'back', etc. can be applied implicitly or explicitly to all kinds of objects and to a single object in more than one way on the basis of essentially universal and extra-linguistic phenomena such as the structure of the human body, the characteristics of social interaction and other human behaviour (posture, self-locomotion), and the psychological centrality of the ego and its role in metaphorical extension. Although there are logically equivalent definitions for at least some of these extremities (the extrinsic ones) in terms of systemic distinctions in a three-dimensional semantic field of space (cf. the definitions of Teller (1969) and Leech (1969)), once this is done, there is no longer any means of relating these to the definitions of intrinsic extremities—the addition of such features as +PROMINENT or +NORMAL (cf. Teller, 1969) explains nothing. Nevertheless, the logically equivalent alternatives exist, as part of the total semantic system, and may be more appropriate as statements of the sense relations holding both between the members within each set of expressions with which we began this discussion—locational, directional, extremity-identifying—and between corresponding members from each of the three sets. However, let us not belabor this question any further and instead move on to a discussion of semi-direct location and its realization, assuming that our extremity functions can be given explicit characterizations. In the case of the front and back of an object, we need only distinguish
We have not considered the problem of distinguishing 'front' as denoting a part from 'front' as denoting an extremity. Instead, we have combined both "part" and "extremity" in our definition of 'extremal portion' (cf. fn. 1, p. 95). Teller (1969: 206) suggests that the two may be distinguishable by specifying whether the portion involved has a dimensionality equal to or less than the dimensionality of the whole. Leech (1970: 178) considers this possibility but decides in favour of distinct relations: "is a part of" and "is an extremity of". However, it is not entirely clear that this distinction need be made at all in the definition of 'front' (and the other extremity terms) as it may be predictable from the context, more specifically, from the preposition which occurs before it. Thus, in 1., whether an extremity or part is involved is derivative of whether 'on' or 'in' is used, since 'on' selects the surface of an object, and 'in' selects the interior. In 2. we have the unmarked interpretation of 'at', in which case the distinction is irrelevant, and either 'on' or 'in' may be substituted for it. However, in this case, pragmatic factors are such that both the horizontal and vertical surface of the top portion of the tower can feature in the interpretation (and this latter surface would not be a top extremity in Leech's system)—cf. 3. In 4., the unmarked use of 'at' is compatible with either an 'in' interpretation—in which case it is the interior of the front part of the bus which is involved—or a marked 'at' (as 'atz') interpretation—in which case it is the periphery of the front part of the bus (considered as a barrier) which is selected (i.e. the luggage is sitting just outside the bus). Similarly in 5., but here it is 'on' which is compatible with unmarked 'at'.

1. A gull has built its nest (on the top of the lighthouse tower
in the top of the lighthouse tower

2. Vandals have painted obscenities (at the top of the tower
on the top of the tower
in the top of the tower

3. The vandals painted obscenities on the top of the lighthouse tower and these could be read by low-flying airplanes by ships several hundred yards from shore

4. There was some luggage (at the front of the bus
in the front of the bus

5. The dancer is standing at the side of the stage
3.3.2 'In front of', 'in back of', 'over', 'under', 'on the left of', 'on the right of'

For each extremity of an object we have looked at, it is possible to define a spatial region which would be its natural extension in space. The nature of such 'spatial reflexes' (SR) can be made more explicit by a diagram. If we consider the ideal situation of a cubical object, $X$, as in Figure II, with a front, top, and left side as labeled, then the spatial reflex of the front of $X$—i.e. $SR(\text{FR}(X))$—is that region contiguous with the front of $X$ such that it extends forwards from the front (i.e., in the positive direction along the front-back axis of the cube) and every cross-section is congruent with the front. Similarly with the other extremities. For less ideal objects, the relevant cross-section would be that of the silhouette of the object seen from the front, back, etc. The same principle of spatial extension applies both to planar figures (the spatial reflexes being, in that case, areas) and to linear objects (the two spatial reflexes being the extension of the line in each direction).

This notion of spatial reflex is vague insofar as the outermost
boundaries of a given spatial reflex are indeterminate—does the region extend indefinitely, or as far as the eye can see, or is there some other contextually determined limit? We will leave this question open but will assume that there is one and only one well-defined spatial reflex of an extremity in any particular context. Thus, we will be able to treat it as a function. Furthermore, although we have given a rather rigid, geometrical characterization of spatial reflexes, in reality their other boundaries must be allowed to be slightly elastic, but not too much so, in order to accommodate the ordinary use of language which does not come up to the standards of geometrical precision.

Let us now look at the pair of expressions 'in front of'/'in back of' (or 'behind'—cf. §3.4.2). Leech (1969: 23) considers these to constitute a converse pair denoting opposite ordering relationships between the denotata of the two noun phrases involved. His motivation for this is the alleged equivalence of 73. and 74. below (cf. too

73. The bus is in back of the car
74. The car is in front of the bus

Gruber, 1965: 34). However, the equivalence of these two sentences is by no means necessary since 73. can be consistent also with 75.

75. The car is in back of the bus

(which would appear to be the contradiction of 74.) or with 76.

76. The car is to the side of the bus

Furthermore, the conjunction of 73. with 75. is logically equivalent (though not necessarily identical) to the reciprocal construction in 77.; and reciprocal constructions are symmetric and therefore
77. The bus and the car are in back of each other definitely non-ordering. The three possible situations (denoted by the conjunctions of 73. with 74., 75., and 76.) are sketched in Figures III, a., b., and c., respectively.

Figure III

What is involved here is not an ordering relationship (indirect location) between the car and the bus, but a relation of semi-direct location of the bus with respect to the back of the car. This can be characterized by incorporating the notion of the spatial reflex of an extremity of an object into the definitions for 'in front of' and 'in back of', as given in 78. These semantic representations can be

78. a. 'A in front of B': A loc INT(SR(FR(B)))
   b. 'A in back of B': A loc INT(SR(BK(B)))
glossed as "A is in the spatial reflex of the front of B" and "A is in the spatial reflex of the back of B". These definitions reveal that nothing is guaranteed about the semi-direct location of B with respect to A, and this is what is demonstrated in Figure III.

However, we have not exhausted the possible situations to which 73. can refer. One more, at least, exists—for example, the conjunction of 73. with 74., 76., and 79., below. This situation is illustrated in Figure IV. In fact, only in this last situation, where
79. The bus is to the side of the car

Figure IV

we have an implicit (or explicit—cf. 80., 81.) point of observation,

80. Looking from here, the bus is in back of the car
81. Looking from here, the car is in front of the bus

does the semantic relation of equivalence hold invariably between 73. and 74. (and, derivatively, the converse relation between 'in front of' and 'in back of'). The existence of a point of observation adds the semantic information that the front and back (of the bus and car, respectively) which are involved in the situation denoted by 73. and 74. (or 80. and 81.) are extrinsic ones, more specifically, ones deriving from confrontation by an observer. Thus, if either of 80. or 81. holds, then the front-back axes of both objects under observation must be aligned in the same direction since both are being confronted by the same observer at the same moment. And if the directions of the front-back axes of both objects are identical, then the converse
relation necessarily holds.¹

If there is no explicit mention of a point of observation, but it can be determined that the two objects in the relation are both intrinsically unoriented—i.e., have no intrinsic fronts and backs—and are not in motion, then again only extrinsic fronts and backs can be involved, and the converse relation can be predicted to hold between 'in front of' and 'in back of'. Thus, 82. implies 83., and

82. The stool is in front of the playpen
83. The playpen is in back of the stool
vice versa.

¹ To see this, consider first the situation described by 'A in front of B'. All we can infer about such a situation is what is diagrammed below, where the slanted lines represent the spatial reflex of the front of B (and FR(B) may be intrinsic or extrinsic, as far as we know). If we now add 'seen from X', i.e., a point of observation, then we know that both A and B are confronted by X and that the front of B (now known to be extrinsic) is closer to X than is its back, i.e., we have the situation below. In this situation, A will also have an extrinsic front from confrontation by X and, by opposition, an extrinsic back. And if A has a back, then there is a spatial reflex of that back, indicated below by the slanted lines in the opposite direction. This spatial reflex of A's back will necessarily include B, and therefore 'B in back of A' will also hold.
When we are considering intrinsic fronts and backs, whether or not the converse relation holds is accidental (and trivial) in the sense that the facts of the situation denoted may be contingently such that both 'A in front of B' (FR₁(B)) and 'B in back of A' (BK₁(A)) are true. This will be the case when the intrinsic front-back axes are both oriented in the same direction. This may be derivable from the textual context—for example, if 73 was prefaced by 84. Other contexts would just as easily enable one to predict the compatibility of 73 with 75 (the car and the bus must face in opposite directions) or with 76 (their orientations must be neither matching nor opposing); but 73 remains inherently ambiguous.

The cases where intrinsically unoriented but moving objects are concerned are the same as for intrinsically oriented objects—cf. 85 and 86—but such situations are more difficult to find or fabricate since most moving objects which we talk about have intrinsic fronts and backs. However, intrinsically oriented objects may function as unoriented if so conceptualized or perceived. Otherwise, there may be a conflict in the intrinsic and motional axes; and although this can receive linguistic expression in the case of describing one object—cf. 87—in the case of describing the spatial relation between two moving objects both of which are moving contrary to
canonical locomotion, the expressions 'in front of' and 'in back of' become difficult to interpret—cf. 88. Furthermore, in the case of

88. Both Sally and Fred are skating backwards and Sally is in front of Fred

moving objects, 'ahead of' is much more natural than 'in front of' (and 'behind' more natural than 'in back of', in those dialects which have both—cf. §3.4.2).

When one extrinsically unoriented object and one moving or intrinsically oriented object are involved, the problem is still more complex; but, in general, it is again only when the extrinsic orientations of both objects are considered that the converse relation holds and the implication between 'A in front of B' and 'B in back of A' truly bilateral.

To summarize, the converse relation holds between 'in front of' and 'in back of' only when it is the case that the absolute directions of the front-back axes of the two objects involved in the situation are identical. And this can be guaranteed to hold only if we are concerned with extrinsic fronts and backs—that is, only if (a) there is explicit or implicit reference to a point of observation and/or (b) the two objects are intrinsically unoriented, stationary objects. Since the bilateral implication in such cases is deducible from the definitions given in 78, and the principle of confrontation (cf. fn. 1, p. 105), we can claim that converseness is not an inherent part of the senses of this pair of terms. Rather, it is a contextually introduced (and, in a well-defined class of cases, a predictable) semantic property. Thus, 'in front of' and 'in back of' are inherently ambiguous according to the different ways of establishing the fronts and backs of objects,
all of which are collapsed in the definitions in 78. as FR(X) and BK(X).

This holds as well for the logical property of transitivity, which again is not an inherent property of either of these terms. But, under exactly the same conditions as above—i.e., when the directions of the extrinsic front-back axes of all the objects involved, or the intrinsic front-back axes of all the objects involved, are aligned—transitivity will (trivially) hold. Thus, the conjunction of 89. and 90. below (uttered by the same speaker/observer at the same place and time) implies 91. since only extrinsic (by confrontation) orientations of the trees can be involved. However, the same logical relation does not hold between 94. and the conjunction of 92. and 93. Although

92. Ken is in front of Chris
93. Chris is in front of Wayne
94. Ken is in front of Wayne

in some situations all three may be true, this will be an accident and no reflection of the logical properties of 'in front of'.

We can mention two further points about the definitions given for 'in front of' and 'in back of'. First, the reciprocal construction, which can be analyzed as a reduction of the conjunction of 'A in front of B' and 'B in front of A' (and similarly for 'in back of'), is possible only when the fronts and backs of the objects are both intrinsic. (If they are both motional-extrinsic, then the situation
tends to be encoded as, for example, in 95. and 96., although the

95. The two frisbees are approaching each other
96. The two frisbees are flying away from each other

static locative reciprocal relation would still be implied.) Thus,
97. and 98. cannot be reduced to 99. since in 97. the front of the

97. John is in front of the tree
98. The tree is in front of John
99. *John and the tree are in front of each other

tree is necessarily extrinsic while, if consistent with 97., the front
of John in 98. must be intrinsic (i.e. John is facing the tree).
However, rather than being derived from a simple conjoined structure,
reciprocal constructions appear to be more appropriately described as
involving a quantified structure at a deeper level of analysis (cf.
Anderson, 1974). If we adopted such an approach, 'A and B in front
of each other' could be analyzed, very roughly, as "for each ordered
pair \((y,z)\) in \(A,B \times A,B\) such that \(yz\), it is the case that
whose \(\text{loc } \text{IN} \text{C(SR(FR(z))))}\). Sentences such as 99. would then be naturally
excluded since they would require \(\text{FR}(z)\) to fluctuate in its inter-
pretation within the scope of the quantifier.

Secondly, sentences with *in front of* are odd, if not unaccept-
able, when they describe a situation in which an object is given an
extrinsic front under the observation of some person (the speaker,
usually) who then locates himself with respect to that front—as in 100.

100. *'(Looking from here) I'm in front of the tree
101. (Looking from here) Jane is in front of the tree
102. (Looking from there) I'm in front of the tree
where the extrinsic front of the tree is induced by someone other than the person being located (Jane) and where it is induced by someone other than the speaker--e.g. the addressee). Such situations are more naturally encoded either as 103, or as 104. This phenomenon is all the more striking in the case of 'in back of'--105. is definitely unacceptable since if the observer has his back to the tree, he cannot induce an extrinsic orientation upon it (i.e. he is not confronting it) and, alternatively, if he has induced an orientation on the tree (by confronting it), he cannot simultaneously be in back of it. The situation concerned must be expressed by a sentence such as 106, or 107.

I've got my back to the tree
The tree is in back of me

Interestingly enough, the literal translation of sentence 100, into German, using 'vor', is perfectly acceptable and not too uncommon.

1 It may be argued that 103 and 104, in contrast to 100, no longer answers the question Where are you? but rather How are you oriented with respect to the tree? However, it is not absolutely accurate to say that 100, does indeed answer the first of these questions. In actual fact it is entirely uninformative, hence its dubious acceptability, as regards the location of the speaker ("I"): the only information which can be derived from it by implication is the orientational relation encoded in 103, or 104, (cf. §3.4.2).
But, as we would expect, no 'hinter' counterpart exists, an observation which Dreike's (1974) discussion of 'vor' and 'hinter' leaves unexplained. Thus, to use her examples, 108. below has, as one of its readings,

108. Maria steht vor dem Auto

"Maria is facing the car" while 109. does not permit the reading

109. Maria steht hinter dem Auto

"Maria has her back to the car". In Dreike's analysis, this "facing" interpretation of 'vor' required breaking the pattern whereby the locative relation expressed by this preposition is analyzable in terms of the front of the second argument: she is led to distinguishing a 'y-intrinsic' interpretation ("determined by the inherent structure or locomotive potential of the denoted object in the 2nd argument") and an 'x-intrinsic' interpretation ("determined by the face of the x-argument"). However, it appears that (as might be expected) this interpretation of 'vor' occurs only when the object being located is a human, or perhaps an animal, with eyes, i.e. capable of confronting the other object and inducing a front on it. Thus 110. is not acceptable under the interpretation of 'vor' as

110. Der Fernseher steht vor dem Tisch

"facing" or "has in front of it". Now, bearing in mind the above observations for English, we can suggest a simpler analysis of this interpretation of 'vor' which does not require making such a distinction as that made by Dreike and which also accounts for the non-occurrence of an 'x-intrinsic' interpretation of 'hinter': in the present framework, 'x-intrinsic' is just the special (and, in German, acceptable) case of the confrontation interpretation of 'vor'—where
the observer and the object being located are one and the same.

Let us now turn our attention briefly to locative expressions involving the extremity-identifying expressions 'left' and 'right'. These establish the secondary horizontal axis. The situation is complicated here because of several factors. First of all, there is a rather large set of prepositional phrases involving these items, not all of which are acceptable for all speakers of the language. Most of the various possibilities are illustrated below. The reader may find more of these sentences deviant than have been marked as such.

111. a. Our house is the one left of the elm tree
   b. Our house is the one left of the post office
   c. John is the one standing left of Fred

112. a. Our house is the one to the left of the elm tree
   b. Our house is the one to the left of the post office
   c. John is the one standing to the left of Fred

113. a. Our house is the one on the left of the elm tree
   b. Our house is the one on the left of the post office

114. a. Our house is the one to the elm-tree's left
   b. Our house is the one to the post-office's left
   c. John is the one standing to Fred's left

115. a. Our house is the one on the elm-tree's left
   b. Our house is the one on the post-office's left
   c. John is the one standing on Fred's left

116. a. Our house is the one at the left of the elm tree
   b. Our house is the one at the left of the post office
   c. John is the one standing at the left of Fred/the stage

117. a. Our house is the one at the elm tree's left
b. Our house is the one at the post-office's left

c. John is the one standing at Fred's left/the stage's left

118. a. Our house is the one on/at the left-hand side of the elm

b. Our house is the one on/at the left-hand side of the post office

c. Our house is the one on/at the left-hand side of the street

d. John is the one standing on/at the left-hand side of Fred

e. John is the one standing on/at the left-hand side of the stage

119. a. Our house is the one on/at the left side of the elm

b. Our house is the one on/at the left side of the post office

c. Our house is the one on/at the left side of the street

d. John is the one standing on/at the left side of Fred

e. John is the one standing on/at the left side of the stage

120. a. Our house is the one in the left(-hand) side of the street

b. John's letter is in the left(-hand) side of the drawer

121. a. Our house is the one to the left(-hand) side of the elm

b. John is the one standing to the left(-hand) side of Fred

Sentences 114.a., 115.a., and 117.a. are probably unacceptable in all dialects and 114.b., 115.b., and 117.b. in most. This would tend to suggest that the possessive construction with 'left' and 'right' requires that the left and right sides involved in the situation be
intrinsic (or inalienable—cf. Fillmore, 1968: 80) and that there is some doubt whether such objects as post offices, for example, have intrinsic left and right sides in addition to their intrinsic fronts.

Secondly, we have a mixture of locative expressions in 111. to 121., some being direct locatives in which the location object is an extremity or part of some object (e.g. those beginning with 'at', 118.a., 119.c., 120.b.), some semi-direct locatives (e.g. 113., 115.), and some indirect locatives (e.g. 111. and those prefaced with 'to'). These latter two can be distinguished by the possibility of co-occurrence with 'further' (i.e., in comparative structures); this element may modify indirect locatives since they are underlyingly ordering relations. The co-occurrence possibilities are illustrated in 122. and 123.

122. a. Our house is further \{left of\} the elm tree than yours is
   b. John is standing further to Fred's left than Mary is

123. a. Our house is further on the left of the post office than yours is
   b. John is standing further on Fred's left than Mary is

Finally, though not exhaustively, there are difficulties in specifying the left and right sides for intrinsically unoriented objects (like elm trees) and also for many objects which have intrinsic fronts and backs deriving from confrontation (like post offices). This problem has been discussed in the recent literature. Leech (1969: 167) observes that there is "a curious discrepancy between the "field of vision" [=confrontation] interpretation and the "mobile object" interpretation, in that the relation of 'left' and 'right' to
the primary axis is reversed". Lyons (forthcoming: 303) adds that "this derives from the fact that what is on the right of the observer will be on the left of a moving object approaching the observer".

H. Clark (1973: 467) suggests an explanation for the failure of 'left' and 'right' to follow the "proper rules of canonical encounter" (by 'proper' we must assume that Clark means the attribution of all the orientational characteristics of a hypothetical interlocutor to the reference object): "If one says, Mary is to the right of the tree, one would mean "Mary is on the right with respect to me." One does not take the view of the tree, decide what is left and right in that position, and then reverse the application of left and right as one should. The reason for this failure to reverse is not clear. Perhaps it is because the left and right directions in space are symmetrical, so the terms are difficult to apply to objects in a canonical encounter. We have no trouble with the asymmetrical pairs top-bottom and front-back in this situation, because their criteria for application are intrinsic to the asymmetries in the situation. But left and right, even in their normal use, are applied under fairly arbitrary criteria; the reversal of this application in a canonical encounter would seem unnecessarily complex."

Our aim here is not to further such discussion and speculation, nor to account for all the variations exemplified in 111. to 121. Rather, we wish to make a first step towards systematizing the facts for those cases in which judgments are relatively clear-cut.

We can begin with intrinsically oriented objects which are either humans, objects shaped like or supporting humans (and which can therefore, by anthropomorphic extension, be assigned left and right sides according to the position of these in the human body), or objects with
intrinsic fronts due to locomotion and serving as passenger vehicles such that the passengers face in the direction of travel (cf. a car versus a row-boat). All of these objects may have an intrinsic left side and right side. But since these extremities (usually) have no independent structural differentiation (the left-right-axis being symmetrical), their characterization is usually a functional one (or, perhaps, a gradually learnt 'gestalt' one in terms of the relative positions of the sides with respect to the front and back and the head and feet). In English, at least, it would appear that which side is the right side and which the left is determined by which side contains the right hand and which the left hand, respectively (cf. 'right/left-hand side'); and hence it is the latter (the left or right hand) which is functionally specified. For most speakers of English, the right hand is the functionally prominent hand, the skilled (e.g. for writing, sewing, etc.) or stronger hand. But for the so-called 'left-handers', it will be the left hand which is so characterized. A more constant functional definition might be in terms of some culturally prescribed function: the right hand is the hand one eats with or handles certain pieces of cutlery with or shakes hands with.¹

¹ In many languages such functional determinants are more transparent. Thus, in the Telugu 'kudi ceyi' (='right hand'), 'kudi' is related to the verb 'kuducu', meaning "to drink or eat". In colloquial Tamil we find 'cottu kai' (='right hand'), literally "meal/rice hand", and 'piccan kai' (='left hand'), literally "shit hand". In literary Tamil, 'vala tu' (='right hand') is diachronically "the strong hand" and 'ita tu' (='left hand'), "the remote hand". In an older form of Japanese, 'mete' (='right hand') is "the horse hand" (i.e. for holding the reins of the horse) and 'yumite' (='left hand') "the bow hand".
If there is a gestalt characterization, then it is most likely acquired via the intermediary of functional ones. We can suggest therefore the following (individual-specific) characterization of the right side of a human ($RS_1(X)$). The left side ($LS_1(X)$) will be defined as the diametrically opposed side. (For left-handers, the positive specification will be for the left side and the right side will be defined by contrast to it.)

124. $RS_1(X) = \text{the extremal portion of } X \text{ on the non-vertical axis perpendicular to the front-back axis which contains the functionally prominent hand}$

For non-humans, we have the tentative, anthropomorphic characterization of $RS_1(X)$ given in 125. Again, it is questionable whether

125. $RS_{1/[a]}(X) = \text{the extremal portion of } X \text{ in the same structural relation to the } FR_{1/[a]}(X) \text{ and } TP_{1/[a]}(X)$

as the $RS_1(Z)$ is to the $FR_1(Z)$ and $TP_1(Z)$, where $Z$ is human.

these objects have truly intrinsic left and right sides.

Expressions of the form 'to/on/at A's left/right' involve unambiguously this intrinsic type of left and right sides, but they appear to be restricted in their application to situations in which $A$ is human. For non-human $A$'s, we have the alternative adnominal construction 'to/on/at the left/right of $A$', but these may be ambiguous between an intrinsic and an extrinsic interpretation of 'left' and 'right' (cf. below). For 'A on the left of B' (in an intrinsic interpretation) and 'A on B's left', we have definitions comparable to
those of "in front of" and "in back of"—cf. 126. The direct

126. a. 'A on the left of B': \[ \text{A loc INT(SR(\text{LS}_1(X)))} \]

b. 'A on B's right': \[ \text{A loc INT(SR(\text{RS}_1(X)))} \]

locative expressions 'at A's left' and 'at the left((-haml) side) of', when acceptable, are interpreted according to the marked and unmarked uses of 'at'—cf. fn. 1 p. 100.

Let us now consider a sentence like 127. Which tree is identified

127. The elm tree is the one on the left of the oak

as the elm will depend upon the observation point. More specifically, which side of the oak is considered the left one for the purposes of locating the elm tree with respect to it will be that side which, were the oak a reflection of the observer, would be his left side. That is, the left-right axis of the confronted object is the mirror image of that of the observer. We can give the following informal characterizations of these 'mirror-image' left and right sides as in 128.

128. a. \( \text{LS}_{m-1}(X) = \) that extremal portion of \( X \) which is on the same side of the axis joining \( X \) with its observer \( Y \) (i.e., the line of observation) as is \( \text{LS}_I(Y) \)

b. \( \text{RS}_{m-1}(X) = \) that extremal portion of \( X \) which is on the same side of the axis joining \( X \) with its observer \( Y \) as is \( \text{RS}_I(Y) \)

For objects which have intrinsic fronts derivative of confrontation, it is the definitions in 128, which apply in the characterization of their intrinsic left and right sides—cf. 129. Such objects
129. a. \( L_{i/m-1}(X) \) = that extremal portion of \( X \) which is consistently \( L_{m-1}(X) \)
b. \( R_{i/m-1}(X) \) = that extremal portion of \( X \) which is consistently \( R_{m-1}(X) \)

thus have an intrinsic left side and right side derivative of the fact that they have another side (their front) which is consistently the side confronted. However, it again does not appear to be generally the case that objects with intrinsic fronts and backs—this time due to confrontation—also have intrinsic left and right sides. Pianos, cookers/ranges, desks, typewriters do seem to have them, probably because the distinction is functionally salient and/or structurally marked. For most other objects, however, a distinction between extrinsic (mirror-image) and intrinsic seems dubious: the left and right will always be assigned, for each separate situation of confrontation, according to the mirror-image rule. It will then be a result of the objects having a front which is normally the side observed that left and right are usually assigned in the same way.

It is the extrinsic, mirror-image left and right sides which must function in the expressions 'to/on the left/right of' and 'at/on/in the left/right(-hand) side of' when the reference object does not have an intrinsic orientation. However, confusion may arise between an intrinsic (anthropomorphic) interpretation and a mirror-image interpretation of 'left' and 'right' when the reference object has an intrinsic (non-mirror image) left-right orientation. Thus, 130. can--

130. The river is now on the left of the train

but need not (e.g. if the observer is behind the train)—have contradictory interpretations. Thus, we can simplify 126.a. to 131 which
131. a. 'A on the left of B': A loc INT(SR(LS(X)))
   b. 'A on the right of B': A loc INT(SR(RS(X)))

will allow for the two interpretations, depending upon whether LS( )
and RS( ) are intrinsic or extrinsic.¹

Finally, let us look at semi-direct location in the vertical
dimension. It has been suggested that 'on the left of' and 'on the
right of', in contra-distinction to 'to the left of' and 'to the
right of', should receive semi-direct locative analyses (along the
same lines as 'in front of' and 'in back of') on the basis of their
not accepting modification with 'further'. In the case of the pairs
'over'/'under' and 'above'/'below', this same test would distinguish
the first pair as semi-direct locatives, the second as indirect
locatives. Furthermore, it has often been observed that 'over' and

132. a. *The hot air balloon is further over the television tower
    than the helicopter is
   
   b. *The scuba diver is further under the yacht than the shark

¹ A similar situation obtains in French although it is not clear
whether the same type of ambiguity can occur. The pair of expres-
sions 'à la gauche de'/à la droite de' are used when the reference
object has an intrinsic left and right side (humans, cars, etc.).
Sentence 1. can only mean that Jean is on Paul's left. On the other

1. Jean est à la gauche de Paul

hand, 'à gauche de'/à droite de' ani 'sur le côté gauche de'/sur le
côté droit de' are used, whether the reference object has an intrinsic
front or not, in the mirror-image sense of left and right. Hence,
if the speaker/observer is facing Jean and Paul, sentence 2. would

2. Jean est à gauche de Paul

specify a spatial relationship exactly opposite to that of 1., while
if the speaker/observer was behind Jean and Paul, facing the same
direction as them, then both sentences would describe the same
spatial relationship.
133. a. The hot air balloon is further above the television tower than the helicopter is

b. The scuba diver is further below the yacht than the shark is

'under' are used when reference is to a location directly up from or down from, respectively, the reference object (cf. 'overhead', 'underfoot'), such that 134.a. describes a situation in which the hawk's potential victim could be some distance away from the tree or crag on which the hawk is perched while 134.b. requires the victim to be vertically in line with the hawk. This element of meaning is confirmed by sentences 135. and 136. and would follow from a semi-direct locational analysis.

134. a. The hawk is perched above its prey

b. The hawk is perched over its prey

135. a. Lake Louise is above sea level

b. Lake Louise is over sea level

136. a. Lake Kinneret is below sea level

b. Lake Kinneret is under sea level

since location within the spatial reflex of the top and bottom on an object would rule out objects located higher than but to the side of the reference object. ¹ We therefore suggest the following definitions:

¹ Cf. also the following:

1. Having taken off and climbed rapidly, we are now above the summit and we'll be (directly) over it in ten seconds

2. Having taken off and climbed rapidly, we are now over the summit and we'll be (directly) above it in ten seconds
for 'over' and 'under'.

137. a. 'A over B': A loc INT(SR(TP(X)))
    b. 'A under B': A loc INT(SR(BT(X)))

3.4 Indirect location and direction

3.4.1 Preliminary remarks on order and direction

In this section we will explore the relationship between indirect location and (static) direction; and it will be suggested that these two types of spatial relation are logically of the same nature, i.e. ordering relations. Expressions denoting indirect location include the pairs 'ahead'/behind', 'above'/below', 'to the left of'/'to the right of' as well as the expression 'between'. Directional expressions include 'forwards'/backwards', 'upwards'/downwards', 'towards' and the verb 'face' plus a noun phrase.

The conceptual difficulties involved in the discussion of these expressions and the spatial relations denoted by them are, primarily, (1) the implicitly or explicitly tri-adic nature of the ordering relation involved, (2) the relative nature of these spatial relations in the sense that the absolute locations of the ordered objects is not relevant, and (3) the possibility that objects can be ordered but this order need not be polarized.

If we consider the following sentences, we have an illustration of

138. John's house faces the city dump
139. John's house was built with the front towards the city dump

1 There are, of course, other locative uses of 'over' and 'under', but these involve the notion of path or some element of "from one side to the other"—cf. Bennett, 1972; Lindkvist, 1973.
140. John’s house is towards the city dump

141. John’s house is towards the city dump from the school

the different degrees of explicitness in the expression of the three objects involved in a spatial order. In 138, only one object is identified explicitly—the city dump—while the other two—the front and the back of John’s house—are implicitly referred to in the use of the verb ‘face’. In 139, only the back of the house is left implicit. Sentence 141 makes explicit all three objects involved in the ordering relation while sentence 140 leaves the third object implicit as the place of utterance. (These two sentences are adapted from Leech (1969); however, their acceptability is questionable.) The important difference between 138 and 139, on the one hand, and 140 and 141, on the other, is that in the situations described by the former set two of the ordered objects are (opposing) extremities of a single object whereas in the situations described by the latter set each object is discrete from the other.

The only spatial ordering expression which consistently makes explicit the three objects participating in the order or series is ‘between’, and this may lead us to speculate as to the possibility of a basic “betweenness” relation (cf. our use of ord in §3.4) underlying all the ordering expressions, these being differentiated by various ‘frills’ which can be added—such as specialization to a particular axis, polarization, and the suppression or incorporation of one or more of the objects within the indirect locational or the directional expression. We will return to this question shortly.

As an example of the second problem—of relativity—we may return to sentence 29, repeated here as 142. We suggested in §3.1 that the
142. John is sleeping with his head toward the mouth of the cave. The locative relation expressed by this sentence is an ordering relation: John's head is located between the mouth of the cave and the opposing extremity to his head—most likely his feet. However, we also pointed out that such an interpretation is compatible with John being either inside or outside of the cave. This is because 142, by itself tells us nothing about the direct location of John. In 143, it is even more obvious that nothing is said about John's location—he could be anywhere on earth—but something is said about his orientation, i.e., the relative positions of his front and back with respect to north. The same is true of the indirect locatives in 144 and 145, although 144. Fred is ahead of the dog 145. Mary is to the left of John the latter is less relative in that there may be a fourth object involved—the speaker—whose direct location is usually obvious from the setting of the utterance. However, the location of Mary and John will then depend upon another variable, namely, the direction the speaker is facing.

If we now turn our attention to (3), we can note that sentences 147 and 148 express equivalent spatial orders among the three flats, and this order is the same as that expressed by 149. The difference 147. John's flat is directly above Fred's and Fred's is directly above Tom's 148. Tom's flat is directly below Fred's and Fred's is directly below John's
149. Fred's flat is between John's and Tom's between 147. and 148., on the one hand, and 149., on the other, is that the latter expresses an order, but one lacking not only an axis but also a 'polarization' or 'direction' or 'sense' (or, to introduce Black's (1959) term, 'arrangement'). This unpolarized, axis-neutral order we can represent as in 150. (cf. 12., p. 48).

150. L (JOHN'S FLAT) ord L (FRED'S FLAT) ord L (TOM'S FLAT)

Sentences 147. and 148. involve a polarization (with respect to a particular axis) insofar as they express the opposite arrangement to that which is expressed by 151. and 152. Sentences 147. and 148. are equivalent, as

151. John's flat is (directly) below Fred's and Fred's is (directly) below Tom's

152. Tom's flat is (directly) above Fred's and Fred's is (directly) above John's are 151. and 152., only because the order of the arguments has been reversed. We can represent (roughly) the opposite arrangements in 147./148. and 151./152., by use of the familiar ordering symbols < and >, where the former is used when the argument to the right is 'positive' with respect to the argument to the left and the latter when the reverse is true (cf. fn. 1, p. 128). Thus, 153. corresponds to 147./148. and

153. L (JOHN'S FLAT) > L (FRED'S FLAT) > L (TOM'S FLAT)

154. to 151./152.

154. L (JOHN'S FLAT) < L (FRED'S FLAT) < L (TOM'S FLAT)

A basic problem, alluded to above and to which we will return, is whether to regard ...ord...ord... in 150. as a primitive unpolarized ordering relation or as the neutralization of polarization by the exclusive disjunction of two oppositely polarized ordering relations, i.e. the disjunction of 153. with 154. This problem connected with the analysis of 'between' we will discuss in detail in the following section. However, for now we may point out the relationship which
holds between the relative nature of a series (cf. (2)) and the possibility of the same order having different arrangements (cf. (3)). Contrary to what Black says, an order is not restricted to having only two arrangements. The order 'A between B and C' can have all the arrangements in 155 to 160, these depending upon the locations of

155. A is to the left of C and B is to the left of A
156. A is to the right of C and B is to the right of A
157. A is above C and C is above A
158. A is below C and B is below A
159. A is ahead of C and B is ahead of A
160. A is behind C and B is behind A

A, B, and C in one or other of the three axes. Granted, for each axis there will be only two possible arrangements of a given order.

3.4.2 Indirect locative expressions

The expressions 'ahead of', and 'behind' have been paired with each other by some linguists (cf. H. Clark, 1973; Gruber, 1965), this suggesting that they are opposites of some kind. However, it is not entirely clear that such a pairing is appropriate since 'ahead of' has contextual restrictions which do not hold for 'behind'. Related to this is the fact that 'behind' enters into a relation of contrast with 'in front of', as well as with 'ahead of', whereas 'ahead of' is not very comfortable as a contrasting partner to 'in back of' in those varieties of English (mainly American English) where this latter occurs along with 'behind'. That is, we have the two dialect situations depicted in Figure V.
However, both 'ahead of' and 'behind' can co-occur with 'further', indicating that they express an ordering relation—cf. 161. and 162.—while 'in front of' and 'in back of', if accepting 'further', require the context to be identical to that required for 'ahead' (see below)—cf. 163. and 164. The acceptability of 165. versus the unacceptability of 166. would also tend to indicate that 'in back of' is non-ordering, in contrast to 'behind'.

161. The Mercedes is further ahead of us than the Rover
162. The Mercedes is further behind us than the Rover
163. John is further in front of the television than Mary is
164. The carrot patch is further in back of the house than the flower garden
165. There's a police car creeping up behind us
166. There's a police car creeping up in back of us

If 'behind', when it is in contrast with 'in front of', differs from 'in back of' only in its being an expression of indirect, rather than semi-direct, location but still depends upon the extremities of the reference object—i.e. is ambiguous in the same way as is 'in back of', we can suggest the following definition for it in such contexts. Its characterization when in contrast to 'ahead of' will
167. 'A behind B': \(L(A) \text{ ord } L(B)\) \(\text{ord } L(FR(B))\)

be of similar structure, but we will postpone giving this until we have discussed 'ahead of'.

The main difference between 'ahead of' and 'in front of', other than the difference between expressing an indirect versus a semi-direct locational relation, is that 'ahead of' requires a polarized serial context such that both the object being located and the reference object are part of that series. Such contexts are exemplified most vividly in races, queues, and lists—cf. 168, to 171. In such

168. The tree is ahead of the bush.

169. The Nigerian was ahead of the New Zealander throughout the entire race.

170. John is ahead of Mary in the queue.

171. Fred's name is ahead of mine in the list.

contexts, both the object being located and the location object are comparable, each capable of changing their position in the series. The situation is somewhat different in 172, and 173, in which a journey is implicit and the object being located is on the 'path' of the journey.

172. The city loomed ahead of them.

173. The ocean is (a few miles) ahead of us.

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1 This equivalence between a three-term, unpolarized order and a two-term polarized one depends, here, upon the fact that the front and back of the reference object \(FR(Br)\) and \(BK(Br)\) define, by extrapolation, a polarized reference axis (cf. §3.3.1) such that < and > can be properly and consistently interpreted. The information to the effect that \(L(A)\) and \(L(Br)\) are on such an axis would have to accompany the two-term representation, for < and > are meaningless out of the context of a specified, polarized axis. Such representations would then resemble those of Leech—cf. §2.3, especially fn. 1 p. 31.
but incapable of moving. The reverse is not possible—cf. 174 and 175.

174. *They were ahead of the city

175. *We were (a few miles) ahead of the ocean

If we are to assimilate these cases to those of 169, to 171, then we need only require that the location object be capable of moving or changing its position in the series and that an implicit journey can provide a polarized serial context, namely, the directed path of the moving object.

We may now ask whether an observer can polarize a series in a manner similar to the way in which he can assign an extrinsic front to an object. There does appear to be such a quasi-deictic interpretation of 'ahead of', at least for some speakers. Consider someone about to choose a ball in a game of bowling. One of his observing team members utters the sentences in 176, intending by the latter one

176. Don't take that ball—it's cracked. Take the one ahead of it.

'ahead of it from your point of view'. If the player has just approached the lane from his seat, then the ball he is advised to choose is the one closer to the pins; if he has just returned from bowling one ball and is facing away from the pins—i.e. towards his observers—then it is the one closer to them. If such an interpretation is possible, then it involves the extrapolation of the polarization of the observer's front-back axis to the series in the line of his observation, such that the ball furthest from him defines the positive end of the series.

We can summarize these observations in the following way. If we
let P stand for a set of points \{p_1, \ldots, p_j\} defining either the course of a race, the path of a journey, or the locations of a series of objects in a queue, list, line, etc. such that one end point of the interval \(p_i\) is negative with respect to the other end point \(p_j\), which is positive in view of its being the finish point of the race, the destination of the journey, the head of the queue, or the first item in the list, then we can characterize 'A ahead of B' as in 177.

177. 'A ahead of B': \[ L(B_r) \text{ ord } L(A) \text{ ord } p_j \equiv L(B_r) \lhd L(A) \]

where \(p_j\) is the positive end-point of the path P and both \(L(B)\) and \(L(A)\) are in P and \(L(B_r)\) is not a constant.

In opposition to 'ahead of'—i.e. in the same contexts just outlined—'behind' can be given the following semantic characterization.

178. 'A behind B': \[ L(A) \text{ ord } L(B_r) \text{ ord } p_j \equiv L(A) \lhd L(B_r) \]

where \(p_j\) is the positive end-point of the path P and both \(L(B)\) and \(L(A)\) are in P and \(L(B_r)\) is not a constant.

Note that, if in 167, we are concerned with extrinsic backs and fronts only, then we can reduce it to 179., the second case of which is then subsumed in 178. (cf. 71, p. 96). This leaves only the extrinsic

1 In this case, the implicit polarized-axis is defined by the contextual requirement that \(L(A)\) and \(L(B)\) are both contained in an interval, P, as defined above.
179. 'A behind B': L(A) \text{ord} L(B) \text{ord} L(Y)

where Y is the observer of B and A or Y is the goal of B's movement

(by confrontation) and the intrinsic back interpretation of 167. out of the scope of 177., and these are the situations most naturally rendered by the other member of the system, 'in back of', and the situations in which 'in front of' and 'in back of' reject 'further' modification. However, there is a conflict between the confrontation use of 'behind' and its use in contrast to the possible quasi-deictic interpretation of 'ahead of' in 176. Sentence 180., under the confrontation interpretation, would be equivalent to 176. This could

180. Take the one behind it

account for the requirement of a stronger contextual polarizing factor than mere observation.

These remarks and preliminary conclusions on the semantics of 'ahead of' and 'behind' are, however, to be regarded as extremely tentative and 167., 177., 178. and 179. as but a first step towards the semantic characterization of these expressions. Much more detailed investigation is required, particularly of a dialectal kind, in order to sort out the exact position each occupies in this particular semantic system.

The expressions 'to the left of'/to the right of' and 'to X's left'/to X's right' have already been touched upon in § 3.32. Their definitions are given in 181. and 182. According to these

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1 Since the body is symmetrical along the left-right dimension and hence the axis defined by the left and right extremal portions unpolarized, 181. and 182. cannot be 'reduced' to a two-term relation as was possible in 167. However, even from the morphology of these expressions (explicitly tri-nominal) this finding could be expected. Furthermore, an alternative analysis for these expressions is possible ---cf. below.
181. a. "A to the left of B": $L(A) \text{ ord } L(IS(B_r)) \text{ ord } L(RS(B_r))$
   b. "A to the right of B": $L(A) \text{ ord } L(RS(B_r)) \text{ ord } L(IS(B_r))$

182. a. "A to B's left": $L(A) \text{ ord } L(IS_1(B_r)) \text{ ord } L(RS_1(B_r))$
   b. "A to B's right": $L(A) \text{ ord } L(RS_1(B_r)) \text{ ord } L(IS_1(B_r))$

Characterizations, sentences 183.a. and 183.b., as we would wish and

183. a. John is to Mary's left
   b. Mary is to John's right

expect, will not necessarily have equivalent semantic representations, whereas 184.a. and 184.b., under a mirror-image interpretation of

184. a. John is (to the) left of Mary
   b. Mary is (to the) right of John

IS( ) and RS( ) will. Only if we have additional information about
the situation denoted by 183. a. and 183. b. to the effect that John
and Mary are facing in the same direction, will these be equivalent.

However, there is some reason to believe that 181. and 182.,
although certainly consistent with the meanings of these expressions,
are not faithful representations of them. First of all, there is the
explicit expression of "goal" or "end point" in the form of 'to' and
possibly that of "source" or "beginning point" in the form of 'of'
(cf. the discussion of 'away from' in §3.2). This might suggest
an ordering relation something like THE LEFT ord $L(A) \text{ ord } L(B)$, which,
given that the end point is positive with respect to the beginning
point and certain other assumptions about the specification of
THE LEFT (see below), can be reduced to THE LEFT (of B) $>$ L(A).

However, THE LEFT cannot be simply the (intrinsic or extrinsic) left
side of B nor even the (intrinsic or extrinsic) spatial reflex of the
A clue to this problem is suggested by the morphological and semantic similarity of 'to the left/right of' with the compass expressions 'to the north/south/east/west of'. The expressions 'the south', 'the north', etc., denote regions implicitly or explicitly related to objects or places in the following way. (We may note the relative nature of the interpretation of 'the North' on British road-signs: at Birmingham, 'the North' refers to, say, the entire region beyond Leeds; at Edinburgh it refers to, say, the region beyond Stirling and Perth).

First of all we must grant the validity of some such notion, as the 'vicinity' of an entity as defined by Atkinson and Griffiths (1973: 41): "A vicinity is a set of points surrounding and contained within the interior and fabric of an entity. It is bounded either by a roughly spherical envelope centred on the entity or by some humanly accepted line of demarcation such as a wall or a political boundary. The extent of the vicinity of an entity seems to vary greatly depending on, amongst other factors, the proximity of the vicinities of other readily identifiable objects. Thus a native speaker may conceive an entity as being in the vicinity of Edinburgh if it is, say, within 20 miles of the city centre, but he may conceive an entity as being in the vicinity of Alice Springs if it is, say, within 200 miles of the town centre." The vicinity of an object (VIC(X)) is thus comprised of the object itself plus its total spatial reflex extended to a certain boundary. Now, looking first at the deictic situation (and perhaps supposing some such underlying correspondence as found explicitly in Old Irish (cf. fn. 1 p. 85) between
compass expressions and basic directional or indirect locational expressions), let us consider a person, A, observing the sunrise, S, as in Figure VI. That region in front of him which extends from the border of VIC(x) to S is the east. That region in back of him which extends in the opposite direction, is the west. The north and south can be similarly defined. Now, the crucial consideration is that a sentence such as 185.a. implies that of 185.b. Thus, 185.c. (in contrast to 185.e) is odd because 185.d. is odd. The situation described by 185.a. can therefore be represented as in Figure VII. Remember that THE WEST is relative to EDINBURGH and thus the 'of'

Figure VII

THE WEST

EDINBURGH

FALKIRK

VIC(EDIN)

could be interpreted as indicating the "origin" or "source" in a more abstract sense than that suggested above.
The parallelism with 'to the left/right of' should now be apparent. Again, a region THE LEFT can be defined with respect to the vicinity of an object and its (intrinsio or extrinsic) left side. 'A to the left of B' thus describes the situation depicted in Figure VIII. Again, a sentence such as 186.a. implies that of 186.b. However,

Figure VIII

![Diagram showing regions LS(B), RS(C), and VIC(B).]

186. a. Jan is standing to the left of the fireplace

b. Jan is standing in the vicinity of the fireplace

since the expressions 'to the left/right of' are generally applied to situations involving objects within the 'width' of one's perceptual field, each object is usually within the vicinity of each other; hence, it is difficult to find examples comparable to 185.c. and 185.d.

As in the case of THE EAST, THE LEFT is defined with respect to B. The representation THE LEFT (of B) > L(A) incorporates this information as well as the fact that THE LEFT (of B) is taken to be positive with respect to A; hence, the use of 'to'. Thus, the polarization along the left right axis remains arbitrary to this extent but can be correlated with which object is the reference object (positive) and which is the object being located (negative).

Although this alternative analysis is rather speculative—and we have not followed up the ramifications it may have, nor do we make reference to it in what follows—it does fit in nicely with the analysis.
of linguistic time as being comprised by the present (= the temporal vicinity of the ego) and a future and past (= the temporal regions extending in either direction from the limits of the present)—cf. 'look to the east'/ 'look to the future'.

Let us now turn our attention to the pair of expressions 'above' and 'below'. As we observed in 3.3.1, the gravitational vertical axis is absolute and constant in a way in which the horizontal axes are not. Furthermore, it is polarized in a consistent, uniform manner since the normal human being views the world from an upright position with feet on the ground. Even if, say, a person is not in canonical position, he normally uses the expressions 'above' and 'below' as if he were (or else he switches to his own intrinsic vertical axis). Thus, H. Clark (1973: 33) has proposed that "since everything above ground level is perceptible and nothing below it is, upward is naturally positive and downward is naturally negative". Because of the existence of such a constant, polarized axis, the relation \( \Rightarrow \) can be applied meaningfully to it and hence is sufficient for a representation of 'above' and 'below' in their application to gravitational vertical:

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1 These definitions, in fact, are only appropriate for 'above' and 'below' used in the sense of 'directly above' and 'directly below'. To capture the fact that they are used in a more general sense of 'at a place higher/lower than but not necessarily over/under' (cf. 134. to 136. above), we could amend the definitions by replacing \( L(B_r) \), i.e. the location of the reference object, by \( HF(L(B_r)) \), i.e. the horizontal plane containing \( L(B_r) \).
187. a. 'A above B': $L(A) > L(B_p)$  
   CONDITION: $< />$
   b. 'A below B': $L(A) < L(B_p)$  
   applied to gravitational vertical

These definitions, it will be noted, are applicable whether or not both A and B are above the ground or below it. Thus 188, receives the same

188. The pool of natural gas is above the deposit of oil

relational description as 189. That is, the vertical axis is a

189. The airplane is above the clouds

continuous one for English speakers, not being 'interrupted' by the ground. However it may be the case that perceptually it is broken down into two components—up towards the ground + up away from the ground—just as it may be broken up deictically by the use of 'come'/'go' (e.g. 'come upstairs' versus 'go downstairs').

For the representation of 'above' and 'below' as applied to the intrinsic vertical axis of the reference object, as in examples 190.

190. John has a scar above his knee

and 191., we can start with the usual three-term unpolarized linear

191. (The five of us slept in the small room.) John's head was just below my feet.

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1 In Old Irish, which, like German, consistently distinguishes between motion towards and motion away from the speaker, the vertical axis is more sharply divided into two halves since the root used to identify it changes as well as the deictic vector. Thus, English 'up(wards)' is equivalent to either 'anas', meaning "towards me from below" (cf. 'come up') or to 'suas', meaning "away from me towards above (the sky)" (cf. 'go up'). 'An-' is a prefix indicating motion towards the speaker 's' motion away while '-uas' is the root meaning "up"/"above", '-ios' that meaning "down"/"below" (cf. Hughes, 1970).
arrays

192. a. 'A above B': \( L(A) \text{ ord } L(TP_1(B_r)) \text{ ord } L(BT_1(B_r)) \)
    
b. 'A below B': \( L(A) \text{ ord } L(BT_1(B_r)) \text{ ord } L(TP_1(B_r)) \)

As with \( FR(B_r) \) and \( BK(B_r) \), \( TP_1(B_r) \) and \( BT_1(B_r) \) define an intrinsic vertical axis which, when extrapolated, also contains \( L(A) \) (cf., fn. 1 p. 128) and thus 192. can be replaced by 193.

193. a. 'A above B': \( L(A) > L(B_r) \)  
    
b. 'A below B': \( L(A) < L(B_r) \) applied to intrinsic vertical axis of \( B_r \)

Finally, we must consider the analysis of 'between'. We have already suggested that 'A between B and C' expresses an unpolarized ordering relation over the objects \( A, B, \) and \( C \). Furthermore, we have proposed that superficially dyadic expressions of indirect location can be regarded as specifying different arrangements/polarizations of such an underlying triadic order as \( \ldots \text{ord} \ldots \text{ord} \ldots \).

'Between' is often singled out as an instance of a pure triadic relation or three-place predicate—pure in the sense that it is not immediately obvious how it could be analysed into a complex of one- and/or two-place predicates. This holds true, or would seem to, specifically in the case of spatial applications of 'between'. This qualification is necessary, for it has been observed that in the temporal sphere, 'A between B and C' is logically equivalent to the

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1 But cf. Leeceh's categorical statement (1969: 69): "Three-place predicates can be readily reduced to two-place or one-place predicates through the subordination of one predication inside another, either by rank-shift or downgrading."
conjunction of two dyadic relations 'A after/later than B' and 'A before/earlier than C'—cf. 194. and 195.—whereas this is not the case in the spatial sphere—recall sentences 147./148., 149. and 151./152. And this difference has been attributed to the presence versus the absence of an intrinsic direction (or polarization) in a temporal versus a spatial order, respectively (Broad, 1938), or simply to 'before/earlier than' and 'after/later than' being expressions denoting genuinely dyadic relations involving no reference to some third term, whereas seemingly dyadic spatial expressions such as 'to the left of'/'to the right of' are incomplete relations, i.e. implicitly triadic (Black, 1959). Broad (1938: 119) puts forth the former view as follows:

In a linear spatial series there is no asymmetric dyadic relation intrinsic to the series. The only relation which does not involve a tacit reference to some term outside the series is the partly symmetrical and partly asymmetrical triadic relation of "betweenness". This is partly symmetrical because, if B is between A and C, then it is equally between C and A; and conversely. It is partly asymmetrical because, if B is between A and C, C cannot be between A and B and A cannot be between B and C. In the temporal series of experiences which constitutes a person's mental history there is a genuine dyadic relation which is intrinsic to the series and involves no reference to any term outside the latter. This is the relation "earlier than". It is the fundamental relation here, and temporal betweenness is definable in terms of it. In the temporal series there are two intrinsically opposite directions, earlier-to-later and later-to-earlier. In the linear spatial series there is no intrinsic direction. If direction is to be introduced, this must be done extrinsically, either by reference to motion along the line (and therefore to time), or by reference to the right and left hands of an external observer, or in some other way.

The view of 'to the left of'/'to the right of' as incomplete relations is explicated in a somewhat similar way by Black (1959: 58-9, 63):
We might say that the relation being to the left of only seems to be a genuine two-termed relation, because its full expression would require reference to at least one other object besides those that seem to be related. The question "Is A to the left of B?" must be amplified to read "Is A to the left of B when viewed from the standpoint of C?" ... I propose to say that the relation being to the left of is an "incomplete relation".

The chief point I now want to make is this: If you want to identify the arrangement of a given spatial series of objects, you must use an incomplete relation. There is no conceivable way in which you could know that A, B, and C stood in the arrangement with A on the extreme left (rather than with A on the extreme right) except by reference to your own body, or some other body different from A, B, and C.

... And similarly it seems to be part of our use of temporal words that the relation being earlier than is not an incomplete relation. If anybody uses such a phrase as "earlier than B from the standpoint of so-and-so" we are entitled to conclude that the speaker is using the temporal expressions in some unusual and bizarre sense.

Broad and Black each recognize 'between' as both triadic and undirected or unpolarized. However, whether they are correct in assuming the genuinely dyadic nature of the temporal ordering relations is something we may wish to question and we will return to it in our discussion of the extension of the spatial semantic system to the domain of temporal location and relations.

In the preceding analyses of indirect locatives, we too have treated such expressions as implicitly triadic, i.e., as specifying an order over three objects, even if two of these 'objects' are but opposing extremities of the reference object. However, this is a somewhat different interpretation of the triadicity of, for example, 'to the left of', than that of Broad and Black. For them, the third argument of this expression, or the relation denoted by it, is the observer whereas in our analyses, the implicit third object in the ordered array is the right side of the reference object (recall:
"A to the left of B": $\text{L}(A) \text{ or L}(\text{LS}(B_r)) \text{ or L}(\text{RS}(B_r)))$. The observer himself does not enter into the ordered array; rather, his function is to assign subjective (mirror-image) left and right sides to the reference object, such that an order is definable (this requiring a minimum of three objects).

Looking further at the possibility that 'between' expresses a triadic, inherently unpolarized relation, we may consider Russell's (1919: 39-49) demonstration of how, starting with a primitive triadic relation with certain formal logical properties—a "between" relation—one can generate a series (an order plus an arrangement of it) of the type "to the left of". He begins with a linear array of points ordered with respect to the "between"-relation and then from the assignment of "to the left of" to one pair of points, $a$ and $b$, defines 'x is to the left of $y$', generally, for any two points on the line. Unfortunately, the crucial step as far as we are concerned—that whereby a polarization is assigned to the linear array of objects—is given no amplification whatsoever by Russell: "For the sake of definiteness, let us assume that $a$ is to the left of $b$" (1919: 40). However, we could make explicit what Russell here has glossed over. For example, the following rules would be sufficient: (1) choose two points in the

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These are (1) if anything is between $a$ and $b$, $a$ and $b$ are not identical, (2) anything between $a$ and $b$ is also between $b$ and $a$, (3) anything between $a$ and $b$ is not identical with $a$ (nor, consequently, with $b$, in virtue of (2)), (4) if $x$ is between $a$ and $b$, anything between $a$ and $x$ is also between $a$ and $b$, (5) if $x$ is between $a$ and $b$, and $b$ is between $x$ and $y$, then $b$ is between $a$ and $y$, (6) if $x$ and $y$ are between $a$ and $b$, then either $x$ and $y$ are identical, or $x$ is between $a$ and $y$, or $x$ is between $a$ and $y$, or $x$ is between $a$ and $y$ (Russell, 1919: 39).
series, (2) look at them and assign to them left and right sides according to the mirror-image convention, and (3) that point whose right side, so defined, is between its own left side and the left side of the other point can be said to be to the left of the other point. Note the need to talk about 'the one' and 'the other'.

Russell's approach, so supplemented, is one which takes "betweenness" to be primitive and inherently unpolarized. This is the approach which we have adopted in our use of ...ord...ord... Let us now look at the other alternative, where the neutrality of 'between' especially in such contexts as 149. above, is analyzed as the result of some kind of exclusive disjunction of two oppositely arranged orders. The choice between these two alternatives is, of course, very much akin to the debate about symmetrical predicates and reciprocal constructions (cf. Gleitman, 1969; Lakoff & Peters, 1969; Anderson, 1973d; cf. also §4.2). Are such predicates as 'similar', 'match', 'meet', etc., inherently intransitive, such that their symmetricity requires that they originate with conjoined subjects, either conjunct of which can be transposed to give a transitive structure; or are the structures with conjoined subjects symmetric only as a result of their being a conjunction of two transitive structures contrasting in the order of the two arguments? We have already suggested that a quantified version of the latter view is the more attractive alternative (cf. our discussion of 'in front of each other' in §3.3.2). The main respect in which the analysis of 'between' would differ would be in its derivation from an (exclusive) disjunction rather than from a conjunction.

Our first question should be whether there are any paraphrases.
of 'between' which are neutral as to the dimension in which the objects to be ordered are located (i.e. as to whether it is the vertical axis or one of the horizontal axes which is involved) and which makes explicit the disjunctive nature. Possible candidates are given in 196.

196. a. 'A between B and C' ≡ 'B and C on opposite sides of A'
   i. The post office is between the library and the police station
   ii. The library and the police station are on opposite sides of the post office

b. 'A between B and C' ≡ 'B and C to/on either side of A'
   i. John is between Fred and Tom
   ii. Fred and Tom are to/on either side of John

c. 'A between B and C' ≡ 'B on one side of A and C on the other'
   i. The house is between two elm trees
   ii. There is an elm tree to/on one side of the house and an elk tree to/on the other

d. 'A between B and C' ≡ 'A in one direction from B and in the opposite direction from C'
   i. Regina is between Calgary and Winnipeg
   ii. Regina is in one direction from Calgary and in the opposite direction from Winnipeg

Only in d. is the thematic structure of 'between' maintained: A remains the object being located and B and C the reference objects.

The problem, of course, resides in specifying the meaning of 'one side'/ 'the other side', 'opposite sides', 'either side', 'one direction'/ 'the opposite direction'. Obviously there is no priority
of polarization here with respect to one side or the other (as distinct from the opposition 'this side'/the other side') but rather the separate and exclusive consideration of each of two possible (and opposing) sides of A or two possible (and opposing) directions towards A with respect to one of B and C and such that both B and C are considered. That is, we have a non-specific one-to-one mapping between two two-member sets.

How to represent such a mapping has not been investigated in the present study, but it would presumably involve partitive structures based on (two-member) sets such that 'one side of A' would be something like "one from the (two-member) set X of sides of A" and 'the other side of A' something like "the one from the set X such that one" (cf. Anderson, 1974: 38: "Subset of the X not including Y (included in X) reduces quite generally to others"). "Side" and "direction" would furthermore be restricted to extremal portions or vectors in one dimension—i.e. to opposing sides and directions—but this could be included in the definition of X as a two-member set. As such structures as these, whatever their precise form, will be needed in any case—not only to account for the derivation of the paraphrases of 'between' in 196., but also in the semantic description of such complex locative expressions as 'through', 'across', and 'along'—an analysis of 'between' in terms of some type of exclusive disjunction (or quantified version thereof), as in the paraphrases of 196., would
not require any additional apparatus. 1

We are not able to settle this question here. Whatever form the final analysis of 'between' takes, however, it must be such that the paraphrase relations are accounted for, as well as the implicational relation between any of 155. to 160. and 'A between B and C'. This latter relation also holds between the more complex directionals which we will not look at until later, but which are illustrated in 197. Furthermore, we would expect the semantic analysis of

197. a. The base camp is [across the river] from the trenches
   b. The [river] is between the base camp and the trenches

198. a. and 199. a. to be related to that of 198. b. and 199. b., the latter being implied by the former.

198. a. The Sinai separates Israel and Egypt
   b. The Sinai lies between Israel and Egypt

199. a. The Channel Tunnel will connect England and France
   b. The Channel Tunnel will run between England and France

1 There is a further possibility for a polarity-neutralized analysis of 'between'. This is one which is in terms of semi-direct rather than direct location but which also trades on some notion of opposing sides of different objects: 'A between B and C' under such an analysis would mean "A is in the intersection of the spatial reflex of the side of B which opposes/faces C and the spatial reflex of the side of C which opposes/faces B". However, if 'face' (or 'oppose') involves, as we suggest in the following section, an ordering relation ("the side closer to"), then the difference between these two alternatives may be very little. It is nevertheless the case that an eventual analysis of 'between' must also accommodate implicational relationships involving semi-direct expressions—cf. 1. and 2.

1. The elm tree is the one in front of the oak tree and behind the birch
   The elm tree is the one between the oak tree and the birch

2. Fred is standing to the left of the door and to the right of the fireplace
   Fred is standing between the door and the fireplace
3.4.3 Static directionals

'Towards', like 'between' is neutral with respect to which axis it is applied to. Furthermore, in its most natural static uses, it expresses the orientation of a body with respect to a reference object by means of ordering the latter and two opposing extremities of the body, one of which is explicit and occupies the place of the object to be located. In this respect, 'towards' is similar to the indirect locative expressions 'to X's left'/ 'to X's right', in which case it is the reference object (an extremity) and the opposing extremity which are put into an order with the object being located. Thus, for example, 200.a. and 201.a. are semantically very similar, as 200.b. and 201.b. reveal. (Whereas for the other indirect

200. a. John has his left side towards Mary
   b. \( L(RS_1(JOHN)) \) ord \( L(LS_1(JOHN)) \) ord \( L(MARY_1) \)

201. a. Mary is to John's left
   b. \( L(RS_1(JOHN)) \) ord \( L(LS_1(JOHN)) \) ord \( L(MARY_1) \)

locatives and the axis-dependent directionals we were able to give a non-arbitrary interpretation of \( < \) and \( > \) in terms of the intrinsic polarity of the axes or the context, in the case of 'towards', which is axis-independent, and 'left'/ 'right', which depend upon a symmetrical, non-polarized axis, the polarity is determined by which object is the reference object, this being considered positive.)

If we let \( \alpha AX(A) \) and \( \alpha AX(A) \) stand for opposing extremal portions of an object, A, then we have, as a general characterization for 'an extremity of A towards B', where A is the object being oriented, the following:

202. \( L(\alpha AX(A)) \) ord \( L(\alpha AX(A)) \) ord \( L(B_1) \)
Expressions such as 'oceanwards', 'winwards', 'northwards', 'skywards', etc. can then be analyzed as the joint realization of what is normally realized as 'towards' and the reference object.\(^1\) Compare 203. and 204. The verb 'faces', in one usage, as in 205.

203. Our house was built with the front towards the ocean
204. Our house was built with the front oceanwards
205. Our house was built facing the ocean

(synonymous with 203./204.), represents the joint or portmanteau realization of all of 202. (with \(EX(A) = FR(A)\)) apart from the third term (the reference object). In other cases, 'towards' (or 'ward') is realized separately, as in 206. Finally, if one of the

206. Our house faces \{towards the ocean
\{oceanwards

extremities is explicitly mentioned—as the subject of 'face'—then this need not be the front, and 'face' is then virtually synonymous with 'towards': 'an extremity of A faces B' and 'an extremity of A towards B' will have the same representation (202.)—cf. 207.

207. Our house was built with the \{back
\{front
\{windowless side
\{facing
\{towards

the ocean

The verb 'point' is similar to these last two uses of 'face', the main difference being that 'point' requires, or strongly prefers,

\(^1\) Similarly, 'inwards'/'outwards' are "towards a place inside/outside (of)" and 'forwards'/'backwards' "towards a place in front/in back (of)". 'Upwards'/'downwards' are not quite so transparent.
the opposing extremities of the object to be ends, rather than sides—
cf. 208 to 210.

208. a. The rifle was at the door, pointing upwards
   b. ?The rifle was at the door, facing upwards

209. a. The back end of the car pointed downhill
   b. ?The left side of the car pointed downhill

210. a. John pointed his finger {at me
   (towards the mess to be cleaned up

The distinction between ends and sides of objects has to do with which
dimensions of an object are referred to as 'length' and 'width'—cf.—
Teller, 1967: 214. 'Aim' appears to involve the same semantic rel-
ation as 'point' but is restricted to objects capable of propelling
something or being propelled themselves in the direction in which they
are pointing—cf. 211 and 212.

211. a. John's finger is pointed at me
   b. ?John's finger is aimed at me

212. a. The missiles were pointed towards Tel Aviv
   b. The missiles were aimed towards Tel Aviv

One might ask if there is a directional expression in opposition
to 'towards', one which realizes 213. The nearest one gets to this is
'an extremity of A away from B', as in 214., which on first glance

213. L(\neg\text{EX}(A)) \text{ or } L(-\text{EX}(A)) \text{ or } L(B_r)

214. John was sleeping with his feet away from the mouth of the
cave

appears to paraphrase 215. However, although 214, can be modified

215. John was sleeping with his head towards the mouth of the
cave
as in 216., 215. cannot. This suggests that what is involved in

216. John was sleeping with his feet two yards away from the
mouth of the cave

217. John was sleeping with his feet two yards towards the
mouth of the cave

215. is the "at some distance from" interpretation of 'away from'
(cf. 3.2). Furthermore, such expressions as 'point something away
from' do not necessarily imply the opposite orientation to 'point
something towards'—cf. 218.

218. Point your gun away from the people over there

This basic gap in the expression of direction is carried over to
dynamic context, as we shall see. There is simply no way of express-
ing movement directed away from some place without implying that the
movement originated, or passed through, that place. This is in
contrast to 'towards' which implies no attainment of the location of
the reference object.  

1 One may want to argue that 'towards' and compounds of 'ward' do not
realize simple directional or ordering relations but rather imply a
deleted verb 'turn' which is primarily motional and which is used in
a derivative static sense parallel to the static uses of 'run',
'lead', 'go', etc. with nouns denoting paths—cf. 1. to 4.

1. John went to London
2. The A9 goes to Inverness
3. John turned the corner
4. John's head is turned toward the window

However, the semantics of 'turn' in its concrete applications is not
at all clear—less so than in its abstract use (5.) as an inceptive
predicator (cf. Gruber, 1965). Furthermore, the use of 'be turned',

5. The milk turned sour

'be directed', 'be oriented', as in 6., is, we suggest, more akin to
the use of 'be located', or 'be situated', in 7.

6. The front of the house is \textit{[turned directed oriented]} towards the ocean

7. The ball is \textit{[situated located]} in the box
3.5 Conclusion

There are, of course, many pure locational and static directional expressions which we have not mentioned and many we have been unable to discuss in much detail. However, we hope to have covered adequately the central ones, particularly those which will be needed in later chapters.

In general, we have not considered locative and directional verbs (other than 'face', 'point', and 'aim'). Among these are the verbs of posture, such as 'lie', 'stand', and 'sit', which not only behave like the copula in taking locative complements but also encode orientational properties of the object being located (cf. 'face' and 'point'). The reader is referred to Teller (1969) for an analysis of these verbs. More complex verbs of this type are the directional ones such as 'hang', 'suspend', and 'protrude'. Other verbs are alternate realizations of some of the locative relations which we have already discussed, or at least incorporate them (cf. Gruber, 1965). Thus, 'contain', 'include', and 'encompass' encode the same spatial relation as 'in' (through differing in thematic structure) while 'underlie' and 'overhang' involve, in part, the same semantic structures as 'under' and 'over', respectively. However, the realization of spatial relations by or within verbs is a much more striking and pervasive property of the vocabulary of motion, and Gruber's work here is particularly insightful.

Finally, we have left to the side in this chapter those spatial expressions which invariably require some reference to the notion of a journey (or path). (We have also avoided discussing those interpretations of essentially locative expressions which likewise depend
upon some contextually implicit or explicit reference to such notions.)

These fall into two groups: one, the couple 'from' and 'to', the other,
the set of expressions 'via', 'across', 'through', 'along', etc.

'From' and 'to' have been described as the realization of under-
lying "source". and "goal" or "ablative" and "allative" cases by
Bennett (1972) and Anderson (1971b), respectively. The second set
realize a primitive "path" case for Bennett (1972) and a complex
"ablative"/"allative" case for Anderson (1971b). Gruber (1965) hints
at this latter interpretation as well. However, such characterizations
lack explanatory power since "source", "path", and "goal" are all mean-
ingless outside the framework of a "journey" (or an "extent") of which
they are a part. That is, as a top must be the top of something and
a mother the mother of someone, source, path, and goal are relational
elements—the source of a journey, for example, being the place at
which the journey begins—and they can receive explicit character-
izations only within the context of an explicit characterization of
what constitutes a journey. Our approach will therefore be more sim-
ilar to that of Leech's than to Bennett's. However, our character-
ization of a journey will diverge from Leech's in that we consider this
to be more than just the conjunction of the inception of the positive
destination (=goal) and the inception of the negative destination
(=source) (cf. Leech, 1969: §8.7.2; Gruber, 1965). Such an account
ignores both the temporal dimension of a journey and the role of a
dynamic, directional component—going to a place involves going towards
the place. Such factors must be included if one is to account in a
plausible way for the range and interpretation of temporal and aspect-
ual modification of sentences denoting journeys as well for the
differences and similarities between various kinds of journeys—such as, for example, between those which are more or less a conjunction of a "source" and "goal" ('enter a room', 'cross a line') and those which require some 'middle' component ('go through the room', 'cross a river'). As all these considerations will have significance in spheres other than the purely concrete, it will be useful at this juncture to make a brief excursus into the background and principles of the localist hypothesis. This will occupy our attention in Chapter 4.
IV
THE LOCALIST HYPOTHESIS

4.1 Historical background

The thesis of localism, or the localist hypothesis, would appear to have its origins—at least as far as the linguistic tradition is concerned—in the attempts by Classical scholars to explicate the grammatical category of case as exemplified in Greek and Latin. From antiquity onwards the development of a coherent theory of case occupied a central position in linguistic discussion, and this for several interrelated reasons. Foremost among these was the inescapable importance of case in the linguistic systems of these languages—"les cas dominent d'une façon impressionnante, et plus que n'importe quelle autre catégorie flexionnelle, toutes les manifestations du mécanisme linguistique, syntagmatiques aussi bien que paradigmatiques" (Hjelmslev, 1935: 1). Furthermore, in contrast to the other inflexional categories such as number, gender, tense, a notional characterization of case was fraught with immense difficulties, it being impossible to relate the varied and variable significations of the case forms to any single, general semantic (or Aristotelian) category (cf. Lyons, 1968a: 174). The fact that individual case forms appeared to have variable significations or uses, usually

1 Cf. Hjelmslev (1935: 3): "Pour bien poser le problème de la signification des cas, il faut chercher une définition qui permette de délimiter rigoureusement la catégorie sans violer les faits, et déterminer, en s'appuyant sur la totalité des faits empiriques, l'espace de signification propre à la catégorie prise dans son ensemble, pour démontrer ensuite comment les cas particuliers se répartissent sur l'échelle significative."
ranging from concrete or local ones to more abstract or grammatical ones, was taken to necessitate searching for the 'Grundbedeutung' of each case. As the conception of grammar developed at the time was generally one which did not allow for much more than a one-to-one correspondence between semantic values and morphological categories, such attempts most often met with failure, particularly with such 'superficial' cases as the nominative.

However, among the many approaches to constructing a theory of case—initially for Greek—there was one which was rather more successful than most in giving a unifying semantic characterization of the case forms and in constructing a coherent theory of case meaning. This was the theory put forward by the Byzantine grammarian Maxims Planudes in the 13th-14th centuries (cf. Hjelmslev, 1935; Robins, 1972; Anderson, 1973a).

His was apparently the first attempt at defining the cases in terms of directional opposition: the genitive was the case of 'éloignement', the accusative the case of 'rapprochement', and the dative the neutral case indicating 'repos'. Such a localist theory of case recognized as equivalent the concrete or local manifestations of the principle of direction and its

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1 For discussion on the relevance to case theory of recognizing a more abstract level of grammatical description and the possibility of complex mappings between 'deep cases' or case relations and 'surface cases' or case forms, cf. Fillmore, 1968; Lyons, 1968a: § 7.2.; Anderson, 1971b.
abstract or grammatical manifestations (cf. Hjelmslev, 1935: 13). However, the theory espoused by Planudes did not establish a tradition and, although there were scattered and fragmentary localistic proposals with regard to the case system of Latin in the Middle Ages, it was not until the 19th century that localism became a controversial hypothesis and engendered a lively, but unfortunately short-lived, debate. Before and during this time, progress was made in widening the understanding of case systems in general. For instance, Bernhardi (cf. Hjelmslev, 1935: 24) pointed out a significant overlap in the significations of the various cases and the prepositions. Later on, word order was also recognized, most forcibly by Wundt, as another means of expressing the same kinds of grammatical relations. Furthermore, it was argued that the conceptual category common to prepositions and cases alike was not the classical opposition of dependence versus independence with respect to the verb, but rather that of a relation holding between two objects.

1 Robins (1972: 49) gives a stronger interpretation to Planudes' system: "It is assumed that all the other, non-spatial, meanings of the oblique forms are derivable by metaphorical transfer from one or other of these basic distinctions of approaching, static position, and separation." He also presents further evidence, of a semantic nature, supporting a localist analysis such as Planudes'. This is based on the meanings of prepositions with dependent cases: "In particular, in three prepositions used before all three oblique cases one can isolate a specific prepositional component with either "from", "at", or "to", according to the case governed" (p. 49.) The spatial metaphor involved in the origin of the term "transitive verb" (rhema metabatikon) is also seen to be compatible with the localist theory: "...the action or process designated "passes over" to the goal or object, represented by NP in the accusative case" (p. 49; cf. also Lyons 1968a: § 8.7.2.).
It was Wdillner, following and elaborating upon Bopp, who once more proposed a localist theory of case, this time for Latin and German (Wdillner, 1827). His analysis was essentially identical to that of Plamides', but he made explicit the necessity of establishing a Grundbedeutung for each linguistic form—ones abstract enough to permit the deduction of all the manifested uses of the form—and also introduced a subjective element into the interpretation of the signification of linguistic forms. Thus, the subjective phenomenon expressed by the category of case (and prepositions) was a spatial concept: "cette conception est appliquée par le sujet parlant aux divers ordres du phénomène objectif, qu'il s'agisse de l'espace, du temps, de la causalité logique ou de la rection syntaxmatique.... Selon Wdillner il n'y a là rien de surprenant: toute opération intellectuelle repose en dernière analyse sur les conceptions de l'espace et du temps. L'opération intellectuelle consiste à ramener à des formules spatiales et temporelles les faits observés dans le monde objectif" (Hjelmslev, 1935: 37). Here, Hjelmslev suggests a definite influence of the philosophy of Kant. According to Kant, space and time were not things perceived, but modes of perception, the means by which sense data are selected and organized. Because all ordered experience was held to involve and presuppose them, space and time were a priori.

Such a localist theory attracted opposition, and various explicitly anti-localist systems were put forward, such as the causal theory of Michelsen and the more familiar syntactic theory of Rumpel, whereby the nominative, accusative, and dative cases were explicated in terms of the notions subject, object, and indirect object,
respectively (cf. Hjelmslev, 1935, for discussion and criticism). However, these theories were later enlarged in order to handle the other cases and included the recognition of both grammatical cases and local cases, but this latter with an "interpretation materialiste et massive avec laquelle la théorie localiste ne présente aucune analogie" (Hjelmslev, 1935: 57). This theoretical standpoint was called 'demi-localiste' by Hjelmslev: it marked a return to the idea of 'une conception spatiale'; but, having grown out of opposition to the localist theories, it accorded the directional dimension a much more concrete interpretation—one not equally applicable to the more abstract or logical functions of the 'grammatical' cases.

Interest in this controversy waned in the early 20th century. Again, this would appear to be due to the general difficulties—vagueness and circularity—inherent in an approach to grammatical description which sought direct and unitary semantic characterizations of basically superficial phenomena. These difficulties led to localist theories being labelled as discredited by some and ignored by most 20th century linguists (cf. Jespersen, 1924: 186; Fillmore, 1968: 9). It was not until 1935, when Hjelmslev published the first part of his La catégorie des cas, that localist proposals were revived. Here he argued both for a 'panchronic' theory of case as well as one based on localist notions. He drew upon the intervening study by Rask on the Finnish case system which lent itself

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1 For a recent treatment of case systems as one-step mappings between case relations and case forms see Starosta, 1973.
quite transparently to a localist analysis: the dimension constituted by 'rapprochement'-'repos'-'éloignement' manifests itself on four different planes, yielding twelve distinct cases. To this primary dimension of direction, Hjelmslev added two others—that of 'cohérence'-'incohérence' (cf. § 3.2) and that of 'subjectivité'-'objectivité' (cf. § 3.3.1).

It must be noted that Hjelmslev was still concerned with uncovering a 'signification fondamentale' for each case: "un cas, comme une forme linguistique en général, ne signifie pas plusieurs choses différentes; il porte une seule notion abstraite dont on peut déduire les emplois concrets" (Hjelmslev, 1935: 85). However, the Grundbedeutung of a case form was now conceived of in systemic terms (i.e. the case system of a language was to be accounted for in terms of a small number of oppositions), and Hjelmslev used his three distinctive oppositions to this end. Furthermore, he explicitly recognized the overlap in the semantic functions of case forms, prepositions, and word order—as would be necessary for any panchronic theory of case. But this insight he did not use to any particular advantage: interlinguistically, in all the languages he analyzed, his attention was restricted to the elaboration of case systems for inflectional case forms only; and, intralinguistically, he failed to explore the possibility of postulating a perhaps more indirect and more complex correspondence between the semantic case relations and their realization by various means within the language.

It was not until the introduction into general linguistic theory of the hypothesis of a more abstract or 'deeper' level of syntactic-semantic description with a set of rules or principles relating this
level to that of superficial linguistic forms that progress became possible, both in the general area of case grammar and in the localist conception thereof. With respect to this latter, Anderson (1971b: 10-11) argues that "a more abstract view of case—taking this term to refer to grammatical relations contracted by nouns which express the nature of their 'participation' in the 'process' or 'state' represented in the sentence...and which are represented superficially in various fashions, including inflectionally and by pre- and post-positions—enables us to avoid some at least of the difficulties encountered by earlier studies, and yet to maintain an essentially localist standpoint." Thus, the re-statement or re-interpretation of the localist hypothesis is one in terms of underlying or semantic cases or case relations: "there is evidence that underlying grammatical functions are in general organized basically in terms of oppositions involving location and direction. Semantic representations are constructed out of predications that are locational or directional or non-locative non-directional, and in particular many 'abstract' functions involve location or direction. That is, functions like 'agentive' or 'dative', as well as 'ablative' and 'locative', can be characterized semantically with respect to such notions: spatial location and direction represent only the most concrete manifestation of such" (Anderson, 1973a: 10-11).

4.2 Syntactic and semantic arguments in support of the localist hypothesis

Before this recent development in case theory, discussion tended to concentrate on the different semantic functions—concrete or abstract—of each of the various cases. However, this is only one
side of the coin. For these semantic functions of one and the same case form are not, in general, in contrast (which is not to say that the case forms may not themselves contrast—cf. Lyons, 1968a: §7.4.7). That is, they are contextually determined, most notably by the semantic properties of the noun dependent upon the case form and of the governing verb (and its other dependent noun phrases).

The semantic properties of the noun phrase governed by the case form is usually criterial in differentiating, within the local functions, those of space and those of time (cf. Lyons, 1968a: 300; Anderson, 1972: §12; J. Geis, 1970; and §7.4) although there are contexts in which both sub-types of the local function are appropriate. This latter situation obtains when the noun is a second-order nominal describing an event, since these are associated with both a spatial and a temporal location. Thus, the sentences below can answer either a 'where' or a 'when' question:

1. a. John fell asleep at the lecture
   b. The president presented his proposals at the meeting
   c. Fred got drunk at the party
   d. Mary had her purse stolen at the concert

   However, as would be expected if the locative is a complement (and the subject a first-order nominal) rather than an adjunct (cf. Lyons, 1968a: §8.1.10), there is only the spatial interpretation available, it being impossible to predicate directly a temporal location of a first-order nominal. The sentences below, without the bracketed phrase, can answer only 'where' questions; and they can take the bracketed temporal adjunct only if the complement is there and is interpreted spatially:

1. a. John was at the lecture
   b. The president was at the meeting
   c. Fred was at the party
   d. Mary was at the concert
   } (between eight and nine o'clock)
It should perhaps be pointed out that whereas in such pairs of expressions as 'at the house'/ 'at noon', 'in the house'/ 'in the afternoon', 'from London to Edinburgh'/'from morning to night', 'between here and there'/'between now and then' the prepositions may be considered neutral with respect to the distinction of space versus time, this being marked instead by the inherent properties of the dependent noun phrase, in the case of inherently temporal prepositions or postpositions co-occurrence with a spatial rather than a temporal noun phrase will increase the complexity of the semantic interpretation of the phrase (and of the sentence as a whole since movement must be involved) but does not change its function from temporal modification to spatial. The sentences below answer 'when' questions only:

2. a. John has been reading the newspaper \(\{\text{since } 1:00 \text{ hours}\) during the past three hours

   b. John first noticed the smoke about an hour ago

3. a. John has been reading the newspaper \(\{\text{since Manchester during the past thirty miles}\)

   b. John first noticed the smoke about fifty miles ago

   (cf. about fifty miles back)

On the other hand, it is the governing verb and other dependent noun phrases which generally distinguish the local functions from the more abstract or grammatical ones; but this, it should be emphasized is a matter of degree—witness the gradual increase in abstractness of the directional relation expressed in the following sentences

(matched by a corresponding increase in the abstractness with which
'poem' is comprehended):\(^1\)

4. a. Terry handed the poem to Sue
   b. Terry brought the poem to Sue
   c. Terry gave/sold the poem to Sue
   d. Terry dedicated the poem to Sue
   e. Terry read/recited the poem to Sue
   f. Terry taught the poem to Sue

Thus, anticipating somewhat, a localist theory of case leads directly to a localist classification of verbs or predications (or, more precisely, of proposition types)—one with both syntactic and semantic motivation—according to what kind of locative and/or directional situation is being expressed. In this light, the sentences in 4. all describe journeys (movements from one place to another) of various degrees of abstractness, as do the corresponding ones in 5.

5. a. Sue grabbed the poem from Terry
    b. Sue took/bought the poem from Terry
    c. Sue heard the poem from Terry
    d. Sue learnt the poem from Terry

However, in 5., the goal (allative) rather than the source (ablative) is subjectivized (cf. Anderson, 1971b; Fillmore, 1968; Starosta, 1973), this being accompanied by a change in agency. Nevertheless,

\(^1\) It is likely that there are, as well, different kinds of abstraction relevant to a full analysis of these examples.
the directional relationships remain unaltered.

Similarly, though not as transparently, the sentences in 6. express some of the corresponding locational relationships:

6. a. i. The poem is in Sue's hands

   ii. Sue has the poem (in her hands)

b. i. The poem is in Sue's possession

   ii. Sue has the poem (in her possession)

   iii. Sue possesses the letter

   iv. Sue owns the poem

   v. The poem belongs to Sue

c. Sue knows the poem

Various pieces of syntactic evidence to support a locative analysis of have and possessive expressions in general have been adduced from English, and more clearly from other languages—see in particular Lyons, 1967, 1968a, 1968b; also Anderson, 1971b, Brauner, 1972. Lyons (1968b: 500) suggests that "the distinction between locatives and possessives, in languages like English in which there is a distinction, is a secondary surface-structure distinction based, largely, on the distinction between animate and inanimate nouns. John has a book is the surface-structure 'realization' of what might be represented as A book (be) at-John." Anderson (1971b: § 7.22.) syntactically motivates a locative analysis for affective verbs such as 'know', 'understand', 'need', 'hate', 'love', etc., the subjectivized locative analysis of possessives providing the paradigm for these more abstract manifestations of a locational relationship (cf. too Miller, 1974, for locative and directional analyses of the corresponding verbs in Russian, and Velten, 1931, for diachronic
Such syntactic classifications are supported and more strikingly illustrated by the observation of a deep semantic parallelism between triples expressing 'movement to'- 'location at'- 'movement away from' at all levels of abstraction, causative and non- causative:

7. a. i. The parcel went to London/John took the parcel to London
   ii. The parcel was in London
   iii. The parcel left London/John dispatched the parcel from London

b. i. Mary acquired the book/John gave the book to Mary
   ii. Mary had the book
   iii. Mary lost the book/John stole the book from Mary

c. i. Mary learnt the poem/John taught the poem to Mary
   ii. Mary knew the poem
   iii. Mary forgot the poem

The distinguishing semantic properties of these triples are the implicational relations which hold, on the one hand, between the present (or past) perfect of the i. sentences and the simple present (or past) form of the ii. sentences, and on the other, between the present (or past) perfect of the iii. sentences and the simple present (or past) negative form of the b. sentences (cf. Lyons, 1968a: 397-8; Leech 1970: 157; Anderson, 1974b: 120):

8. a. i. The parcel has gone to London $\Rightarrow$ The parcel is in London
   ii. The parcel has left London $\Rightarrow$ The parcel is not in London
b. i. Mary has acquired the book ⇒ Mary has the book
ii. Mary has lost the book ⇒ Mary does not have the book
c. i. Mary has learnt the poem ⇒ Mary knows the poem
ii. Mary has forgotten the poem ⇒ Mary does not know the poem

Lyons (1968a, b) characterizes the difference between the ii. sentences, on the one hand, and the i. and iii. sentences, on the other, as an aspectual one of static (unmarked) versus dynamic, with the locative/directional distinction being but one manifestation of this superordinate opposition. Further, he claims that this is "correctly regarded as an opposition of aspect" on the basis of the relationship of consequence holding between the sentences in 8. above. However, even if, in fact, the perfect form does encode an aspectual element, this does not ensure that the locative/directional distinction involved in the implications above is explicable in terms of aspect alone. What we will argue—in keeping with the thesis of localism—is that the distinction in all instances (7.a. to 7.c.) is one of locative versus directional, that of 7.a./8.a. being the more concrete (spatial) manifestation of the distinction. Furthermore, the static/dynamic distinction would appear to be independent of the locative/directional one, both because of the existence of static directionals (as pointed out by Anderson (1971b: 124))—cf. 9.—and because the

9. a. The road goes from Tarbert to Stornaway
b. The carpet stretches across the room

difference between the i. and iii. sentences of each set in 7. involves an opposition dependent upon the selection of 'directional', namely
that of opposing direction. That is, if the distinction is regarded as static versus dynamic, we must still invoke some notion of direction (or order) upon which to define contrasting directions. However, if the distinction is regarded as one of locative versus directional, the contrast between i. and iii. sentences can be accounted for directly by a contrast in the polarity assigned to 'directional'.

Anderson (1973d) has observed that another class of predicates falls into two subclasses which also have distinctive syntactic properties relatable to those of directional sentences; and both classes have semantically to do with 'opposing direction' (either convergence or divergence). These are the predicates syntactically characterized by the fact that they can occur either transitively or intransitively, but if the latter, then (1) their subject must be non-singular (either categorially, lexically, or as a result of noun phrase conjunction) and (2) they may be followed by a reciprocal phrase (cf. the so-called 'symmetric predicates' of Lakoff and Peters, 1969).

There are, on the one hand, the topological (spatial) predicates such as 'join', 'meet', 'converge', 'be close'/adjacent' and their institutionalized or otherwise abstract counterparts such as 'marry', 'join in wedlock', 'correspond', 'resemble', 'be similar', all of which occur with a superficial allative (a 'to'-phrase), unless it is objectivized, and semantically involve direction toward the referent of the noun phrase governed by the allative. On the other hand, the topological predicates such as 'separate', 'diverge', 'part', 'fork', 'branch', 'be far'/distant', and their abstract counterparts 'divorce', 'separate', 'differ', 'be different' all occur with an ablative
('from'-phrase) and involve directedness away from the referent of the governed noun phrase. Anderson (1973d: 8-9) remarks, with regard to the former set, that "it is clear that the notional and distributional similarities between marry on the one hand, and 'topological' verbs on the other, will require explanation; and in view of the intuitive similarities in the relationships involved, one would expect this to be in terms of identity of underlying relations—the distinction between them having to do with the 'lexical' characterization of marry (which, as I have noted, may be introduced transformationally) versus that for meet, join, etc. Thus, such phenomena provide in principle further evidence in support of a localistic hypothesis concerning 'grammatical functions': the 'abstract' marry is relationally identical to the possibly 'concrete' meet/join."

Not altogether unrelated to the above classes of predicates is the comparative construction. Reciprocal forms of the above predicates (i.e. non-singular subject + predicator + reciprocal phrase) only occur if all objects involved are, in some sense, of equal status (cf. 'in front of each other', §3.3.2); and, as would be expected, only comparison of equality ('as...as...') permits a reciprocal structure:

10. a. Peter and Fred are as tall as each other

Comparison of inequality ('-er...than...'), on the other hand, involves a reference object and an asymmetric relation; hence, only a non-reciprocal form is possible:

10. b. John and Bill are taller than each other

c. John is taller than Bill

From a diachronic point of view, Small (1924) has argued for a
'spatial' origin of the comparative particle, observing that
"whatever may be the original conception of comparison of inequality
in the parent speech, there are two elements of meaning that have been
traced in this construction from the earliest records on; namely,
the adversative idea (or separative) [cf. divergence] and the idea of
bringing together (sociative) [cf. convergence]. This is evident in
the particles, case-forms, and prepositions that have been used in
comparison throughout all periods...This apparent contradiction means
merely that the two objects are brought together in the mind so that
the contrast, or difference, may be pointed out" (p. 15-16). Small
sees the adversative relation as the more basic (cf. Ross's (1969a)
negative analysis of the comparative, followed up by Seuren (1973)) and
also holds that case forms expressing comparison developed out of the
particle construction (explicitly adversative or disjunctive) rather
than the reverse. Despite the fact that Small gives some rather
questionable psychological interpretations to his observations—a not
uncommon practice at the time of writing—he does present a consider-
able amount of interesting data in support of his hypothesis, and his
discussion of the ablative case form after the comparative in the
Indo-European languages is particularly revealing with respect to the
localist hypothesis and the predicates discussed above:

The Sanskrit represents the general usage. Here the
regular case-form after the comparative is the ablative, which
the Indian grammarians described as indicating the object from
which a separation proceeded (point of departure?). But the
instrumental also is used in this construction. The locative
and the genitive also have a limited use, but in all these cases
the spatial relation is probably implied to some degree. The
prevailing view as to the original case of comparison is in
favor of the ablative, but the question hardly allows of definite
solution and some authoritative writers have favored the
instrumental as the original case of comparison. Germanic and Celtic in the course of their individual development adopted the dative for the comparison of inequality; Greek and Slavic, the genitive. It is probable that these variations from the ablative are separate developments in the individual languages themselves, and that as long as there was one common parent speech the ablative was the accepted form for comparison. But in these variations from the ablative there is really no change of conception; the idea of separation, or difference always predominates, never the idea of means or agent. As a rule the same case-forms that follow the verbs of separation or departure in a language are found consistently after the comparative. This is a general principle applying to all I-E. Languages, and it is a strong proof of the separative nature of comparison. ... At any rate, in the later development of the various languages different elements of the comparative relation came into prominence and the idea of separation was expressed as temporal or as notional, as well as spatial.

(Small, 1924: 25-6)\(^1\)

However, it remains to be seen whether a detailed synchronic analysis of the comparative construction in various languages will reveal the existence of the underlying directional relations which Small has investigated from a diachronic point of view.

A still wider range of linguistic phenomena—to be investigated in more detail in the following chapters—can be brought within the scope of a localist theory of language once existential sentences or existential predicates are demonstrated to be locative in nature. First of all, the directional nature of existential causatives becomes clear\(^2\), adding another kind of triple to the sets in 7. above—cf., for example, that in 11. Also it can be argued that negation,

11. a. John built a bridge over the gully

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1 Cf. also Barnes, 1854, for further observations on the use of ablatives in comparative constructions in non-Indo-European languages.

2 Cf. Anderson, 1971b: 185; also Fillmore’s (1971a) assimilation of F(actitive) to G(oal).
b. There was a bridge over the gully.

c. A storm destroyed the bridge over the gully.

quantification, truth/falsity, coordination, modality and aspect/aktionsarten can be given existential, hence implicitly locative, accounts (cf. Anderson, 1972, 1972a, 1973a, 1973c, 1974:). Temporal expressions, as we shall see, display a complex dependence upon the locative-directional system of the language: not only do they involve negation, quantification and aspectual existential predicates (both locative and directional), but also they enter into co-occurrence restrictions with the proposition-type of the sentence, this latter classification itself being structured upon locative notions.

The notional and expressional overlap of existential and locative expressions has often been pointed out. For instance, Bally (1932: 79) suggests that "la notion d'existence est un cas-limite de localisation "indeterminate". D'ailleurs l'idée d'existence pure repugne à notre esprit; nous ne pouvons dire "il pleut", "il neige" sans évoquer instinctivement l'ambiance, si vague soit-elle, du process. Dieu est involontairement pensé comme localisé dans le monde, hors du monde, au ciel, partout, etc. Si, à titre de curiosité, nous consultons l'histoire, nous constatons que les expressions désignant l'existence remontent à des notions spatiales: "Il y a un Dieu" (γ = lat, hic "ici"); "les médecins sont là pour les malades"; all. "etwas ist vorhanden" (litteralement: "devant les mains"); l'imparfait était = lat. stabat "se tenait debout". Il n'est pas

1 For an investigation into the spatial basis of verbal aspect in some Austronesian languages, cf. Lee, 1974.
douteux que l'indo-européen esti ne confirmat cette vue si l'étymologie en était connue." In a similar vein, Collinson (1937: 50) observes:

"The European languages have no special indicator terms for that which lies beyond a barrier to vision or at too great a distance to be perceived; they have to depend on periphrases. Present means "being at or in the immediate vicinity of a place", especially a place where one is expected to be; absent is its negative. Existent means "present at some time and at some place in the Universe as a whole"; non-existent is its negative. Neither present nor existent serve primarily as indicators, though we often use "He is present" for "He is here" and "He was present" for "He was there". It is to be noted that a connection between indication and existence is suggested by the phrase "There is much gold in South Africa" or "There are lions in Africa", where the spatial indicator expresses existence as against "There's the book I want" in which there is purely spatial" (Cf. also Kahn, 1973).

Lyons has reiterated and strengthened such proposals, hypothesizing that "in many, and perhaps in all, languages existential... constructions derive (both synchronically and diachronically) from locatives" (Lyons, 1968b: 496; cf. also Lyons, 1968a: § 8.4.3; 1967). Recently, he has developed this hypothesis further, within the framework of a theory of reference based on the deictic mechanisms in

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1 'Indicators' are those linguistic devices used by the speaker "either to point to (or away from) some item with a view to making his partner deal with that item, or to mark some item already presented with a view to retaining his partner's interest in it." (Collinson, 1937: 18).
language (see below), proposing an analysis of existential sentences compatible with the views of some 20th century empiricists (e.g., Russell, Ayer) "who would say that existential statements are logically equivalent to pointing, or deixis" (Lyons, 1967: 391). In particular, Lyons (1973: 25-6) proposes that "granted that John Smith is here and There are some unicorns here are derivable from underlying structures in which the proximal deixtic adverbial occurs as the predicate and that we interpret these sentences in terms of the notion of deixtic existence", what might be called absolute existential sentences such as John Smith exists and There are unicorns (or Unicorns exist) are derived syntactically from the same underlying structures, except that it is there which occurs as the predicate. Just as the meaning of the weak demonstrative pronoun that is derived by abstraction from the gesture of pointing, so the weak demonstrative adverb there is derived by abstraction from the notion of location in the deixic context. If the underlying structure of the man is taken to be that there man (derivable in various ways as we have seen), this can be said to separate and segmentalize the components of context-dependent uniqueness of reference (that) and existential presupposition or implication.

\[\text{\textsuperscript{1}}\] 'Deixtic existence' is defined as "location in a physical space, whose co-ordinates are established by the utterance of sentences of a given language system" (Lyons, 1973: 24).
In the theory of reference proposed by Lyons, pronouns and definite noun phrases (cf. the above quotation)—the main kinds of referring expressions other than proper nouns—are analyzed grammatically and semantically as being derived from "the deictic function of demonstrative pronouns and adverbs in what might be loosely described a concrete or practical situations" (Lyons, 1973: 1). In this respect, it can be regarded as a localistic theory of reference. Furthermore, insofar as anaphora and the use and function of referring expressions for displaced entities or imaginary, hypothetical ones can be treated as derivative of the deictically referring expressions, still more language phenomena is potentially capable of being encompassed within such a conception of language structure.

For example, Lyons views anaphora as involving "the transference of what are basically deictic, and more specifically spatial, notions to the temporal dimension of the context of utterance and the reinterpretation of deictic existence in terms of what might be called textual existence. The referent of course does not exist in the text. But it is located in the universe of discourse (which derives its temporal structure from the text) by means of an antecedent expression which either introduces or identifies a referent. Subsequent reference to this referent by means of an anaphoric expression identifies the referent in terms of the textual location of the antecedent" (Lyons, 1973: 28).

Lyons also remarks (1973: 34): "To introduce the existential quantifier into the underlying structures of natural languages without giving it an interpretation in terms of some intuitive notion of existential predication is, to my mind, to put the cart before the horse; and I would suggest that the most satisfactory interpretation of existential quantification is in terms of a basically locative predicate, as proposed here." The analysis of existential quantifiers (and quantification in general) presented in this thesis exemplifies the same point of view—cf. p. above and §7.3.5.
From the preceding discussion, one can see that the localist hypothesis, if interpreted broadly enough, can be entertained in a large number of linguistic domains. Furthermore, it should be apparent that such a hypothesis forms only a part of a much more comprehensive theory of (semantic) extension and abstraction in language. The localist hypothesis is but one particularly interesting and pervasive manifestation of the functioning in language of metaphorical extension from the concrete to the abstract. And it is perhaps significant that in his diachronically oriented discussion of the phenomenon—i.e., the development of "refined and abstract meanings" from more concrete ones—the examples which Bloomfield cites are locational ones: "Meanings of the type 'respond accurately to (things or speech)' develop again and again from meanings like 'be near to' or 'get hold of.' Thus, understand... seems to have meant 'stand round' or 'stand before'; the Old English equivalent forstanan appear both for 'understand' and for 'protect, defend.' Ancient Greek ἐπιστάμαι 'I understand' is literally 'I stand upon,' and Sanskrit āvāgacchatā is both 'he goes down into' and 'he understands.'... Most of our abstract vocabulary consists of borrowings from Latin, through French or in gallicized form; the Latin originals can largely be traced to concrete meanings. Thus Latin definire 'to define' is literally 'to set bounds to' (finis 'end, boundary')" (Bloomfield, 1933: 429-30).

In addition, philosophers who have concerned themselves with language have often noted this process of abstraction, particularly with reference to the meanings of prepositions. For example, Condillac, whose ideas on the acquisition of knowledge were strongly
influenced by the empiricist Locke, and who therefore viewed abstract and complex conceptual structures as ultimately deriving from the influx of sense data into the human organism, presented a localistic account of the French prepositions in his *Cours d'études pour l'instruction du Prince de Parme*. He states (1775: 479): "Le premier emploi des prépositions a été de marquer des rapports entre les objets sensibles. Mais parce que les idées abstraites, exprimées par des noms substantifs, prennent, dans notre imagination, presque autant de réalité que les choses en ont au dehors, elles peuvent être considérées comme ayant entr'elles des rapports à peu près semblables à ceux qui sont entre les objets sensibles. C'est pourquoi on dit *de la vertu au vice comme de la ville à la campagne*." Even Leibniz, who on the whole attributed to sense experience a much smaller role in the build-up of conceptual knowledge, offers similar reflections on the semantic development of the prepositions: "Il sera bon cependant de considérer *cette analogie* des choses sensibles et insensibles, qui a servi de fondement aux tropes: c'est-ce qu'on entendra mieux en considérant un exemple fort étendu tel qu'est celui que fournit l'usage des prépositions, comme à, avec, de, devant, en, hors, par, pour, sur, vers, que sont prises du lieu, de la distance, et du mouvement, et transférées depuis à toute sorte de changemens, ordres, suites, différences, convenances" (Leibniz, 1704: 298).

Another major form of extension is that from the ego to the non-ego. This should not be regarded as a binary distinction, but rather as a parameter admitting of degrees or different stages of extension: perhaps something like 12. below:
12. speaker → speech act participant → human → animal → animate → entity/thing.

That is, the interpretation of non-ego will depend upon which of the progressively more comprehensive classes of entities the speaker is identifying himself with. Traditional accounts of such anthropocentric and egocentric extension have usually been confined to the lexical level of language.¹ Ullmann (1964) gives examples such as 'the brow of a hill', 'the ribs of a vault', 'the mouth of a river', 'the lungs of the town', 'the heart of the matter', 'the sinews of war', 'the hands of a clock', and one can easily add many more. It is pointed out by Ullmann that this principle of meaning transfer had been recognized explicitly at least as early as the 18th century by the Italian philosopher Giambattista Vico: "In all language ... the greater part of expressions referring to inanimate objects are taken by transfer from the human body and its part, from human senses and human passions... Ignorant man makes himself into the yardstick of the universe" (quoted by Ullmann, 1964: 214).

However, a different and perhaps more subtle aspect of this same phenomenon has already been touched upon in our discussion (cf. §3.3) of the role the human speaker-observer plays in structuring and orienting the spatial vectorial system and in polarizing objects with

¹ However, Kuryłowicz (1972), has also investigated this aspect of language from a grammatical and diachronic point of view and concludes (p. 176) that "the unmarked character of HUMAN accounts for the ANTHROPOCENTRIC nature of language... The spread of derivational and inflectional procedures from human to inanimate may be considered a diachronic universal and an important chronological criterion in internal reconstruction."
no inherent orientation of their own, the side nearest or visible to the observer being covertly the 'face' or 'front' and the other sides being the 'back', 'left' and 'right' accordingly (i.e., on analogy to the structure of the human body). Both these types of orientation induced by the observer are involved in the elucidation of the meanings of spatial expressions, as we have seen. This type of ego- and anthropocentric extension assumes many roles and has many variations; it needs to be analyzed in much more detail, especially if one attempts to explain temporal metaphors on the basis of such subjectivized orientations (cf. Traugott, 1974).

Thus, the role of the human body—in particular that of the speaker—observer—is a paramount one; and it may indeed be as central to language structure as the thesis of localism, since any spatio-temporal framework will be structured by objects and their inherent orientational properties, the central object of the system being, for each individual, himself, the ego. Relevant here are Strawson's (1959) claims, within his argument that the system of spatio-temporal relations serves as the framework for the identification of particulars (cf. Lyons, 1973); (1) that the basic particulars which can constitute such a framework are material objects (i.e., those having extension in space and time), (2) that the proper use of such a framework depends upon each speaker occupying a place in it and knowing that place, and (3) that "for each person there is one body which occupies a certain causal position which in various ways is unique in relation to each of the various kinds of perceptual experience he has" (p. 92).
4.3 Psycholinguistic evidence

So far we have summarized the types of arguments—syntactic and semantic, diachronous and synchronous—which can be brought forward in support of the localist hypothesis and have placed such a thesis within a broader, though admittedly still ill-defined, theory of abstraction and extension in natural languages. There remains the question of whether such a hypothesis receives any psycholinguistic support since this is an obvious area where it should be feasible to put the theory to test, either in the realm of language use or in that of language ontogeny. We will confine our remarks to the latter.

Wales (1971) suggests that a reasonable strategy for testing the viability of the localist hypothesis would be to "try and find out if the young child starts out by imposing an interpretation on prepositional sentences which reveals any precedence for the acquisition of 'local' or 'concrete' functions". He maintains that "this is a potentially fruitful area of study both because, as Anderson (1971b: 17) points out "it is doubtful whether there are cases (or prepositions) which are only ever 'concrete' in the strict sense"; also because any positive results should add more fuel to the 'perceptual antecedents of linguistic structures' hypothesis" (p. 4).

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1 It should be pointed out that all the arguments—recurrent syncretisms (both diachronous and (pan-)synchronous), syntactic parallelisms, shared semantic relations—are 'structured' by considerations of naturalness, that is, by the assumption that such correspondences, repeated again and again, are not due to chance and that the same principles underlying these correspondences on the synchronic level are also responsible for the corresponding diachronic developments (cf. Hjelmslev, 1935: 104; Zwicky, 1968; Anderson, 1973a: 21).
Unfortunately, this strategy does not appear to have been implemented. Not only have specific, testable hypotheses not been put forward, but also the results of those studies which could be brought to bear on the viability of the theory are most often inconclusive, if not contradictory, mainly because it is difficult to determine which factors in the child's development are criterial.

For example, Bowerman (1973: 142-3), in her study on the acquisition of Finnish by two two-year-old children, noted that in the case of Rina, the allative case ending was used first to mark the indirect object, and only several months later did it come to mark the goal of directed motion. Similarly, the adessive case was first used by Rina to mark the possessor, several weeks later to mark instruments, and only several months after that to mark locations ('on', 'at', 'near'). However, for the other child, Seppo, these case inflections were first used exclusively in their locative functions. A no doubt too simplistic prediction from the localist hypothesis would have been one in favour of the acquisitional pattern exemplified by Seppo. However, there is evidence from one other study to consider in this respect. Slobin (1966) observed, in the acquisitional chronologies of a two-year-old Russian child, Zhenya, that when a new case inflection was acquired, it was used in several functions at once.

The data which Wales discusses (Wales, 1971) does not, in any obvious way, represent the implementation of such a strategy (although it does support Clark's 'over-extension' principle entailed by her Semantic Feature Hypothesis (E. Clark, 1973) within the area of spatial expressions and the locative/directional distinction). Nevertheless, he concludes that "there is good ground for believing that localist theories represent a conception of linguistic structures which reflects some of the most important relations being acquired by the young child. Further the nature of some of these relations look very much like the relations fundamental to perception" (Wales, 1971: 10-11).
For example, the first datives were used both to mark the indirect object of an action and the individual towards which some movement was directed. Similarly the instrumental, once acquired, was used immediately to mark the instrumental, commitative, and goal function. Slobin suggests (p. 137) that "the child understood these distinctions before he began using the declensions--when his nouns were still unmarked--and that acquisition and differentiation of the markers and their senses reflects this earlier knowledge." Thus, in assessing such linguistic developmental patterns, one must be careful to take into consideration the corresponding patterns of perceptual and conceptual development. Traugott (1974) has also suggested that one must not overlook the interaction with posited universals of perceptual strategies, which constrain the learning process, and natural processes, which may either lead to a reduction in contrast (e.g., phonological processes) or to a maximization of contrast (e.g., morpho-syntactical processes).

Another factor to consider, issuing from what has been said above about the position a localist theory occupies within a broader theory of extension and abstraction, is that both the concrete → abstract and the ego → non-ego parameters are quite likely operating and interacting at the same time in the child's cognitive and linguistic development. The latter parameter is also involved in indirect object and possessive relationships and may in part be responsible for the discrepancies noted above with respect to which functions of a case inflection were acquired earlier. That is, rather than associating case inflections with locative/directional relationships (whether concrete or abstract), Rina may have first
associated them with the marking of possession—with high ego-rating—in its various aspects, not realizing that inherent properties of the verb and/or animacy of the referent of inflected noun and word order were pertinent and in Finnish sufficient in this respect. Hence, the spatial function of the case forms could not be assimilated to those of the abstract ones until this mistake was rectified.

However, it is obvious that no really significant generalisations can be made from the developmental patterns of one or two children; the most that can be gained at this point is knowledge of areas which might prove fruitful for experimentation with larger and more controlled samples.

There is another problem which interferes with validating the localist hypothesis, and any theory of extension/abstraction in general, from language ontogeny. This is determining whether to relate acquisitional chronologies to semantic complexity or to syntactic (derivational) complexity. For example, the Russian child Zhenya (cf. Bowerman, 1973: 191) first used the accusative case inflection only in marking 'objects affected', particularly those involved in typically concrete (causative) journeys, as in sentences with 'give', 'carry', 'put', and 'throw'. Only later did he use it for what may be called 'objects of instantiation or performance', such as in sentences with 'read', and 'objects effectuated', such as in sentences with 'draw', 'make'. At first glance this would

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1 It must also be taken into consideration when assessing this data from Russian that the accusative is not distinct from the nominative in most nouns—only in those of feminine gender—and that masculine animate nouns functioning as object of a transitive verb appear in the genitive rather than in the accusative/nominative form (cf. Lyons, 1968a: § 7.4.3). These complicating factors would involve the child in some rather complex hypothesizing.
appear to support the localist hypothesis, the more abstract
(existential) functions being acquired after the more concrete
(spatial) ones. However, it must not be overlooked that since the
superficial structural relationships are the same in both cases, the
more abstract semantic relations have correlated with them a more
complex syntactic derivation. Although these two ways of looking
at the data are by no means mutually exclusive, each would have its
own implications for the concomitant cognitive stage of the child,
semantic complexity relating to the acquisition of such abstract
concepts as "bring something into existence", the other to the
acquisition of principles relating cognitive or semantic structures
to linguistic forms.

To conclude this discussion, it is worthwhile to point out the
consequences of a localist theory of language, as has been sketched
out here, for the theory of language universals. A panchronic thesis
of localism would claim such underlying relations as location and
direction (or order) to be substantive linguistic universals.
However, because such relations have perceptual correlates and are
exemplified in the environments of all language users, no claim for
innateness need be attached to such universals. This has been
pointed out by Anderson (1973a: 44): "On the contrary, the accumula-
tion of support for localist (and thus notional) conceptions of case
and other categories, and in particular for ontogenetic priority for
the 'concrete' variants of these, would provide decisive counter-
evidence to any claim of an innate status for the particular substant-
tive universals of language. The essential determinant in such
instances would be our perception of the physical environment."
Thus what might be innate are perhaps formal universals of perception and a hierarchy of interest and attention (cf. Atkinson & Griffiths, 1973).
5.1 General remarks

In English, as in other Indo-European languages, temporal relations and specification are realized both grammatically and lexically and also by expressions intermediate between these two extremes. On the one hand, there is the small, closed set of morphological contrasts in the verb system, correlating in some way with temporal deixis, and constituting the grammatical category of tense (cf. Lyons, 1968a: § 7.5.1). On the other, there is the rich, open system comprised by temporal adverbials, where these may be entirely lexical ('yesterday', 'today', 'soon') or syntagmatic constructions based on temporal noun phrases and/or temporal prepositions and conjunctions ('last night', 'since yesterday', 'until John wakes up', 'for three hours'). This situation is, however, by no means universal: many languages do not have tense in the restricted interpretation of the category as involving some kind of (superficial) variation in the verb system. Rather, the semantic distinctions involved are expressed (or expressible) by more lexical means (cf. Anderson, 1972: § 12; Lyons, forthcoming: § 12.1).

Despite the non-universality of tense and the restricted gamut of semantic distinctions which it realizes when compared to that of the system of temporal adverbials, it is tense which has inevitably attracted the attention of linguists working on English, almost to the entire exclusion of the temporal adverbials. This has had not only the unfortunate consequence that most of the semantics of time
was for a long time left unexplored but also the disastrous result that the semantic analysis of tense forms was given the appearance of requiring the recognition of extreme polysemy or of escaping systematization altogether, simply because the role of temporal adverbials (both their presence or absence and their semantic content) was not taken explicitly into account. We will return to a more extensive discussion of the relationship between tense and temporal adverbials in § 5.2.2. However, at this point we wish to emphasize that our ultimate concern is with the analysis of temporal adverbials and their interaction with other elements of the sentence, only one of which is tense.

Our investigation of the intra-sentential context of particular temporal adverbials will be directed towards explaining both the co-occurrence restrictions and possibilities displayed by these expressions and their range of possible interpretations. These two contextual considerations we will call respectively the co-occurrence potential and interpretation potential of an expression. With respect to the interpretation potential of an expression, Bull (1960: 111) makes a distinction, regarding the realization of semantic structure (though not in these terms), between the meaning

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1 There are, of course, exceptions to this statement. Fijn van Draat (1904, 1910, 1912) treated with clarity and thoroughness the semantics of the adverb, preposition and conjunction 'since', explicitly taking into account the contextual role of tense. To Bull (1960) we owe, in particular, our present understanding of the semantics of calendar and clock expressions. The meanings of the temporal prepositions 'at', 'on', 'in', 'for' and 'by' was fully documented, in an informal format, by Sandhagen (1956). Most recently there is the comprehensive and systematic semantic analysis of Leech (1969).
and the function of an expression and suggests that the latter is just as systematizable as the former:

It is important...to observe that there is a significant difference between the content of a message and how the message gets sent and that all the information in a message need not be represented by linguistic symbols. It seems proper to conclude that some (perhaps all) symbols play two roles in message sending. The symbols may be considered, first, to be content bearers and, second, they may be treated as entities which have the power to generate through their interaction with other symbols additional information which is not represented symbolically.... The number of such combinations is theoretically infinite since every language contains open systems. It does not follow that each combination generates unique information. Man cannot operate with an infinite potential, for learning how to communicate would thus be impossible. It cannot be assumed, either, that this generative power operates haphazardly or randomly in a kind of on-again off-again fashion. This would also make communication impossible. It must be concluded that every form has a fairly stable combinatorial potential and that the nonsymbolized information is generated in a predictable fashion.

Later on (p. 112), Bull makes the distinction more precise, as involving the exchange value¹ of an expression within its own system.

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¹ Bull's use of the term 'exchange value' is reminiscent of Saussure's (1955: §5) notion of 'la valeur d'un mot'-more precisely, 'la partie conceptuelle de la valeur'—which is determined by the 'associative' and 'syntagmatic' relations it contracts with other units on the same level of linguistic description (cf. also Firth's (1935) notion of 'substitution-counter'.) However, in his application of the term to expressions within a set or system, Bull might appear to be restricting the range of semantic oppositions to the paradigmatic dimension insofar as membership in the set is dependent upon membership in the same 'form class' as well upon membership in a given 'conceptual' system. Saussure's notion of associative relations, however, embraces relations or oppositions which are not necessarily paradigmatic (i.e. "which hold between the actual occurring element and other elements of the same level which might have occurred in its place" (Lyons, 1973a:112)). For example 'enseignement' is considered to be associatively related to 'enseigner', 'enseignons' as well as to 'education', 'apprentissage', etc. However, there is no real discrepancy here for Bull's formulation of the exchange value of an element in such a set as "that which establishes it as a unique entity standing in semantic contrast with all the other members of its set" does not necessarily exclude the contribution made by such non-paradigmatic associative sense relations nor of such syntagmatic ones relations as those between 'blond' and 'hair', 'slap' and 'hand', 'kiss' and 'lips', etc.
(roughly, its 'sense'--cf. Lyons, 1968a: §10.1) versus the exchange value of the system to which the expression belongs with respect to other systems with which it interacts:

When any form class contains two or more symbols representing a given conceptual system, these symbols constitute what may be called a set. The meaning of a member of a set is that which establishes it as a unique entity standing in semantic contrast with all the other members of its set. This is the exchange value of the symbol within its own set or system. The function of a symbol in communication, in contrast with its meaning, is something that it shares with all the members of its set. Thus any time scalar in Spanish may measure either the length of an event or the interval between two events. This variable potential is not indicated morphemically; it can be made manifest only by the presence of some other potential which eliminates one variable. The function of a symbol, as a result, may be defined as the product of its interaction with a second symbol (or some nonsymbolic factor) representing another conceptual system."

corresponds to Bull's 'semantic function'--what we have called the interpretation potential of an expression, a particular instantiation of which, in a given context, is an interpretation. We wish to claim that, in principle, the co-occurrence and interpretation potential of a given temporal adverbial is deducible from its semantic structure and that

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Cf. the similar, though not necessarily identical, distinctions of 'lexical' versus 'class'/ 'structural'/ 'construtional'/ 'grammatical' meaning of the American structuralists (Bloomfield, 1933; Fries, 1954; Hockett, 1958; Gleason, 1965), 'formal' versus 'contextual' meaning of Firth and his followers (cf. Ellis, 1966), 'lexicon'/'dictionary' versus 'projection rules' (cf. Katz & Fodor, 1964; Katz & Postal, 1964); and 'lexical' versus 'contextual' predicates of Antinucci & Parisi (1971: "In any model of the lexicon a distinction has to be drawn within a lexical entry, between lexical predicates which are expressed by a given lexical item in each and every of its uses, and contextual predicates which are expressed only when specific contextual conditions are satisfied" (pp. 30-1)). We may mention also Bennett's (1972) account of 'over'/ 'under' (cf. § 2.4): although he does not explore the relevance of the context, he does attempt to capture the notion of 'interpretation potential' in terms similar to those of Antinucci and Parisi.
of the elements of the sentence in which it occurs. What follows is an enumeration and discussion—essentially observational in nature—of those contextual factors which appear to have some semantic interaction with the temporal adverbials.

5.2 Contextual factors

5.2.1 The noun phrase within the temporal adverbial

It has already been observed (§4.2) that, as far as prepositional phrases are concerned, the distinction between spatial and temporal is often determined with respect to the semantic properties of the governed noun phrase. That is, there is a fairly substantial number of prepositions which appear to be simply locative or directional and whose application to a spatial or a temporal domain depends upon whether the governed noun phrase denotes a spatial or temporal entity—or both (i.e., a situation). Other prepositions, such as 'across', 'along', 'beside', have, in general, only spatial applications and others, such as 'since', 'until', 'during', only temporal ones. These, accordingly, will have to include reference to spatial or temporal domains, respectively, in their semantic characterizations.2

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1 Cf. McKay, 1968 (for German); Lyons, 1968a: §7.4.6; J. Geis, 1970.

2 Note that although in the case of the purely spatial prepositions the restrictions can perhaps be handled simply in terms of co-occurrence restriction, this will not be feasible in the case of the purely temporal ones: as we have seen (§4.2) they can co-occur with spatial noun phrases, but their interpretation remains temporal.
Although such considerations are not, strictly speaking, a matter of the context of the adverbial but rather of its internal structure, it is useful at this point to pursue the discussion of the role of the governed noun phrase (or the 'adverbial nominal' in cases where no preposition is realized--cf. Bolinger, 1971) somewhat further, as it is relevant to the semantic analysis of particular prepositions which co-occur with different types of noun phrases and consequently to a classification of temporal adverbials.

For example, although in both 1.a. and 1.b. below the object of

1.a. The secretary was absent for three days last week

b. The secretary was absent for the first time last week

'for' is a temporal noun phrase, in the a. sentence the function of the temporal adverbial 'for three days' is that of giving the temporal duration or extension of the secretary's being absent whereas in the b. sentence 'for the first time' gives (roughly speaking) the temporal 'ordinality' or position of her being absent. This difference obviously correlates with the fact that 'three hours' denotes a temporal measure whereas 'the first time' identifies a unique member of a set or sequence of temporal entities. Similarly, in examples 2.a. and 2.b. we have a difference in function of the

2.a. Fred wrote his best novel in 1970

b. Fred wrote his best novel in five months

'in'-adverbials—locational versus expending—correlating with a noun phrase denoting a uniquely identifiable temporal interval

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1 The reason for choosing this term will become clear later on—cf. §5.2.3.
versus one denoting, again, a temporal measure. Compare also sentences 3.a. and 3.b. in which a contrast between a locational

3.a. Geoff called by on Friday
b. Geoff called by on two occasions (on Friday)

function and a temporal 'cardinality' function of the 'on'-adverbial is, again, determined by the semantic properties of the temporal noun phrase: the first denotes a uniquely identifiable temporal interval (in conjunction with the tense specification) whereas the second denotes a numerically quantified set of temporal entities.

We may contrast examples 1. through 3. with those below. The

4.a. The secretary was absent all week/three days last week
b. The secretary was absent a second time last week
5.a. Fred wrote his best novel last year
b. Fred wrote his best novel amazingly quickly
6.a. Geoff called by today
b. Geoff called by twice (today)

same semantic distinctions are relevant; but this time the temporal adverbial is, superficially, a simple noun phrase or an adverb. However, such adverbs as 'twice' and 'quickly' can plausibly be related to structures identical with or similar to those underlying 'two times'/on two occasions' and 'in a short period of time', respectively. And such adverbial nominals as 'all week', 'last year' and 'today' are distinguishable as a class by their deictic reference, and the non-occurrence of a preposition can perhaps be correlated with this property (but cf. 'all during last week'). Finally, the second continuation of 4.a. and sentence 4.b. reveal that 'for' may optionally not occur in such contexts. Thus, the
differences in semantic function of various temporal adverbials can be associated uniformly with the semantic properties of the noun phrase and of an implicit or explicit preposition (cf. 'for three days' versus 'in three days').

Further discussion and amplification of the distinctions made above with respect to the semantics of temporal adverbials and temporal nouns or noun phrases will be postponed until we have discussed the structuring of time and the temporal axis (cf. §7.4). For the present, we will operate with the above informal classification of temporal adverbials according to their semantic function—locational, durational, expending, ordering and counting. (Frequency adverbials can be regarded as the special case of counting adverbials in which the temporal interval to which the counting is restricted)

To these we must add a class of aspectual adverbs (for lack of a better term) to include such expressions as 'still', 'yet', 'already' and 'anymore'. This class deviates from the others in not being relatable to a complex of preposition plus temporal noun phrase. However, the reason for this will become obvious once we investigate their semantic structure in detail (cf. §8.3).

Furthermore, we do not wish to exclude the possibility of more than one semantic function being comprehended within a single adverbial.
for the last hour' is both durational and locational; 'until noon' is both durational and aspectual (cf. § 8.4). Let us now proceed to the investigation of how these semantic functions are related to and restricted by other elements of the sentences in which they occur.

5.2.2 Tense

Before exploring the interaction of tense and temporal adverbials, we must establish exactly what we are comprehending under the rubric of 'tense'. Lyons (forthcoming: 481) characterizes tense in the following manner: "Tense, in those languages which have tense, is part of the deictic frame of reference: it grammaticalizes the relationship which holds between the time of the event, state, process or activity that is described or referred to (in the statement that is made in uttering the sentence) and the time of utterance". Accordingly, the primary tense distinction in English, and the only one which is obligatory, is that between the 'past' and the 'non-past', the former being the marked member of the pair, the latter the unmarked member. The past tense typically establishes (or reflects the establishment of) a relationship of precedence of the temporal location of the situation encoded by the sentence with respect to its moment of utterance, this being the primary deictic point of...
reference. The non-past tense, when in contrast with the past tense, expresses (or reflects) a relationship of coincidence (or overlapping) of the temporal location of the denoted situation with the moment of utterance—i.e., of contemporaneity. However, as the unmarked member, the non-past has other applications as well—in generic sentences, in sentences describing future situations (i.e., following the moment of utterance), in narrative texts (the 'historic present')—and these, in general, will correlate with particular properties of the sentence (e.g., generic noun phrases and the absence of temporal adverbials, temporal adverbials with future or past time reference).

A secondary tense distinction in English is that realized by 'have' plus the past participle of the main verb, the so-called perfect form. It is secondary in two senses. First, it is neither obligatory nor quite as 'grammatical' as the past/non-past distinction, being realized (in part) by an independent auxiliary verb which can possibly be related to non-auxiliary uses of 'have' (cf. Benveniste, 1960; Anderson, 1972). Secondly, it has only a derivative relationship to temporal deixis. Its basic semantic function is the establishment of a temporal interval within which the situation described is located or occurs. This interval is defined with respect to a beginning and an end point. The latter is the primary deictic point of reference (if the primary tense distinction is non-past, e.g., *has worked*) or a secondary deictic point of reference preceding or following the time of utterance (which is established by the past tense or an auxiliary, e.g., *had worked, will have worked*). The former is a point of time (often unspecified) preceding the point
of reference. Although the use of the perfect form has, in sentences describing certain types of situations, particular 'aspectual implications, we maintain that its basic function is the expression of a temporal relation—in particular, of the inclusion of the temporal location and/or extension of the denoted situation within the bounds of an interval beginning before and including, as end point, a deictic point of reference. Because of these two elements of 'inclusion' in its semantic characterization, we will refer to have -en as the 'inclusive' form and its underlying counterpart as 'inclusive' tense.

The expression of futurity by means of the auxiliary verb 'will'/'shall' is more accurately viewed as (partially) derivative of its basic modal and/or illocutionary function (e.g. predictive, promissory, intentional—cf. McIntosh, 1966; Lyons, 1968a: § 7.5; Boyd & Thorne, 1969; Kuryłowicz, 1972) than as part of the tense system of English. For not all sentences with 'will' describe situations located in the future, nor is 'will' found in all sentences having a future time reference. As important as the modal verb in locating the situation denoted by a sentence in the sphere of time following the moment of utterance, to, are temporal adverbials and the nature.

Thus we feel it is unnecessary to make an appeal to polysemy in the case of the meaning of the 'perfect' form (as is done, for example, in Leech, 1969; McCawley, 1971b) as long as the full range of contextual factors are taken into account (cf. Csa, 1963; Dillon, 1973).
of the situation concerned. As we do not wish to embroil ourselves in the complexities of the semantic analysis of modals (cf. for example, Huddleston, 1969; Leech, 1969; Householder, 1971; Anderson, 1971), we will try to avoid the discussion of sentences involving 'will'/'shall' when the element of futurity is not crucial to the analysis of the temporal adverbials concerned and, in particular, when judgements of implicational relationships may be blurred because of the modal backdrop.

The two remaining and optional constituents of the verbal auxiliary—the progressive and passive constructions—are not essentially concerned with temporal (let alone deictic) relations and hence are not to be dealt with under tense. The progressive

1. John will be in Montreal {at this very moment tomorrow
2. John will be {arriving at} Montreal {at this very moment tomorrow
3. John will have arrived at Montreal {by now by tomorrow

Only when the prediction involves the happening or taking place of an activity or event at or in a time does the prediction imply future reference:

4. John will {draw up the contract} {at this very moment tomorrow

[This is demonstrated by the fact that sentences with 'will' expressing predictions concerning the existence of states at a point in time, the on-goingness of activities at a point in time, and the taking place of events or activities prior to some point of time may pertain to the present (i.e. the point in time is $t_0$) as well as to the future (i.e. the point in time follows $t_0$). In these cases, the temporal adverbial is criterial in establishing the time reference:

1. John will be in Montreal {at this very moment tomorrow
2. John will be {arriving at} Montreal {at this very moment tomorrow
3. John will have arrived at Montreal {by now by tomorrow

Only when the prediction involves the happening or taking place of an activity or event at or in a time does the prediction imply future reference:

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Only when the prediction involves the happening or taking place of an activity or event at or in a time does the prediction imply future reference:

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1. John will be in Montreal {at this very moment tomorrow
2. John will be {arriving at} Montreal {at this very moment tomorrow
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Only when the prediction involves the happening or taking place of an activity or event at or in a time does the prediction imply future reference:

4. John will {draw up the contract} {at this very moment tomorrow

[This is demonstrated by the fact that sentences with 'will' expressing predictions concerning the existence of states at a point in time, the on-goingness of activities at a point in time, and the taking place of events or activities prior to some point of time may pertain to the present (i.e. the point in time is $t_0$) as well as to the future (i.e. the point in time follows $t_0$). In these cases, the temporal adverbial is criterial in establishing the time reference:
form (be -ing) realizes an aspectual (existential) element, and its relation to temporal adverbials will be discussed in §5.2.3 below.

The passive construction, although having at least a diachronic relationship with inclusive tense (cf. Lyons, 1968a: §8.4) is here regarded as having a basically thematic function and will not be included in the following discussion. Verb forms which are neither inclusive nor progressive nor passive will be referred to as 'simple'.

The general range of interrelationships between tense and temporal adverbials can be illustrated by the following sentences. Those in set A exemplify co-occurrence restrictions; these predictably involving temporal adverbials with deictic reference, including the aspectual adverbs, while those in set B are concerned with the interpretation—more specifically, the referent—of the time adverbial as conditioned by the tense of the sentence.

A. 7.a. John went to London \{yesterday
\*tomorrow

b. John will
is going to go to London \{yesterday
\*tomorrow

8.a. John has done a lot of work \{today
\*yesterday

b. John did a lot of work \{today
\*yesterday

9.a. Fred \{was
\has been\ on holiday for \{the past two months
\*the next two months

b. Fred \{will be
\is\ on holiday for \{\*the past two months
the next two months
10.a. i. John has been sleeping since noon/all afternoon

ii. John has been sleeping *from noon until 6:00*/
    all yesterday afternoon

b. i. *John was sleeping since noon

ii. John was sleeping from noon until 6:00/all
    (yesterday) afternoon

A sentence such as this is, of course, possible if the durational adverbial (and the progressive form) is construed as part of the predicate, all of which is within the scope of the inclusive tense. Such an interpretation in the particular case at hand can be roughly characterized as "What John has done is be sleeping from noon until 6:00". It is this interpretation which lends itself further and perhaps more naturally to one of iteration or habitual action--cf. 1. below--in which case a second durational adverbial

1. John has been sleeping from noon until 6:00
   (ever) since he was put on the night shift
   all this month
   these days

more characteristic of the inclusive tense co-occurs. However, there are additional complexities with such constructions as 1. which we can not go into here but which will be touched upon in the following chapters. We may note, however, that if the progressive form is removed from 10.a.ii, yielding 2.,

2. John has slept from noon until 6:00

the parallelism between the possible interpretation of 10.a.ii with that of such inclusive-tense sentences as 3. becomes clearer.

3. John has walked from Land's End to John o'Groats

Similar observations hold for sentences such as 4. and 5. below.

4. John has been sleeping for two hours

5. John has slept for two hours

However in this case the fact that 'for two hours', 'unlike 'from... until...', has only a durational and not a locational function makes it possible to interpret the sentences as describing either a situation which has lasted (at least) two hours, which period is located before the time of utterance or one which has so far (i.e. including to) lasted two hours. It is not clear at this point whether such constructions must be analyzed as ambiguous or are simply ambivalent with respect to the relationship between the location of the end point of the measured temporal interval and to.

Again, we will be discussing these constructions in more detail in Chapter 7. and 8.
11.a. Fred has broken his leg skiing before (now)
   b. ?Fred broke his leg skiing before (now)

12.a. i. Mary has already eaten dinner
       ii. Mary has not yet eaten dinner
   b. i. Mary already ate dinner¹
       ii. Mary didn't eat dinner yet

B. 13.a. i. John wrote his exam on Monday
       ii. John wrote his exam this afternoon/this September
   b. i. John will write his exam on Monday
       ii. John will write his exam this afternoon/this September

14.a. Fred received two phone calls this morning
   b. Fred has received two phone calls this morning

15.a. Fred was away for two months
   b. Fred has been away for two months
   c. Fred is away for two months
   d. Fred will be away for two months

C. 16.a. John works in Glasgow
   b. John often works in Glasgow
   c. John works in Glasgow as of next week

In 13.a.i., because of the past tense, the interval of time referred to must be that Monday immediately preceding the day including the time of utterance \(t_o\) whereas in 13.b.i. the future reference associated with 'will' establishes the time interval as that Monday immediately following the day including \(t_o\). Similar observations hold in the case of 'this September' in 13.a.ii. and 13.b.ii.

¹ Sentences such as these, especially with 'already', are acceptable in some dialects of American English. Cf. also fn. 1 p. 197.
However, 'this afternoon' allows another possibility: in both 13.a.ii. and 13.b.ii. the interval of time referred to by 'this afternoon' may include $t_0$. In sentence 14.b., the period referred to by 'this morning' must include $t_0$; in 14.a. it need not do so. (See Leech, 1969: 7.1; Fillmore, 1971b; and Huddleston, 1969 for some discussion of these observations.) In sentence 15.a., 'for two months' will be understood as the measure of an interval which totally precedes $t_0$; in 15.b. an interval extending up to and including $t_0$ (but cf. fn. 1 p. 197); in 15.c. an interval including and extending from (though not necessarily beginning at) $t_0$; and in 15.d. an interval beginning and ending after $t_0$ (although not excluding the possibility that Fred is already away at $t_0$). Sentence 16.a. is understood as describing a more or less timeless state of affairs; sentence 16.b. an activity repeated (with a fairly high frequency) within an interval including $t_0$; and sentence 16.c. the future inception of an activity or a state of affairs¹ (cf. Crystal, 1966; Leech, 1969: 97.4; for some discussion).

Although scattered, informal and usually incidental remarks and generalizations have been made throughout the linguistic literature on the co-occurrence and interpretation potential of tenses with

¹ This interpretation is more frequent and natural when the verb is in the progressive form (and even more so, of course, if 'will' or 'is going to' is also present). 16.c. is appropriate only when the statement involves a future arrangement or happening as decreed, calculated, or scheduled (cf. Huddleston, 1969). For example, 16.c. could be uttered by John's manager or someone reporting the manager's decision.
respect to temporal adverbials or (less often) vice versa, the first systematic investigation into the interaction of tense and temporal adverbials (in English) was that of Cta (1963), followed soon after by Crystal's (1966) study. We will return to a discussion of these in a moment, but first it is worthwhile to look at some earlier studies on related languages.

In the analyses of Kahane & Hutter (1953), Kahane & Saporta (1953), and Kahane & Kahane (1954, 1957) on various Indo-European languages, the interesting and, at that time, daring thesis is put forward that the tense and aspect forms in the verb system are merely a redundant reflection or marking of the meaning of the temporal or aspectual adverb (which could be explicit or implicit):

...the attempt is made to establish the grammatical morphemes of verb forms as the elements which, through their relation to the other parts of the sentence, bind the whole sentence together; tense and aspect in this system are then the elements that express, in the verb, the meaning of the non-required modifier, i.e., the adverb. There are, however, two adverb patterns, one with the meaning 'date', the other with the meaning 'perfectivity' (including of course 'imperfectivity'); the hierarchic relation between these adverbs varies from system to system.

Cf. for example, Jesperøen, 1924; Poutsmas, 1926. One may also note the observations made by the Port Royal grammarians (Lancelot & Arnauld, 1743: 103): "...in most vulgar languages there are two sorts of preterits or past tenses; one, which marks the thing to be precisely done, and is therefore called definite, as I have written, I have said, I have done, I have dined; and the other which signifies it done indeterminately, and is for that reason called indefinite or aorist; as I wrote, I went, I dined &c. which is properly said only of a time, that has at least the distance of a day from that, in which we speak. This is particularly true in French; for they say, J'écrit hier, I wrote yesterday, but not J'écrit ce matin, nor J'écrit cette nuit, but J'ai écrit ce matin, J'ai écrit cette nuit, &c."
caractère temporal de passé a besoin d'être renforcé par
des adverbes de temps brings up the interesting question
of what determines what. To Seiler the adverb is redundant;
to us, the verbal ending. This is more than a subjective
preference. Since it can be shown that in all other
instances the verbal endings are only the reflex of—or are
determined by—some other element of the sentence, it may be
assumed that the tense morphemes are no exception: they
reflect the meaning of the (expressed or unexpressed) adverb.
The semantic interpretation of adverbs is, of course, a
thorny undertaking. What needs to be done (and has not been
done, so far as we can see, for any language) is an inventory
of the various aspectual and temporal meanings of the adverbs;
it would contribute considerably to an understanding of the
respective verbal system.

(Kahane & Kahane, 1954: 117-8)

Although the point of view expressed here is one which, with
slight modification, has recently been given explicit discussion and
support (cf. Gallagher, 1970; Anderson, 1972), at the time it was
formulated there were inherent difficulties attached to it. As
their analysis is confined to a more or less superficial interpreta-
tion of temporal adverbials, Kahane and Kahane are forced into the
undesirable position of having to recognize unwarranted polysemy in
many adverbs simply because they can occur with various tense or
aspect markers. That is, they encounter the methodological difficulty
of needing to make reference to the verb form "in order to establish
the exact meaning of the adverb which has determined that verb form"
(ibid.: 118). Thus, in analyzing the two Greek sentences below,
in which the same adverbial clause ('διαν θέλετε') occurs but

17.a. θα σας άκουω διαν θέλετε
   "I'll always listen to you whenever you want"

b. θα σας άκουω διαν θέλετε
   "I'll listen to you; just say when"
which differ in theaspectual form of the verb, the first being
imperfective, the second perfective, they are led to suggest that "the
two apparently identical but really different adverbs by which they
must mean adverbial clauses, contrasting in 'aspect', determine the
two aspectually contrasting verb forms 'ἀκούω' and 'ἀκούσω' "
(ibid.: 118). A comparable and equally unsatisfactory conclusion
from English would be: to say that the two adverbials 'on Monday' in
sentences 13.a.i. and 13.b.i. above are not the same adverb but
contrast with each other with respect to past and future time refer-
ence since they determine a past tense form versus a future
auxiliary, respectively. A solution to this dilemma presents itself
once a deeper level of linguistic analysis is recognized such that
temporal adverbials can be viewed as realizing most, if not all, of
underlying temporal locatives or predicates part of which however
may also be realized simultaneously (and redundantly or non-redund-
antly) as superficial tense forms. This is the approach taken by
Anderson (1972), to which we will be returning. 1

1 The adoption of a more abstract, underlying structure does not in
itself, however, prevent one from suggesting the same kind of
undesirable analysis as that of Kahane and Kahane (1954).
Macaulay (1971: 165), after contrasting the two sentences below,
claims that although the two "might appear to have the same

(34.a) John has been swimming for two hours
(35.a) John was swimming for two hours
durative adverbial for two hours, in (34.a) the time reference is
to a period of time that may not be complete, whereas in (35a)
the period of time must have ended. If the durative adverbials
are sub-classified into [+-COMPLETE] then the restriction is
that [+-DEFINITE] phase /= inclusive tense oc curs with [+-COMPLETE]
durative adverbials and [+DEFINITE] phase with [+-COMPLETE]
durative adverbials".
Klum (1959) takes a more neutral approach with respect to tense-adverbial relations (in French), regarding neither tense nor the adverbials as always redundant. Syntactically, the tense-system is seen as independent of the temporal adverbials, capable by itself of ordering the situation denoted with respect to the moment of utterance: "A ce point de vue, les dates ne sont que des compléments de temps apportant des précisions tantôt indispensables, tantôt moins nécessaires à l'intelligence de la phrase" (Klum, 1959: 30-1).

However, he recognizes that the two systems must presuppose some common semantic structure:

La langue ne tolère pas n'importe quel écart entre la signification des adverbes et celle des verbes. Il y a indubitablement un "système de correspondance sémantique" propre à la structure de chaque langue et qui constitue certains champs de force hors desquels le sujet parlant ne pourrait pas s'orienter sans peine de tomber dans l'absurdité. Ainsi peut-on constater certains groupements à l'intérieur de la catégorie des compléments de temps qui acceptent certains séries verbales tout en excluant d'autres. Inversement, certains temps verbaux sont incompatibles avec certaines structures adverbiales....

On voit d'autre part qu'une fois éliminées les combinaisons sémantiquement intolérables, le choix temporel que permet chaque complément individuel et vice versa est libre, c'est-à-dire déterminé par d'autres considérations d'ordre contextuel (aspect, concordance temporelle, etc.). Il y a ainsi des locutions temporelles qui acceptent n'importe quelle série verbale (type : la date conventionnelle représentée par l'indication de l'année, du mois, du jour, de l'heure), et il y en a d'autres (p. ex. hier, tout à l'heure, la veille) où la latitude est beaucoup moins gracieuse, c'est-à-dire où le caractère facultatif est moins prononcé.

(Klum, 1959: 31-2)

Here, and more explicitly in his later study (Klum, 1961), Klum reveals an awareness of which sub-systems of temporal adverbials are most relevant in the statement of co-occurrence restrictions with the tense system. The set of adverbs particularly crucial in
establishing the co-occurrence potential of tense forms are those tied to the "moi-ici-maintenant" axis and which express anteriority and posteriority with respect to it (e.g. 'hier'/ 'demain', 'la semaine passée'/ 'la semaine prochaine'). The parallel set of adverbials centred around a secondary deictic point of reference (e.g. 'la veille'/ 'le lendemain', 'la semaine précédente'/ 'la semaine suivante') also play a significant role. Least important, however, are those adverbials which constitute the non-deictic, cyclic, calendar and clock systems (e.g. 'lundi', 'janvier', 'à deux heures du matin', etc.--cf. §7.4.1). All of these sub-systems have in common a 'dating' function, or what we have called a locational function. Although it is adverbials with such a function which bear the closest semantic relationship with the tense system, in Klum's later study he also takes into consideration aspect and verb classes (following Bull, 1960--see below) and his exclusive consideration of dating adverbials in this widened context unfortunately lessens the number of useful syntactic and semantic correlations which he finds between verb forms (or auxiliary constructions) and the system of temporal adverbials.

We may mention, before leaving Klum's treatment of tense-adverbial relations, his approach to problem cases such as that illustrated above from Kahane and Kahane (1954). In French a comparable expression is 'tout à l'heure' which can be interpreted either as "a while back" or as "presently", depending upon the context. Such expressions are described by Vinay and Darbelnet (1958: 82) as "des mots ambivalents qui comportent une double orientation". Maintaining a more orthodox position than Kahane and
Kahane, Klum (1959: 29) states: "On sait que cette locution est compatible tant avec des séries verbales situant le procès dans une époque immédiatement passée qu'avec celles désignant un avenir immédiat. Le rôle de tout à l'heure est donc de situer un procès dans un passé ou dans un avenir immédiat. C'est là sa valeur systématique. D'où vient la possibilité d'affirmer qu'il "veut dire" soit il n'y a qu'un instant soit dans un instant? C'est uniquement par le morphème verbal employé et le contexte que l'une des deux "significations" se trouve explicitée. Tout à l'heure est identique tant du point de vue de l'intonation que de sa valeur sémantique."

Intervening between Klum's rather programmatic article of 1959 and his (1961) detailed corpus-based investigation into relations between tense and temporal adverbials is Bull's (1960) important work Time, Tense and the Verb, the results apparently of seventeen years of research and reflection. These have yielded extremely penetrating analyses of the structure of physical and linguistic time (both 'public' and 'private'), the semantic system underlying calendar and clock terms, and tense and aspectual systems (particularly with reference to Spanish). His work appears to be the first systematic study of a tense system in which distributional and semantic criteria are co-ordinated to shed light on the complex interaction of the verb with its intra-sentential context.

Bull's views, although more fully supported by an explicit theoretical framework, are essentially the same as Klum's; and Bull's framework is adopted by Klum in his subsequent study. Both the tense system and that of the calendar terms are regarded as
independent of each other but as sharing certain structural elements or properties (essentially, the ordering relationships with respect to the deictic 'axis of orientation')—hence the possibility of complementing or even duplicating each other:

The fact that public calendar intervals may be either axis- or position-bound makes it possible to "locate" an event in two ways in time. The event (or its aspects) may be merely placed between two points in a series-bound system: al llegar el domingo. In this phrase the event (which is instantaneous and cyclic) takes place within a day having a fixed position in a week. Neither domingo nor al llegar contains a vector symbol, and the day involved may be either anterior or posterior to PP. The vector may be supplied in two ways: first, by an adjective (al llegar el domingo pasado proximo) and, second, by the vector attached to the verb (llego—llegara el domingo). In the second example there is bilateral modification: domingo limits the event in time and the tense forms define the position of the time interval relative to PP.

When a calendar unit is axis-bound, it contains a vector which may perform, in just two cases, the same function as the tense vectors.... Consequently, in llego ayer and llegara maana the vector is indicated twice, once by the verb and once by the adverb.

(Bull, 1960: 50)

However, Bull claims that the tense system is structurally much more complex than the adverbial system—at least with respect to the variety of ordering relationships which can be expressed—and hence that it cannot be duplicated by the latter. For this reason he does not lay much importance on co-occurrence restrictions:

A system based on just one axis of orientation cannot be synchronized with a system containing four axes of orientation. No useful information can possibly be obtained by attempting to define the function of tense forms by classifying the forms in terms of what calendar units happen to contain the event described by each form. Nothing really new can be learned from the fact that all tenses combine with hoy, and very little information comes from the observation that all tenses but one (cantara) combine with ayer and that all but one (hubo cantado) combine with maana. This does redemonstrate, of course, that cantara, a plus vector, is incompatible with ayer, a minus vector...
vector, and that what is anterior to RP cannot be contained by a
time interval posterior to PP. The interrelationship between
the calendar system and the tense system needs to be described
in terms of systemic interaction.

(Bull, 1960: 50)

His detailed investigation in Spanish tends to be, therefore, in the
tradition of determining the various systemic and nonsystemic
functions of each tense form, taking into consideration the event
type ("cyclic" versus "noncyclic"—cf. fn. 1, p. 233) and, only to a
lesser degree, the adverbial.

We may now turn to works dealing with English. The first of
these is Ota's (1963) statistical, corpus-based study on tense and
aspect, in which he endeavours to give a semantic description of the
various tense and aspectual forms in terms of an "essential meaning"
for each and the possible reflections of this meaning as occasioned
by the context. He takes into account such contextual factors as
time and frequency adverbials, the nature of the subject of the
sentence, the lexical meaning of the verb, clause types and style.
He considers the first of these as being the most important.

Although again oriented from the point of view of tense and
although suffering somewhat from difficulties inherent in a statistical
some very important correlations—admittedly of a probabilistic rather
than of an absolute nature—between what he sees as the essential
meaning of each tense form and the elements of meaning shared by
those adverbials which characteristically co-occur with it (i.e.,
which are most highly correlated with it). Thus, for example, the
essential meaning of the non-past inclusive tense, according to Ota
(and we tend to agree with him), is that of indicating "the occurrence
of an action or the existence of a state in or for a period of time extending from some time in the past up till the moment of speaking" (Ota, 1963: 41). The adverbials which are found to characteristic- ically occur with this tense are 'since...', 'in/during/over/for the last/past...', 'all these years', 'so far', 'up to this moment', etc., all of which identify periods of time which extend from the past into the present. Again, and significantly enough, Ota found there to be no characteristic time or frequency indicators co-occurring with the progressive form, this confirming his analysis of the latter as an aspectual rather than a tense form.

Crystal, in his very comprehensive investigation into co-occurrence relations between tense forms and adverbials, rightly points out (1966: 4) that "much of English tense analysis and description has been unduly complicated by an uncertainty as to the extent of the relationship exercised by adverbials on tense-forms..., and also by an implicit half-recognition of the relevance of adverbials, which conflicts with a desire to keep the study of time-relationships within the verbal group." Crystal sets out to demonstrate that it is combinations of tense-form and adverbial specifier, not just the former, which ought to be the basis of an investigation into the expression of temporal relations and reference in English (as well as of the label used to describe these). His method involves (a) a detailed, corpus-based study of the co-occurrence possibilities of each of the six tenses ('present', 'past', 'present perfect', 'pluperfect', 'future', 'future conditional') with each of various, notionally determined classes of temporal adverbials (taking these latter as the base forms) and (b) an enumeration and informal
characterization of "the definably distinct meanings produced by the co-occurrence of each adverbial class with the six tense forms" (1966: 16).

The results of Crystal's distributional analysis showed, remarkably clearly, that most occurrences of tense forms are accompanied by an adverbial which determines or specifies its meaning, and where they are not, either it is because the context would make the adverbials redundant or because they must be absent in order that the meaning expressed is one of "timeless fact", i.e., of temporally unspecified generality. Crystal states his major thesis as follows:

The crucial point is that it is NOT the present tense on its own which is causing the change in temporal emphasis which is then given a new label, but the present tense in collaboration with, colligating with, or (to introduce a term for the occasion) being SPECIFIED by an adverbial word, phrase or clause of time, BOTH of which work together to produce a definable time-relationship which may then be referred to with a new label. It is not a question of tense-form alone giving the relevant distinguishing indication of time, as has been traditionally assumed, but of tense-form with or without adverbial specification which gives unambiguous indication. One interprets a given tense-form in a particular way either because the key to the interpretation is given in the form of an adverbial specifier or because the absence of such a key is itself equally clear as a pointer to which time is being referred to.

(Crystal, 1966: 5)

However, despite the attractiveness and soundness of Crystal's conclusions in the above quotation, one is left rather unhappy in certain respects when looking at the actual details of his analysis. First of all, his notional classification of temporal adverbials, although guided by some formal properties and generally sound intuitions, suffers inherently from its a priori nature. On the one hand, many classes are irrelevant to the task at hand—for example,
the purely durational adverbials and the various sub-classes of frequency adverbials—and hence we find an unnecessary proliferation of tense-adverbial meanings in which the contributions of tense and adverb are simply additive (e.g. 'past descriptive'/'past descriptive, duration specified'/'past descriptive, frequency specified').

(Recall that Kahane, Klum and Bull all restricted their attention to locational adverbials.) On the other hand, some of Crystal's classes subsume disparate sub-classes which have different co-occurrence potentials. The most striking case here is that of the class of adverbials labelled 'restricted duration' and including both adverbials identifying periods not or not necessarily including the time of utterance (e.g. 'for two hours', 'from noon to midnight', 'all of yesterday') and those which do (e.g. 'for the past two hours', 'since noon', 'all day'). The distributional analysis therefore leads to the unfortunate conclusion that this class of adverbials co-occurs indiscriminately with both the non-inclusive past tense and the (past and non-past) inclusive tenses (cf. Crystal, 1966: 20) whereas Ota's study revealed that it was the second sub-class of adverbials which characteristically co-occurred with the inclusive tenses.

Secondly, Crystal has concentrated solely on the adverbial context of the various tenses, to the exclusion of other contextual factors. And this is, of course, legitimate given the aims and scope of his study. However, in his enumeration of all possible tense-adverbial meanings, these neglected factors surreptitiously slip in; and Crystal is led to distinguish meanings which have nothing to do with either the tense or the adverbial. For example,
amongst the meanings of past tense combinations, he distinguishes 'non-continuous' action in the past versus 'continuous' action in the past, both of which involve the same set of optional adverbial specifiers. His distinction, whatever its semantic properties, correlates (as in his own examples) entirely with the absence versus the presence of the progressive form, i.e. an aspectual element. Similarly, under non-past tense combinations he distinguishes between 'perceivable activity taking place' and 'non-perceivable activity, contemporaneous removed'. But again, both groups take exactly the same set of (optional) temporal specifiers, and it is not at all clear what has motivated the distinction or the particular grouping of examples. What appears to be at work is a complex interplay of such factors as the lexical properties of the verb, presence versus absence of progressive aspect and first-person versus second and third-person subjects—but it is still difficult to see the difference (as labelled by Crystal) between such of his examples as the pairs of sentences below, the a. sentences belonging to 'perceivable activity taking place' and the b. sentences to 'non-perceivable activity, contemporaneous removed':

18.a. I find that hard to believe  
b. John thinks so, you know
19.a. The cup contains sugar  
b. George is ill
20.a. Oxford are rowing well  
b. Mary's having her lesson

The role of the semantic properties of the verb is even more prominent
in the class of non-past tense meanings (with optional temporal specification) which Crystal labels 'specific non-perceivable activity, in recent past'. All of his examples contain verbs such as 'say'/'tell'/'ask' (e.g. 'John says that...'), but these constitute a very restricted semantic class of verbs with rather special properties, including their special interpretation when used with the non-past tense (this being roughly the same as that of the non-past inclusive form—'John has said that...'). Further examples could be given, but these should suffice to illustrate the problem at hand. Although one does not expect Crystal to have accounted for all these other contextual properties, his classification would be somewhat less dubious (and superficially less arbitrary) had he given some explicit recognition to the interplay of these elements—or else had avoided altogether making such distinctions as those just exemplified in his enumeration of tense-adverbial meanings.

Anderson's (1972) treatment of tense (and the one which will be adopted here) has features reminiscent of Kahane and Kahane's proposal to treat tense marking as a redundant reflection of a temporal adverbial; but, with the added power of a more abstract level of representation, Anderson is able to overcome the difficulties facing such a proposal as well as to accommodate systematically the co-occurrence restrictions between the two superficial categories and their individual contribution in the expression of various temporal relationships as discussed in the studies of Klum, Bull, Ota and Crystal. Roughly speaking, Anderson regards tense forms as
instances of temporal concord. What is meant by this and how he proposes to account for the difficult cases (i.e., where there is no adverbial in the surface structure or where the adverbial is deictically ambivalent) is made clear in the following passages:

What is universal is the existence of temporal adverbs which mark various semantic distinctions correlating with time reference, particularly with respect to some public calendar scale or in relation to the moment of locution. Accordingly, in those languages which show tense in the verb this is merely a reflexion of concord with an appropriately specified adverb, which may be deleted in certain circumstances.

(Ander son, 1972: 193)

Now there are sentences containing a past tense in which an appropriate adverbial is lacking superficially. These occur typically when the temporal axis in the past has already been established: such sentences show anaphoric tense marking. I shall assume that they contain an anaphoric temporal adverb ('at that time' or the like) which is deleted after having been copied onto the V. These merely represent then an instance of anaphora by deletion. The time reference is recoverable from the context; the inflexion on the verb merely confirms that this has not changed. The adverb is alternatively deleteable if it is unspecified ('at a certain past time'); it

\[=\text{complex segment formation}\]

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1 In this connection we may also note Kiparsky's (1968) arguments for analyzing tense and mood in early Indo-European as adverbial constituents in the deep structure. These, he claims, could be realized either inflectionally or as adverbials, but not both. That is, tense forms were originally in complementary distribution with certain related classes of adverbs. This situation contrasts with that of modern Indo-European languages in which the two kinds of realizations of the underlying adverbial may co-occur.

is a PRO-form. In both such cases, the temporal adverbial can be deleted because no non-recoverable semantic information is thereby eliminated.

( ibid.: 196 )

...even though the various calendar adverbials do not in themselves spell out whether they are [+past] or [-past], I take it that such a specification is associated with them in semantic representations. The alternative once again is to relate the distinction to V. We would then have to allow for such temporal reference to range over two different kinds of element at the semantic level. It seems preferable to suggest (particularly in view of the non-universality of verbal tense) that this, like other types of deixis, is associated uniquely with N.

( ibid.: 197-8 )

Summarizing then, superficial tense is analyzed as the grammatical realization through copying, of that portion of the semantic temporal specification for the entire sentence (occurring as a temporal locative in the underlying representation) pertaining to the temporal location of the ordering relation between the situation being expressed and the time of utterance (or some previously specified reference point). The above account of the mapping process is, of course, somewhat over-simplified. However, the principle is clear enough and can be extended to the analysis of the inclusive form whose semantic ...
correlate is considerably more complex than that of the simple

tense forms, involving both a period-time specification and an
indefinite (existential) point time locative—cf. §8.2 for more
detailed discussion.

5.2.3 The progressive form

The literature on the meaning(s) of the progressive form is quite
overwhelming, and we will not attempt a review here (cf. Allen,
1966 and references therein; Ota, 1963; Allan, 1970; Macaulay,
1971; and Anderson, 1975c). The analysis we will eventually
adopt will be in line with Anderson, 1973c, one which centres on an
interpretation of the progressive form as realizing a predication
of the existence of the described situation at a point in time (cf.
also Joos' (1953) notion of 'validity of the predication', Ota's
(1963) notion of 'process').¹ For now we want merely to note and
illustrate the relationship between what we will call progressive
aspect and the occurrence of temporal adverbials.

Ota, it will be recalled, found there to be no temporal
adverbials that typically co-occur with progressive forms; and this
leads him to the conclusion that 'what characterizes progressives

¹ We shall not be concerned to any great extent with the use of the
progressive to indicate future (scheduled) activity, to indicate
temporary, recurrent activity, and to indicate sporadic, dis-
approved of activity. All of these—illustrated in 1. to 3.—
require characteristic temporal adverbials unless the time

1. The meeting is being held next week
2. John is doing the cooking this week
3. Mary is forever changing her hair style

reference is clear from the context. Cf. Ota, 1963; Palmer,
1965; Allen, 1966; and Macaulay, 1971 for some discussion.
over against simple forms is not time" (Ota, 1963: 65). (Crystal (1966: 15) also suggests that, with respect to co-occurrence with adverbials, "the distinction between simple and progressive aspect may also, on the whole, be ignored"). However, Ota does observe later on, in connection with the inclusive tense, that there are some differences in the co-occurrence potential of such adverbials as 'for two days', 'all day', etc. depending on whether the verb is in the progressive form or not. The same discrepancy does not appear in the case of adverbials such as 'during the past two days', 'over the weekend':

24.a. Someone has repaired the light-switch

\[ \begin{align*}
&\text{during the past two hours} \\
&\#\text{for the past two hours}
\end{align*} \]

b. Someone has been repairing the light-switch

\[ \begin{align*}
&\text{during the past two hours} \\
&\text{for the past two hours}
\end{align*} \]

(The starred sentence in 24.a. may be interpreted iteratively but only somewhat unnaturally.) However, Ota discerned that it is only with certain verbs that this restriction holds, namely with those verbs "which contain an inherent idea of "goal" or completion" (1963: 98). These he calls 'conclusives', following Jespersen (1924)—cf. §6.3.3. 'Non-conclusive' verbs do not display the same pattern as exemplified in 24.a.

25.a. Fred has worked in London \[ \begin{align*}
&\text{during the past two years} \\
&\text{for the past two years}
\end{align*} \]

b. John has been working in London

\[ \begin{align*}
&\text{during the past two years} \\
&\text{for the past two years}
\end{align*} \]

We may generalize Ota's findings, for the same principle is at
work in the case of the non-inclusive tense as well:

26.a. John repaired the light-switch during his coffee-break for two hours

b. John was repairing the light switch during his coffee break for two hours

27.a. John worked in London during the summer for two months

b. John was working in London during the summer for two months

Furthermore, we may note that the distributional pattern is exactly complementary to that above when the temporal adverbial is one such as 'in so much time', which indicates not the length of time the described situation is in existence (i.e. how long it lasts) but rather the length of time between its beginning and its finishing, the reaching of its 'conclusion' (i.e. how long it takes). This is what we intend by the term 'expending' with respect to the semantic function of such adverbials (cf. § 5.2). In such contexts, only the non-progressive form of a conclusive verb is acceptable (but cf. fn. 1, p.229):

28.a. John repaired the light-switch in five minutes

b. John was repairing the light-switch in five minutes

Crystal remarks in passing (1966: 15) that "with certain co-occurrences there is a definite tendency for one or the other [simple or progressive aspect] to be used," and "there are verb classes which have a certain time-relationship 'built-in', which in the context of adverbial specification forces co-occurrence with progressive rather than simple, or vice versa". However, he does not elaborate other than to give the following examples:

1.a. I was cutting the lawn all morning

b. I cut the lawn all morning

2.a. I was travelling to London all day

b. I travelled to London all day
29.a. *John worked in London in two years  
   b. *John was working in London in two years

Another difference in pattern, within the conclusive verbs, is that illustrated in 30. and 31. below.

30.a. John was repairing the light-switch at that moment  
   b. John was repairing the light-switch for two hours
31.a. John was reaching the finish line at that moment  
   b. *John was reaching the finish line for two hours

Finally, we may note the following co-occurrence restriction between non-progressive aspect and the aspectual adverbs:

32.a. Mary was already/still eating dinner  
   b. *Mary already/still ate dinner ('still' ≠ 'nevertheless')
33.a. Mary wasn't eating dinner yet/anymore  
   b. *Mary didn't eat dinner yet/anymore (non-repetitive interpretation)

5.2.4 Negation

Negation affects the co-occurrence potential of durative adverbials: sentences which cannot take such adverbials when 'positive' can usually do so when negated:

34.a. *John sold a car for two weeks  
   b. John didn't sell a car for two weeks

1 Such sentences as 32.b. and 33.b. are perhaps less objectionable if understood as reported speech—e.g. The doctor explained that....
35. a. Fred arrived until Monday
    b. Fred didn’t arrive until Monday

Furthermore, when negated, those sentences which are interpreted iteratively are ambiguous between an interpretation in which the scope of the negation is the entire sentence (and hence the negated sentence could be used to deny the non-negated one) and an interpretation in which its scope does not include the durative adverbial: ¹

36. a. John wrote to Mary until she got married
    b. John didn’t write to Mary until she got married

37. a. The boys punched each other for several minutes
    b. The boys didn’t punch each other for several minutes

The same is true of the following sentences in which the interpretation of the non-negated sentence is not one of iteration but rather the duration of the state resulting from the described action:

38. a. I’ll lend you the book until tomorrow morning
    b. I won’t lend you the book until tomorrow morning

39. a. The lake froze over for two months
    b. The lake didn’t freeze over for two months

Related to this phenomenon is the equivalence in interpretation of the

¹ Sandhagen (1956: 179) observes: “Used in negative sentences with the verb referring to the past time-sphere, for indicates, not the actual length of time occupied by such and such activity or state of things (in the present chapter, I have not been there for three years is not a way to deny the statement I have been there for three years, for then the aspects outlined in Ch. I would be applicable to both sentences), but the non-occurrence of such and such an activity or state of things within the limits of the space of time designated by the head-word, the earlier limit generally indicating, impliedly, the time of the last occurrence or of the actual existence of the action or event in question.” We may note, however, that if the adverb is preposed, only this latter interpretation is possible.
following sentences which differ in the presence of 'for' versus 'in':

40. a. Mary hasn't had any sleep for ten days
   b. Mary hasn't had any sleep in ten days

41. a. I was crying in my sleep, something I hadn't done for years
   b. I was crying in my sleep, something I hadn't done in years

The same equivalence holds in the case of some comparative and superlative constructions:

1. Things were suddenly running much more smoothly than they had been \(\text{[in]}\) the past few weeks
2. It was the first time \(\text{[in]}\) months that I'd seen him smile

Such parallel equivalences in negative and comparative superlative contexts may be interpreted as lending support to an adversative analysis of the comparative construction (cf. Barnes, 1924; Ross, 1968; Seuren, 1973; also cf. §4.2). Indeed, Sandhagen (1956: 180) makes the astute observation, with respect to the following sentences:

3. As for the men, they're well fed \(\text{[for]}\) days they feel secure
4. That made him think of the cigarette; he would step out into the launch, gratefully lighting the first cigarette for ten hours

that "the superlative word that precedes the prepositional phrase implies both negation and the perfect or the pluperfect. Thus in the first example the meaning they have not felt secure \(\text{[for]}\) days is implied, and in the second he had not lighted a cigarette \(\text{[for]}\) ten hours".

The relationship is perhaps clearer in the case of superlatives not involving temporal order, as in 5. below.

5. It is the poorest crop we have had for ten years
6. We have not had such a poor crop for ten years
Another set of facts involving negation is the requirement for some temporal adverbials that they occur in a negative context. This is, in general, the case with 'yet' and 'anymore' (or 'any longer'), as the following sentences illustrate:

42. a. *John was sleeping yet
    b. John wasn’t sleeping yet
43. a. *Bill is here anymore
    b. Bill isn’t here anymore

That these sentences appear to be the negated counterparts of the sentences in 44. and 45. has led to the suggestion that 'already'/'yet' 44. John was already sleeping
45. Bill is still here

and 'still'/'anymore' constitute suppletive sets. That is, 'yet' is analysed as the suppletive alternant of 'already' when in a negative context, just as the structuralists would describe 'bear' as the suppletive alternant of 'good' when in a comparative construction (cf. Bloomfield, 1933). The relationship of these adverbs to each other will be investigated more fully in Chapter 8.

Finally, we may note that negation interacts with the series of temporal adverbs 'sometimes'/'ever'/'never'/'always'/'often'/'seldom' in a manner parallel to its interaction with the series of number quantifier expressions 'some'/'any'/'no(ne)''all'/'many'/'few'. In particular, we may compare the following sets of equivalences (cf. Anderson & Jessen, 1973):

1 The application of the notion of suppletion has been considerably extended in Anderson (1971b) to cover such pairs of verbs as 'agree'/'accept', 'die'/'kill', 'learn'/'teach'.
46.a. i. Some of the students don't like the teacher
    ii. Not all of the students like the teacher
b. i. He sometimes doesn't visit his mother on Tuesday
    ii. He doesn't always visit his mother on Tuesday
47.a. i. John doesn't like any of his students
    ii. John likes none of his students
b. i. He doesn't ever visit his mother
    ii. He never visits his mother
48.a. i. There aren't any of the students who don't like him
    ii. All the students like him
b. i. He doesn't ever not visit his mother on Tuesday
    ii. He always visits his mother on Tuesday

We shall find that quantification of '(number of) times' plays a very important role in the semantics of temporal adverbials, not only in the case of these manifestly quantificational adverbs, but also in the analysis of the other adverbials which have concerned us in this section—'in' and 'for' phrases and the aspectual adverbs. However, we will find that the analysis of quantification in natural language can be based upon independently motivated existential locative predications (cf. §4.2) and partitive constructions. That is, there is no need to incorporate wholesale into the semantic structure of English the existential and universal quantifiers of symbolic logic.

5.2.5 Spatial adverbials

Spatial locatives and directionals may combine freely with temporal adverbials, both locational and directional—cf. 49. and 50.
The children were playing in the garden
at noon
during the afternoon
all morning

The balloon floated upwards
when the string was cut
for several minutes

However, co-occurrence restrictions or marked interpretations appear
in the case of temporal durational adverbials and spatial expressions
involving either a sequence 'from...to...' (explicitly or implicitly—
cf. 'across' and, allowing for incorporation, 'cross'/'traverse') or
a measure phrase (e.g. 'for two miles'). We have yet to invest-
igate the semantic structure of such expressions—this will be done
in Chapter 7—but we may take note of the following facts here.
Sentences 51. and 52. below demonstrate that each type of adverbial
may occur—by itself—in the same intra-sentential context. However,

51. John swam
    for two hours
    from noon to dinner time

52. John swam
    (for) two miles
    from one side of the lake to the other
    across the lake

when the two co-occur, as in 53., the resulting sentence is either

53a. John swam
    (for) two miles
    from one side of the lake to the other
    across the lake

    for two hours
    from noon to dinner time

b. John crossed the lake (for two hours
                           from noon to dinner time
                           traversed)
Pragmatic considerations are crucial here. If it is feasible to traverse the distance indicated in the length of time indicated by the type of locomotion indicated, then an iterative interpretation is possible. Thus, 1. could be interpreted as 2. and 3. as 4. However, if it is not normally feasible to do this,

1. Fred swam across the river all afternoon
2. Fred swam back and forth across the river all afternoon
3. Lindbergh flew across North America for six months
4. Lindbergh flew back and forth across North America for six months

then the iterative interpretation is rejected and the sentence is unacceptable—as in 5. and 6.

5. *Fred swam across the Channel for two hours
6. *Lindbergh flew across North America for two hours

However, for some speakers, there appears to be a certain ambivalence with respect to 'across' (but not 'from...to...') or 'cross'/'traverse') in that with some verbs of locomotion sentences like 5. and 6. are acceptable—cf. 7. to 9. Although we have not been able to investigate how systematic or dialectally uniform this phenomenon is, it would tend to suggest that in such cases 'across' is interpreted as "from one side towards the other" rather than "from one side of... to the other" (cf. 'along': "from one end of... towards the other"). Furthermore, the same appears to hold for 'through'—cf. 10. and 11. Anticipating still more, this same phenomenon may underlie the possibility of both a conclusive and non-conclusive interpretation of 'read (something)'.

10. We walked through the forest for an hour
11. We drove through the Alps in two hours (and then cut south)
12. Max read the newspaper in two hours—War and Peace for two hours
swam repeatedly from one side of the lake to the other throughout
the period of time indicated. If, on the other hand, the durational
adverbial is replaced by an expending adverbial, as in 54., the

\[ \text{John swam} \begin{cases} \text{for two miles} \\ \text{from one side of the lake to the other} \\ \text{across the lake} \end{cases} \]

in half an hour

\[ \text{John} \begin{cases} \text{crossed} \\ \text{traversed} \end{cases} \text{the lake in half an hour} \]

sentence is once again well-formed with a single-occurrence reading.
This pattern is reminiscent of that discussed above in §5.2.3 where
it was observed that conclusive verbs in the non-progressive form
can co-occur with expending adverbials but not with durational ones.
Conclusive verbs, it will be recalled were characterized semantically
as incorporating some notion of 'goal'. Here we find that a complex
of a non-conclusive verb plus a spatial adverbial ('from...to...')
expressing explicitly a destination or goal displays the same pattern
of co-occurrence and interpretation regarding durational and expending
adverbials as does a conclusive verb. This observation will assume
more significance in the following chapters.

5.2.6. **Noun phrases**

Focussing now on noun phrases in the sentence other than noun
phrases functioning as the object of a temporal preposition, we find
that properties of the subject, direct object and even indirect
object noun phrases affect the co-occurrence and interpretation of
temporal adverbials. Again, the facts centre on the durational and
the expending adverbials. The factors involved—mainly to do with
referential properties of the noun phrase—appear to include the
distinctions 'singular'/plural', 'count'/mass', 'quantified'/
'unquantified', 'definite'/ 'indefinite', 'specific'/ 'non-specific', as illustrated below.

55. a. Gas seeped into the pit \{for several minutes

b. Enough gas to kill a person seeped into the pit \{for several minutes

   \{in several minutes

   \{in several minutes

c. A messenger reached the front line \{for several hours

   \{in a few hours

d. Reinforcements reached the front line \{for several hours

   \{in several hours

e. The reinforcements reached the front line

\{for several hours

\{in two hours

56. a. John wrote \{an essay

   \{the essay

   \{some excellent essays

   \{some excellent poetry

   \{some (non-specific) essays

   \{some (non-specific) poetry

\{for two days

\{in less than a day

\{all week

\{in less than a day

57. a. Mary taught the poem to \{a \{friend

   \{her

   \{in half an hour

   \{for half an hour

b. Mary taught the poem to \{friends

   \{anyone interested

   \{all day

   \{in half an hour

5.2.7 'Begin', 'continue', 'stop', etc.

The periphrastic verbs 'begin'/ 'start'/ 'commence', 'continue'/ 'keep'/ 'go on', 'stop'/ 'end'/ 'cease'/ 'terminate' and 'finish'/ 'complete', often called 'aspectual' (auxiliary) verbs can be viewed as having some
affect on the co-occurrence and interpretation of temporal adverbials—as in the following examples. This should not be surprising since

Sentence 56.a., if acceptable, would either suggest that John has very exceptional abilities or imply that he began writing the essay at 1:00, in which case it would be interpreted as the first variant of 56.b., just as 1.a. below is acceptable and interpreted as 1.b.:  

1. a. The couple ate dinner at 6:00  
   b. The couple began eating dinner at 6:00  

However, not only do the sentences without 'begin' carry the additional implication that the essay and dinner were finished, but also there appear to be pragmatic constraints on the possibility of interpreting them as indicating the time of the inception of the situation; the situation involved must be one known or believed to be of considerably short duration. Hence 2.a. is much less acceptable and would hardly be used in the interpretation of 2.b., whereas 3.a. is much better than 56.a.

2. a. John wrote his Ph.D. thesis at 1:00  
   b. John began writing his Ph.D. thesis at 1:00  

3. a. John wrote the letter at 1:00  
   b. John began writing the letter at 1:00  

Sentence 57.b. is acceptable under the interpretation that it is the inception of a habitual activity or, at least, one which is to be repeated in the future which is being expressed—cf. 4.

4. John began to rest until noon (every day) after he was told he had a heart condition  

Sentence 58.b., with 'continue' or 'go on' rather than 'keep' is acceptable on a "resume" interpretation, but not on a "not-stop" one. 'Keep' does not have this dual interpretation. One may compare, in this respect, the two interpretations of 'remember', one being "call back into the memory", the other "keep in one's memory"—cf. 5, and 6.

5. I remembered his name just in time  
6. I have remembered his advice all these years  

For 58.b. to be acceptable on a "not-stop" interpretation, the point-time adverbial must be made implicit, as in 7. below.

7. Although he should have gone indoors at that moment, Max kept/went on watering the flowers in the garden
56.a. ?John wrote the essay at 1:00
   b. John began writing the essay at 1:00

57.a. John rested until noon
   b. John began resting until noon

58.a. Max was watering the flowers at that moment
   b. Max continued watering the flowers at that moment

these verbs lexicalize semantic structures corresponding to different phases of the situation which would be described by the sentence if they were not present, and it can be expected that different phases of a situation will have different temporal properties.

5.2.8 Verb classes

The distributional patterns of durational adverbials and expanding adverbials has led us to distinguish two classes of verbs—conclusives and non-conclusives. However, we must distinguish a third class of verbs which do not participate in the conclusive/non-conclusive distinction—namely state verbs (Ota (1963) regarded

As the distinction between stative verbs and state verbs will come up several times in the following chapter, we should at this point make it clear that when we talk of state verbs (or, more generally, predicates) we have in mind verbs (or predicate adjectives/nouns) which participate in the describing of states rather than actions. By stative predicates we will be referring to those predicates which, according to the criteria set forth by Lakoff (1965, 1966), are analyzable as containing the (syntactic) feature +STATIV. His criteria include co-occurrence with progressive aspect (e.g. John is knowing the answer), clefting with 'do' (e.g. What John does is know the answer), occurring in 'true imperatives' (e.g. Know the answer!), and several others. As Lakoff noted himself, this feature only partially corresponds to the semantic element of "state". Furthermore, it has been found virtually impossible to account for the rejection of progressive aspect by a verb simply by means of such a feature. As Lyons (1968: 316) notes "all the 'non-progressive' verbs can in fact take the progressive aspect under particular circumstances" (cf. too Haas, 1973: 88).
the conclusive/non-conclusive distinction as applicable only to actional verbs.) Although these display the same pattern of co-occurrence with durational and expending adverbials as do non-conclusive verbs—cf. 59, and 60—they are not subject to the

1 This is not quite accurate: if an expending adverbial co-occurs with a stative verb, the sentence is usually interpretable in an inceptive reading whereas this is much less likely with a non-conclusive verb. Thus, 59.b. and 60.b. are both acceptable if interpreted inceptively whereas 1. and 2. below are much less so:

1. Fred rode his bicycle in two hours
2. The ball rolled along the pavement in five minutes

(Given that a past-time secondary point of reference is firmly established contextually it is possible to interpret these (e.g. "two hours later") in a fashion parallel to the corresponding sentences with 'will' rather than the past tense (e.g. "two hours from now").) Compare also the difference in acceptability between 3. and 4.:

3. Fred slept in five minutes
4. Fred was asleep in five minutes

Progressive aspect renders 3. equally as acceptable as 4.:

5. Fred was sleeping in five minutes

Similar observations hold for the following triple:

6. Mary worked in five minutes
7. Mary was at work in five minutes
8. Mary was working in five minutes

The inceptive interpretation is felt more strongly when 'within' is substituted for 'in'. 'Within so much time' is also an expending adverbial, and 'within' is related to 'in' in much the same way as 'by' is related to 'at': 'within two hours' = 'in an amount of time not greater than (i.e. less than or equal to) two hours'; 'by 10:00' = 'at a time not later than (i.e. earlier than or simultaneous with) 10:00' (e.g. 8-7). In this light, consider the equivalence of the following pairs of sentences if the time of utterance is 8:00.

9.a. John will be here at 10:00
   b. John will be here in two hours
10.a. John will be here by 10:00
      b. John will be here within two hours
59.a. John was ill for several months
b. *John was ill in several months
60.a. Fred hated his teacher all year
b. *Fred hated his teacher in a year

interaction with spatial adverbials or with referential properties of co-occurring noun phrases which we illustrated in § 5.2.5. and § 5.2.7. We may compare 53. with 61. and 62. below and 56.a. with 63. (keeping in mind the reservations expressed in fn. 1 p. 299 concerning the possibility of an incomplete interpretation).

61. The fog {stretched} {from London to Brighton} for several days {extended} {across the country} in several days

62. The highway was under two feet of snow for sixty miles
   {from Christmas to New Year
   until February
   in several days

63. Fred disliked {a particular girl in his class}
    {his teacher
    in year
    in five months

However, we may note here, for future reference, that there are non-state non-conclusive verbs for which the co-occurrence of temporal adverbials is also unaffected by the referential properties of the noun phrases, in particular those of the direct object—cf. again 56.a. with the sentences below.

64. Frodo flew his kite {all afternoon
    min an hour

65. Paul pulled the toboggan {for ten minutes
    min ten minutes

66. Any followed the man {for only half an hour
    min only half an hour

67. Willy played his guitar {for half an hour
    min half an hour
We may now consider what bearing the syntactico-semantic distinction between transitive and intransitive verbs has on the co-occurrence potential of these same adverbials. An interesting class of verbs in this connection are the so-called pseudo-intransitive verbs such as 'eat', 'sew', 'dig', 'shoot'—i.e. (non-ergative) verbs which can occur either with or without a (superficial) direct object. These verbs display the distributional pattern with respect to durational and expending temporal adverbials of non-conclusives when used intransitively (i.e. with their underlying object unspecified or deleted) and that of conclusives when used with a manifest direct object having the necessary referential properties. This is illustrated in examples 68. and 69.

If the intransitive

68. a. Peter drank \( \text{all evening} \) \( \text{in two minutes} \)
   b. Peter drank beer \( \text{all evening} \) \( \text{in two minutes} \)
   c. Peter drank a pint of beer \( \text{all evening} \) \( \text{in two minutes} \)

69. a. Katy knitted \( \text{for several hours} \) \( \text{in several hours} \)
   b. Mary knitted doll's clothes \( \text{all evening} \) \( \text{in several hours} \)
   c. Mary knitted a pair of mittens \( \text{for two hours} \) \( \text{in two hours} \)

Usage involves, in underlying structure, a non-specified object, this would account for its non-conclusive properties.

When we consider verbs which are fully or invariably transitive or fully intransitive, we find that the distinction has no necessary correlation with their patterning as conclusive or non-conclusive verbs. For as we have seen (cf. 64. to 67.), there are transitive
verbs which appear always to accept durative adverbials while
rejecting expending adverbials and others which display the reverse
pattern—as in 70. and 71. Similarly, there are intransitive verbs

70. We crossed the Channel \( \text{in half an hour} \)
\( \text{for half an hour} \)

71. The ambulance reached the hospital \( \text{in ten minutes} \)
\( \text{for ten minutes} \)

which pattern as conclusives—as in 72. and 73.—and others which
pattern as non-conclusives—as in 74. and 75.

72. John died \( \text{for a few minutes} \)
\( \text{in a few minutes} \)

73. The letter arrived \( \text{for two days} \)
\( \text{in two days} \)

74. The baby cried \( \text{all through the night} \)
\( \text{in five hours} \)

75. The women chatted and gossiped \( \text{all afternoon} \)
\( \text{in three hours} \)

Finally, we may note again that the interpretation of some
adverbials—notably 'for' and 'until' phrases—is affected by the
lexical properties of the verb with which they co-occur. We have already observed in the section on negation (§ 5.2.4.) that these durative adverbials can express the measure of the temporal extension.

The importance of the lexical properties of the verb to the semantic function of a temporal expression was put forward most succinctly and convincingly by Bull (1960: 45): "What una hora actually measures in dormir una hora, girar una hora, and levantarse una hora is quite clear. In dormir una hora, the adverb measures the actual duration (the entire length) of the event expressed by the stem of dormir. In girar una hora, the adverb does not measure a single event; it measures the final event in the same series. If, however, the series is conceptualized as a single event, then una hora measures its length. In levantarse una hora, the adverb does not measure the duration of the event. It actually measures the time between two events, that is, between levantarse and acostarse ("to go to bed"). A person who gets up for an hour stays out of bed for an hour. In this sense, then, it is improper to say that una hora "modifies" levantarse. Events, such as getting up and rotating, whose termination is their distinguishing attribute—they can be interrupted but not prolonged past their natural termination—are called 'cyclic' by Bull, whereas those, like sleeping, which do not have this element of 'automatic termination' but rather whose attributes are all present at its inception are called 'non-cyclic'. Bull makes a further distinction within the cyclic events between those like rotating which are continuously repeatable and those like getting up which are not, in that an event of a different nature must intervene between repetitions. However, Bull emphasizes that these categories apply to events and not to the verbs which 'label' them: "The map is not the land it represents. There are, consequently, no cyclic and noncyclic verbs. Many stems may label both cyclic and noncyclic events. The act of eating (comer), for example, is noncyclic and comer manzanas is likewise noncyclic. However, comer una manzana is cyclic; the action comes to an end because there is an end to the apple" (Bull, 1960: 46). Bull's remarks here are very relevant to the present and following discussion. It is only unfortunate that he accepted such a simplistic relation between situations (events) and their linguistic encoding—it is certainly more complex than labelling by a verb.
of a single instance of the described situation, the total duration of successive repetitions of a situation, or the duration of the situation, which, in effect, results from the described situation. Which of these interpretations is selected appears to depend on the choice of verb:

76. John worked in London \{ for five years until he got married

77. The boys punched each other \{ for several minutes until their mothers came

78. The lake froze over \{ for two months until April

79. a. John flew to New York for the weekend
    b. John telephoned to New York for the afternoon
    c. John cabled to New York for the afternoon
VI
ASPECT AND PROPOSITION TYPES

6.1 Introductory remarks

At first glance, the observations made in § 5.2.3 through § 5.2.8 in the preceding chapter appear unrelated to each other; and, in some cases, it is difficult to discern any intrinsic connection between the contextual element involved (e.g., spatial adverbials, types of noun phrases) and the co-occurrence or interpretation of temporal adverbials. However, all these contextual factors take on much more significance once we shift our focus of attention somewhat. These features—verb class, negation, aspect, properties of noun phrases, spatial adverbials—all contribute to the description of different kinds of linguistically relevant situations, and it is in terms of the corresponding proposition types.

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1 As the entire sentence, inclusive of temporal adverbials, corresponds to a temporally specified proposition, we may consider the proposition with respect to which temporal specification is 'added' as one containing one or more unbound 'time' variables in addition to the propositional nucleus, this latter being the complex of non-temporal terms—names and predicates/relations—characterizing a situation in its most skeletal form. (Cf. Anderson's 1972: 24) characterization of a 'basic proposition' as "a tenseless, moodless, voiceless representation of an event/state/relation and its participants".) A basic or nuclear proposition plus its temporal variables will be called a 'temporally-structured proposition' and such propositions differing in their internal temporal structure will be instances of different (temporally-structured) proposition types. Temporal specification involves either binding the unbound variables or replacing them with temporal constants. Only under certain conditions, which we need not go into here, may temporally unspecified propositions comprise the entire semantic content of a sentence or part of a sentence (cf. Chafe, 1970; Macaulay, 1971; and Anderson, 1973d on 'generic' sentences).
that the co-occurrence and interpretation potential of temporal adverbials are statable and accountable for.

Once put into these terms, we see that we are into the realm of 'aspectology', broadly conceived. This last proviso is necessary since the term 'aspect', in its traditional (i.e. as originating with the 19th century Slavicists—cf. below) and narrow interpretation, has been used to refer to a grammatical category, specifically a category of the verb. What has emerged in the past one hundred years, and most forcibly in the last two decades, is that the traditional view must be abandoned or, at least, reinterpreted. In this study it is maintained that aspect, in its most general conception, is the linguistic reflex of the existential status or structure (cf. § 6.4) of the situation characterized by the basic proposition (and thus is more a feature of sentential units than a feature solely of the verb) and may have lexical, grammatical or syntagmatic realization.¹

Macaulay (1971) and Verkuyl (1972), in particular, have investigated from a syntactic point of view how some of the contextual features surveyed above interact to define different aspeclual configurations at the sentence level. However, they were not the first to notice the complex and contextually-dependent nature of

¹ However, within this broad interpretation of the term aspect, intended to cover the full range of phenomena which has been discussed under that name, we will find it necessary to distinguish three sub-categories: aspect (in a restricted sense), aktionsart, and proposition type (or 'zeitcharakter')—cf. § 6.4.)
aspectual categories nor were linguists, in general, the first to concern themselves with the temporal properties of different types of situations (or the relationship between tense/temporal modification and different classes of verbs), for philosophers have also been interested in such problems. Thus, before motivating a localistic, semantic characterization of aspect/aktionsarten (= predications of existential location or movement) and proposition types (= the logico-linguistic correlates of situation types), we will review briefly the approaches to this area of investigation—both philosophic and linguistic—which have contributed directly or indirectly to this recent trend in the conception and analysis of aspect or which, at least, support it.

6.2 The philosophical tradition

6.2.1 General remarks

Although it must be borne in mind that the ultimate aims of the philosophers or the logicians who base their investigations upon the structure and functioning of natural (or artificial) languages are often quite different from those of the linguist, it is nevertheless the case that, especially in the realm of semantic analysis, the two disciplines often find themselves grappling with the same or similar problems. Until recently, however, they have been more or less unaware of each other's results and/or difficulties. This is no less true for the problem of aspect (or verb classes or

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1 Cf. fn. 1, p. 236.
situation types) than it is for the more familiar topics of common interest such as reference, quantification, modality, etc. However, there appears to have been virtually no mainstream of discussion of the former as there has been of the latter in the philosophical literature. The major reason for this may well be the preoccupation, since the beginnings of logical analysis, with sentences or propositions expressing or representing states, properties, qualities or relations and the tendency to either ignore the other sentence types—i.e., those denoting activities, actions, processes, events, etc.—or to attempt to assimilate them to the first class, assigning to 'John killed Fred', for example, the same logical form as 'John is taller than Fred'. It has therefore been through the back door, so to speak—i.e. via other sub-disciplines of philosophy such as metaphysics, ethics and philosophy of law, philosophical psychology—that the analysis of sentences describing non-static situations has come to receive the explicit attention of logicians, mainly during the past twenty years.  

6.2.2. Aristotle's 'kinēsis' and 'energeia'

Even though this tradition of excluding sentences expressing non-static situations from the study of logical systems goes back at least as far as Aristotle, it is nevertheless in the writings of Aristotle that we find what would appear to be the first explicit discussion of the fundamental aspectual distinction which pervades
both the logical-philosophical discussion of verb types and the linguistic discussion of aspect—under a seemingly limitless number of terminological guises. For Aristotle the distinction is that between 'kinesis' and 'energeia', for which the usual English translations are 'movements' and 'actualities'. The clearest characterization of the opposition (which has not been much improved upon since) appears in Aristotle's discussion of pleasure in *Ethica Nicomachea* although the term 'energeia' or 'actuality' is not in fact used in this passage:

> What pleasure is, or what kind of thing it is, will become plainer if we take up the question again from the beginning. Seeing seems to be at any moment complete, for it does not lack anything which coming into being later will complete its form; and pleasure also seems to be of this nature. For it is a whole, and at no time can one find a pleasure whose form will be completed if the pleasure lasts longer. For this reason, too, it is not a movement. For every movement (e.g. that of building) takes time and is for the sake of an end, and

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1 Some philosophers—like many linguists—are far from consistent in making or maintaining a distinction between situations (i.e. activities, events, processes, states, etc.) and their linguistic encodings and often express themselves in such a way as to imply a simple labelling of situations by verbs (cf. fn. 23), rather than by more complex constituents up to that of the entire sentence. (However, their examples often seem to imply an interpretation of 'verb' more in line with that of 'verb phrase' or 'predicate'.) Since it would be difficult to discuss the philosopher's observations and conclusions with more linguistic precision than they have accorded them in some of their writings, and because these insufficiencies will be given more attention when we come to discuss the linguistic literature, it has been found most expedient to follow the philosophers' use of such terms as 'activity', 'performance', 'state', etc. for both the extra-linguistic situations and the verbs (or verb phrases) occurring in the sentences denoting them when considering those passages in which the two have not been consistently distinguished.
is complete when it has made what it aims at. It is complete, therefore, only in the whole time or at that final moment. In their parts and during the time they occupy, all movements are incomplete, and are different in kind from the whole movement and from each other.

(Aristotle, 1945: 1174a)

The elements in Aristotle's description which we have underlined—that energeiai (such as seeing and deriving pleasure from something) are complete at any moment and that kineses take time, involve an end or goal ('telos') and are not complete until that end is attained—are, as we shall see, the notions which recur again and again in the linguistic as well as the philosophical literature on aspect.

Although Aristotle does not appear to be explicitly dealing with linguistic phenomena of any kind in the above quotation, he does, in another passage, correlate linguistic facts with his distinction insofar as he points out what can be said of these two types of situations:

E.g. at the same time we are seeing and have seen, are understanding and have understood, are thinking and have thought (while it is not true that at the same time we are learning and have learnt, or are being cured and have been cured). At the same time we are living well and have lived well, and are happy and have been happy. If not, the process would have had sometime to cease, as the process of making thin ceases; but, as things are, it does not cease; we are living and have lived. Of these processes, then, we must call one set movements, and the other actualities. For every movement is incomplete—making thin, learning, walking, building; these are movements, and incomplete at that. For it is not true that at the same time a thing is walking and has walked, or is building and has built, or is coming to be and has come to be, or is being moved and has been moved, but what is being moved is different from what has been moved, and what is moving from what has moved. But it is the same thing that at the same time has seen and is seeing, or thinking and has thought. The latter sort of process, then, I call an actuality, and the
This statement of Aristotle's has been interpreted by others (Kenny, 1963; Potts, 1965; Taylor, 1965) as providing 'tense criteria' for the different kinds of verbs—the non-past, non-inclusive tense implying the inclusive in the case of verbs of energeia, but not in the case of verbs of kineseis. Although it is quite clear that Aristotle is neither as explicit nor as formal as such an interpretation suggests, he nevertheless has grasped the significance of the tense distinctions (or, more accurately, tense and aspectual distinctions) with respect to the different kinds of processes being expressed. It should be pointed out, however, that this passage is rather loosely formulated, for such expressions as 'learn', 'move', 'walk', and 'build' must be followed by some constant complement (of a particular nature—cf. \( \S \) 5.2.5 and \( \S \) 5.2.6) in order for the entailments not to hold—e.g., learn a (particular) poem, walk to the theatre, build a (particular) house. This is obviously what Aristotle has in mind, as can be deduced from a study of other passages (cf. Aristotle, 1928: 1050a).

The underlined portion in the quotation immediately above suggests another logical property of kineseis—that there is a moment in their realization at which they necessarily cease to be.

Aristotle's discussion of the nature of movement in *Physica* reveals his view of the nature of this logical property:

And the fact turns out to be that movement is a realization, but an uncompleted one; because a potentiality, as long as it is such, is by its nature uncompleted, and therefore its actual functioning—which motion is—must stop short of the
completion: on the attainment of the end, the motion towards it no longer exists, but is merged in the reality.

(Aristotle, 1929: 201b)

Now, when anything moves from here to there it cannot have already got there while still moving thither (for instance, the man who is walking to Thebes cannot have already got to Thebes and be there at the same time as he is still walking to Thebes).

(Aristotle, 1929: 231b)

This element of automatic termination also finds its way into linguistic discussion (cf. Bull, 1960 and fn. 1, p. 233). However, it receives its most clear and explicit logical formulation by Taylor (1965: 88-9) in his exegesis of Aristotle:

For energeiai offer no parallel to the necessity of stopping, e.g. building a house once one has finished building it; that is to say, there is a distinction between finishing building a house and simply stopping building it to which there corresponds no distinction in the case of e.g. being happy. In the case of kinesis, but not of energeiai, there is a state the achievement of which counts as attaining the end towards which the activity is conceived as moving; it is, therefore, logically necessary that on the achievement of the state the original activity should stop, since it is logically impossible to get nearer to a state in which one already is. Energeiai, on the other hand, are not defined as activities in which one moves from one state into another; rather they are conceived of as activities in whose exercise consist those states towards which one moves, or causes other things to move, by engaging in kinesis. There is, therefore, no fixed terminal point for energeiai the attainment of which logically requires the cessation of the activity...we should say that kinesis are defined as processes towards a terminal state whose attainment requires the cessation of the process, whereas energeiai are defined as activities which have no such terminal state.

A further manifestation of the distinction between kinesis and energeiai pointed out by Aristotle is that the former can take place quickly or slowly, whereas the latter cannot.
For speed and slowness are thought to be proper to every movement.... For while we may become pleased quickly as we may become angry quickly, we cannot be pleased quickly, not even in relation to someone else, while we can walk, or grow, or the like, quickly. While, then, we can change quickly or slowly into a state of pleasure, we cannot quickly exhibit the activity of pleasure, i.e. be pleased.

(Aristotle, 1915: 1173a)

This property can be translated into linguistic terms (as is done in Kenny (1963)—cf. below) by saying that adverbials such as 'slowly', 'quickly' and, most generally, 'in so much time' can occur in sentences describing kinesis but not in those describing energeia.

It is significant for our hypothesis (that a spatial framework underlies aspect and proposition types) that Aristotle has chosen to call the one class 'kinesis' (movement) rather than using the more general term 'metabole' ('change'). (His use of 'movement' may be compared to our use of 'journey'—cf. § 7.1.) Even in his more scientific discussion of kinesis in Physica, Aristotle does not construe movement in a purely concrete sense but regards it as applicable in the more abstract domains of qualitative and quantitative change as well:

Movement in quality is what we call 'modification', which is a common term applicable to change in either direction between the contraries concerned.... As to quantity, there is no general term that applies equally to changes in either direction between greater and less; but 'increase' is used for the movement towards the full size, 'decrease' for movement in the contrary direction. As to motion from place to place, we have neither common nor particular terms, but let 'locomotion' pass as the common term, though the Greek word in its strict sense applies only to things which, in changing their place, have not the power to stop, and to things that do not move themselves from place to place.

(Aristotle, 1929: 226a)
However, whereas in the first two quotations above Aristotle includes what we have called existential causatives under the rubric of kineses, in *Physica* he explicitly excludes them. The following excerpt reveals his reasons for doing so and, in particular, his awareness of the problem of reference to, and movement of, non-existing entities:

And though 'is' and 'isn't' have other significations in addition to 'exists' and 'does not exist', yet in no case can that which 'is not' partake of motion... it follows that genesis cannot be a movement, for, if it were, the non-existent in its transit to existence would have to move. So... the case of absolute genesis would imply that the non-existent was already there and moving. But it cannot be in motion, nor, for that matter, at rest either. Besides these obstacles to any movement of 'that which is not', it may be urged, further, that anything that moves must have position, which the non-existent cannot have, since it is not anywhere. Neither can perishing be a movement; for the opposite of movement is either movement or rest, whereas the opposite of perishing is genesis.

(Aristotle, 1929: 224a)

Thus, Aristotle restricts kinesis in *Physica* to passings which occur between two positive terms (a starting point and a goal) which are contraries; this excludes genesis (the sheer coming-into being of what did not exist) and the reverse passage of perishing, both of which take place between the contradictories of 'being' and 'not-being'. Movement and genesis/perishing so distinguished together form the class of changes (metabolé).

However, despite the logical difficulties in assimilating genesis and perishing to the class of movements, Aristotle could not escape their striking similarities, often using 'metabolé' and 'kinesis' interchangeably and frequently punctuating his
discussion of movement with exemplification using existential causatives. This is true in the following passage where Aristotle summarizes what comprises a movement and incidentally remarks on the fact that it is the goal of a movement, rather than its origin, which is linguistically salient:

Now, if there is always a thing that causes movement directly and a subject that is moved, and there is also a time in which the movement takes place, and further a whence and a whither (for every movement is 'from that to this', and the thing that passes from 'that' to 'this' is distinct from both of them; the kindling log, for instance, is not itself either the 'heat' into which, nor the 'coldness' out of which, it passes)—all this being so, the movement, or passing, clearly pertains to the log itself and not to the condition of heat or coldness; for no quality or place or magnitude either causes movement or experiences it. We have, then, a mover and a moved and the 'whither' of the movement. (I say the 'whither' rather than the 'whence', because it is from its 'whither' that a process of change takes its name. Thus we call a change into non-existence 'perishing', though the 'whence' of the change is existence no less truly than its 'whither' is non-existence; and we call it 'genesis' if its 'whither' is existence, in spite of non-existence being its 'whence'.) Thus, to our previous account of movement we may now add that the 'form' and 'conditions' and 'place', which are all goals of movement, are themselves without movement, as for instance 'knowledge' and 'heat'.

(Aristotle, 1929: 224b)

Taylor (1965), in his exegesis of Aristotle, comes to the conclusion that kinesis would include existential causatives, more particularly those involving artistic creation or 'poiesis'. (According to Aristotle (1928: 1140b) "all art is concerned with coming into being, i.e. with contriving and considering how something may come into being which is capable of either being or not being, and whose origin is in the maker and not in the thing made"). Taylor claims (1965: 97) that "on Aristotle's view, every act of poiesis will be a kinesis, since the bringing into existence of, or bringing about
some qualitative charge in a substance has a fixed terminal point, viz. the point at which the object of the action has been brought into existence or at which the change in it is complete". However, it is difficult to assess this conclusion of Taylor's in regard to our discussion above about the relationship of genesis and perishing to the category of kinesis, for Taylor seems to favour throughout an interpretation or translation of 'kinesis' as 'change' rather than 'movement': "It is this feature of actions with a limit which accounts for Aristotle's calling them kinesis, the term kinesis being his general term for the process of change from one state into another" (1965: 89).

Besides recent exegesis (cf. Potts, 1965; Taylor, 1965), Aristotle's distinction between kinesis and energeia has recently inspired more explicit and rigorous classifications of verbs in English—most notably by Vendler (1967a) and Kenny (1963).

6.2.3 Kenny's 'performance', 'activity' and 'static' verbs

Like Aristotle, Kenny's interest lies not in the logical properties of different verb classes per se, but rather their application in the investigation and elucidation of such concepts as volition, pleasure and desire. However, he gives much more individual attention than does Aristotle to the classification of verbs and to the statement, in linguistic terms, of the criteria by

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1 Taylor also remarks (1965: 94) that "there seems no reason why one should not talk of bringing a state of affairs into existence, which would allow any change to be described as the bringing of some state of affairs into existence". This suggestion will take on more significance in our discussion of journeys (cf. § 7.6).
which they are distinguishable. Furthermore, although Kenny's classification is to be regarded as inspired by Aristotle's it is not dictated by it. He states his awareness from the beginning that "the distinctions which Aristotle makes, and the criteria by which he makes them cannot be simply carried over from Greek to English Idiom" (Kenny, 1963: 171).

However, the basic distinction between kinesis and energia appears to be valid in English as well. Kenny calls the former 'performances' and the latter 'activities', the two together comprising the class of 'actions'. Performance verbs are distinguished from activities, in English, by the fact that a sentence with a performance verb in the non-past progressive form implies the corresponding negative sentence with the verb in the non-past inclusive form, whereas for activity verbs this implication does not hold.\(^1\) Thus, 1. implies 2., but 3., containing an activity verb, implies not 4., but 5.\(^2\) This criterion for distinguishing performances and activities corresponds to that of Aristotle.

1. John is deciding whether to go
2. John has not decided whether to go

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\(^1\) Cf. §6.3.4.1, for Carey's (1957) similar formulation of this criterion for distinguishing between what he calls 'telic' and 'atelic' verbs.

\(^2\) Lemmon (1967: 101) suggests that this implication may not be valid: "...it is rather that if I am weeping then I have been weeping—"I have wept" may suggest that the weeping is recently finished, but then if I am building I also have been building." That is if the progressive form must be introduced, then the distinction between activity and performance verbs is blurred.
3. John is weeping
4. John has not wept
5. John has wept

However, Kenny realizes that in English the two sets of verbs distinguished by this criterion do not exhaust the total class of verbs, for the criterion requires that it be possible for the verb to occur in the progressive form, and there are some verbs for which this is normally not possible. This fact—that performance and activity verbs can both accept progressive aspect while some others cannot—allows Kenny to distinguish between action verbs and static verbs and hence between actions and states. (Thus, Kenny’s use of ‘static’ is comparable to Lakoff’s use of ‘stative’—cf. fn. 1 p. 278). Kenny’s examples are the following:

6. The man is learning how to swim
7. The man is looking for gold
8. The man is knowing how to swim

Another reflection of the difference between static and action verbs is that the former are not interpreted frequentatively when in the simple non-past form whereas the latter are—cf. 9. and 10.

9. John knows how to swim
10. John walks to school

Kenny gives other, less uncontrovertial entailments for distinguishing the three classes of verbs. All of these revolve around various combinations, between the antecedent and consequent, of the simple non-past, non-past inclusive, and non-past progressive forms
of the verbs. These have been scrutinized in Pott (1965) wherein it is maintained, among other things, that (1) the past/non-past distinction is irrelevant so long as the antecedent and consequent are both past or both non-past and, more importantly, (2) that progressive aspect is "logically significant only for performance verbs". He suggests the reason for this latter is that "it has the effect of transforming a performance into an activity; by this I mean that whereas sing is a performance (given the appropriate verb-root), being (engaged in) sing is an activity. Like an activity, it does not take time, but lasts for a time (according to whether the agent is quicker or slower; for a longer or shorter time)" (Potts, 1965: 83). We shall meet similar observations when looking at the linguists' treatment of aspect.

In the concluding sentence of Pott's remark above, he is referring to Kenny's diagnostic for performances, inspired by Aristotle, that they are "performed in a period of time" whereas "states and activities are prolonged for a period of time";

We may ask how long it took to paint the door blue, but not how long it took the door to be blue; it takes human beings twenty-one years to become adults, but there is no time which it takes them to be adults; thinking about a problem does not take time as thinking it out does. One can intend to do something for a long time, but one cannot take a long time to intend it; one may giggle for five minutes, but one does not take five minutes to giggle. We travel to Rome
This last observation reveals Kenny's awareness of an intimate connection between some activities and some performances. In the case of such activities the predication of 'success' implies that the associated performance took place. It is such performance and activity verb pairs which correspond most closely to Ryle's (1949) class of 'achievements with associated tasks' (cf. § 6.2.4).

Kenny also repeats Aristotle's observation that only performance verbs can occur with 'slowly' or 'quickly' and explicitly relates this to the temporal property of performances that they take time: "Because to do something quickly is to take a short time to do it; and to do something slowly is to take a long time to do it, only those actions which take time can be done quickly or slowly. Static verbs and activity-verbs cannot be qualified by these adverbs, but only performance verbs" (Kenny, 1963: 176). Lemmon (1967: 101), however, suggests that there are some activity verbs which also occur with 'slowly'/'quickly': "One can weep slowly, laugh slowly, talk slowly, and stroke slowly, though not live at Rome or keep a secret slowly". Wishing to maintain Kenny's analysis, Lemmon is led to propose that "the sense of the adverb in these latter cases is quite different from its sense as applied to performance verbs. Roughly, in the latter case it is an adverb of manner ... while in the former it means "it took a long time for ... to be completed". However, it is unnecessary, we believe, to accept polysemy in order to account for such cases of activity verbs with 'slowly'/'quickly'. In such contexts, the situation described is conceptualized as consisting of a succession of performances—each one being slowly or quickly performed—just as in the case of explicitly pluralized performances which also may occur with 'slowly' or 'quickly', as in 1. below.

1. The man repaired the broken windows slowly (so that he would be paid for more hours of work)

Thus we may compare the implicitly and explicitly encoded sequences of slow performances in the following pairs of sentences:

2.a. John talked slowly  
    b. John pronounced/uttered his words slowly

3.a. Mary prints slowly  
    b. Mary forms her letters slowly

4.a. The couple danced slowly  
    b. The couple executed/performed the steps slowly

Such activities (if they are such) as living in Rome and keeping a secret are homogeneous and therefore cannot be broken down into a succession of constituent performances. Hence, the exceptions which Lemmon refers to are also accounted for.

There is, however, another use of activity verbs with these (see next page)
Another distinguishing property of performance verbs noted by Kenny is that they can be embedded as the complement of 'finish' and 'half-way through', this not being possible, in general, with static and activity verbs—cf. 11. and 12. This he considers a

11. I've not yet finished drying the baby
12. I'm half-way through drinking the whisky

reflection of the fact that only performances can be complete or incomplete.

Kenny makes an important contribution to the logical analysis of performance verbs in his suggestion that they are all of the general form "bring it about that \( p \)", where \( p \) is ultimately a state or an activity. In this way he attempts to capture the fact that performances are, so to speak, specified by their ends and can go on in time only until the end state or activity is the case (cf. Taylor's formulation in §6.2.2). This formula comprehends, in addition to changes in the location, state or property of an object, existential causatives: "Building a house is bringing it about that a house exists...burning the gasworks is bringing it about that the gasworks does not exist" (Kenny, 1963: 178).

Kenny then makes some interesting observations about the semantic relationship between transitive performance verbs (i.e. performances

adverbs which cannot be explained in the same way. In sentences 5. and 6. it is the inception of a laugh or of a (complete)

5. Mary smiled slowly
6. Fred laughed quickly (to hide his anxiety)

smile—again implicit performances—which take a long or short time (cf. A smile slowly appeared across Mary's face).
of the form $A \phi B$) and intransitive performance verbs (i.e. performances of the form $B \psi C$) and the nature of change:

Now what $A$ does is very often what happens to $B$. When Nero set fire to Rome, one same event was both Nero's arson and Rome's burning. The same event would appear both in a list of things which Nero did and in a list of things which happened to Rome. No doubt the full description of any event of this kind would demand the mention of both agent and patient.

... But what is peculiar to the patient is that after the event its present state must be different from its state before the event. That is to say, after the event, there must be true of the patient, but not necessarily of the agent, some present-tensed proposition which was not true of it before the action took place.

The present-tensed proposition which is newly true of the patient is, of course, the proposition "$p$" which occurs in the description of the action in the form "bringing it about that $p$". So that when $A \phi B$, $A$ brings it about that $\phi B$, and the $\phi$ing is the $\phi$ing of $B$. But where "$\phi$" is not a performance-verb, or is a performance-verb which is grammatically intransitive, then the $\phi$ing is the $\phi$ing of $A$.

(Kenny, 1963: 179-80)

What Kenny is referring to here is the interplay of the syntactic relationships of transitivity and ergativity (cf. Lyons, 1968a: §8.2.3) and the semantic relation of consequence (whereby, in English, a sentence involving a performance verb in the non-past (or past) inclusive tense form implies a sentence encoding the

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1 Kenny's discussion does not hinge on the notion of change but it shares the same basic idea as is formulated more explicitly in von Wright's logic of change and action, which appeared in the same year.

2 cf. also Aristotle, 1928: 1050a-b.
resulting state or activity with the verb in the non-past (or past) non-inclusive tense—cf. § 8.2.2). In the case of grammatically transitive performance verbs, the subject of the consequent is the object of the antecedent; in the case of grammatically intransitive performance verbs, the subject is the same for both—cf. 13. to 15.

13. a. John has pushed the child into the room >
   The child is in the room
b. John has walked into the room >
   John is in the room

14. a. The farmer has killed the duckling >
   The duckling is not alive
b. The duckling has died >
   The duckling is not alive

15. a. Fred has darkened the room >
   The room is dark/darker
b. The sky has darkened >
   The sky is dark/darker

In some cases the same verb can function in both the transitive and the intransitive construction—cf. 15.

Given his basic formula for performances, Kenny is then able to distinguish two classes of activities—those which can be characterized as "attempting to bring it about that P" and those which cannot. Thus, says Kenny (1963: 184-5), "listening is attempting to hear, searching is attempting to find, treating is attempting to cure". Although the distinction is valid and important, Kenny's discussion of its linguistic reflexes is somewhat confused.
Finally, it is worth our while to record Kenny's reservations concerning the descriptive power of tense logics (as formalized by Prior) with regard to the tense and verb distinctions with which he is concerned. Kenny points out that since such tense logics distinguish only three tense operators ("it was the case that...", "it is the case that..." and "it will be the case that..."), they cannot bring out such differences as that between the progressive and the inclusive forms: "There is no way, for instance, of expressing in Prior's system the inference, for performance-verbs, from "A is ping" to "A has not ping". Since the tense is, in effect, passed on from the main verb of the sentence to the 'verb' of the operator, and since the verb "...is the case that..." is, by our criteria, a static verb, the result of Prior's system is to turn all verbs into static verbs" (Kenny, 1963: 105-6). Lemmon (1967: 97-101) expresses a similar opinion and urges tense-logicians to give more attention to these other tense and aspectual distinctions as well as to the logical structure of temporal adverbials. In particular, he stresses that an adequate tense logic must include, "in addition to the semantic notion of truth at a moment t, the further notion of truth over a period of time. Crudely, we need a logic of time-stretches as well as of time-moments".

Before turning to the very similar, but rather more comprehensive study by Vendler, it will be useful to take a brief look at the much earlier discussion given by Quine to various kinds of verbs. He recognizes a class of verbs which both Aristotle and Kenny tend to overlook or to mistakenly assimilate to the class of performances and which Vendler explicitly takes into account in his four-way
In The Concept of Mind, Ryle is interested in the logical properties of expressions used to talk about the powers and operations of the mind. However, in his investigation he is led to distinguish different types of propositions relating to human behaviour in general, according to the nature of the situation being described, whether peculiarly 'mental' or not. The basic distinction for Ryle is that between 'dispositional' words like 'know', 'believe', 'aspire', 'clever' and 'humorous' which denote abilities, tendencies or pronenesses to do or feel certain things in situations of various kinds and 'episodic' words such as 'run', 'wake up', 'tingle' which denote occurrences and are used when talking about how people do, or should, act and react. Of these latter, Ryle says (1949: 135) that "there are hosts of ways in which we describe people as now engaged in this, as frequently undergoing that, as having spent several minutes in an activity, or as being quick or slow to achieve a result". This distinction, although limited to the domain of human behaviour, would seem to correspond to Kenny's distinction between static verbs and activity verbs.

Within the class of episodic verbs, Ryle recognizes several sub-classes, including 'minding' (or 'heeding') verbs, examples of which are 'notice', 'take care', 'attend', 'concentrate', 'study', 'try', and 'achievement' (or 'success'/'failure', 'got it'/'missed it') verbs such as 'find', 'cure', 'win', 'solve', 'hold at bay'. Ryle characterizes these latter as follows, emphasizing their episodic nature:
These are genuine episodic words, for it is certainly proper to say of someone that he scored a goal at a particular moment, repeatedly solved anagrams, or was quick to see the joke or find the thimble. Some words of this class signify more or less sudden climaxes or denouements; others signify more or less protracted proceedings. The thimble is found, the opponent checkmated, or the race won, at a specifiable instant; but the secret may be kept, the enemy held at bay, or the lead be retained, throughout a long span of time. The sort of success which consists in descriing the hawk differs in this way from the sort of success which consists in keeping it in view.

The verbs with which we ordinarily express these gettings and keepings are active verbs, such as 'win', 'unearth', 'find', 'cure', 'convince', 'prove', 'cheat', 'unlock', 'safeguard' and 'conceal'; and this grammatical fact has tended to make people, with the exception of Aristotle, oblivious to the differences of logical behavior between verbs of this class and other verbs of activity or process.

(Ryle, 1949: 149)

Thus, it will be noticed right away that this class of verbs, the achievement verbs, is not entirely homogeneous, in that some of them denote occurrences which take place or are located at a moment in time whereas the others denote occurrences which are prolonged in time.\(^1\) We may note that Ryle's two kinds of achievements correspond to von Wright's (1963) productive actions and his preventive actions. That is, they differ in whether a new state of affairs is caused to come about or caused not to come about (cf. § 6.2.6). The latter would be activities according to Kenny, but the former

\(^1\) Accordingly, it should be remarked that Dowty's (1972) discussion of Ryle's classification of verbs is not entirely accurate. He claims (p. 17) that "Ryle... coined the term 'achievements' for the resultative verbs, to be distinguished from the irresulative activities. Achievements, such as win, unearth, find, cure, convince, prove, cheat, unlock, etc., are properly described as happening at a particular moment, while activities such as keeping a secret, holding the enemy at bay, kicking, hunting, and listening, may last throughout a long period of time".
(to which Ryle implicitly devotes most of his discussion) do not satisfy the set of criteria for performance verbs (even though Kenny erroneously includes several achievement verbs such as 'find', 'cure' and 'hear' within his class of performance verbs). Thus, rather than any particular temporal property, the distinguishing characteristic of achievements for Ryle appears to be the fact that they incorporate some notion of "success" or "failure". Because of this, the ascribing of success or failure to an achievement leads to an anomaly: "The fact that doctors cannot cure unsuccessfully does not mean that they are infallible doctors; it only means that there is a contradiction in saying that a treatment which has succeeded has not succeeded" (Ryle, 1949: 238).

However, a point which Ryle fails to make entirely clear is that whether the use of an achievement verb implies a notion of success or failure will depend upon whether it is implicitly or explicitly associated with what he calls a task verb. These correspond to those activity verbs which Kenny characterizes semantically as "attempting to bring it about that p". (Task verbs, insofar as they may be paraphrased by 'try' plus an achievement verb—indeed, this is in many cases the only way in which a task can be rendered, would appear to be a subclass of minding verbs since this latter includes the verb 'try'. They also co-occur with adverbs typically found with minding verbs—see below.) The task verb associated with 'find' is any of 'search for'/ 'look for'/ 'hunt for'. So if one looks for something and finds it, then one has been successful in one's search. If one doesn't find it, then the search has been unsuccessful. However, finding need not always
be prefaced by such an activity as looking for something, and when one accidentally finds something, then it is difficult to say that he has been successful in the same way. Ryle elaborates on the logically complex nature of achievements and their relationship to task verbs as follows (but we must bear in mind that these remarks apply only to those achievements which have an associated task performance):

One big difference between the logical force of a task verb and that of a corresponding achievement verb is that in applying an achievement verb we are asserting that some state of affairs obtains over and above that which consists in the performance, if any, of the subservient task activity. For a runner to win, not only must he run but also his rivals must be at the tape later than he; for a doctor to effect a cure, his patient must be both treated and be well again; for the searcher to find the thimble, there must be a thimble in the place he indicates at the moment when he indicates it; and for the mathematician to prove a theorem, the theorem must be true and follow from the premises from which he tries to show that it follows....

...They [achievements] are not acts, exertions, operations or performances, but, with reservations for purely lucky achievements, the fact that certain acts, operations, exertions or performances have had certain results.

(Ryle, 1949: 150-1)

Besides the adverbs 'successfully' and 'unsuccessfully' / 'in vain', Ryle gives other manner adverbs which can co-occur with task verbs but not with achievement verbs. These include 'carefully', 'attentively', 'vigilantly', 'conscientiously', 'methodically', 'laboriously', 'lazily', 'rapidly', 'reluctantly', 'deliberately' and 'confidently'. Except for 'rapidly', these adverbs all indicate agency on the part of the (underlying) subject (cf. Gruber, 1967; Macaulay, 1971; Cruse, 1973). This would
suggest that 'rapidly' is misplaced; and indeed, Ryle contradicts himself when he says at one point that it is proper to say of someone that he "was quick to see the joke or find the thimble" and at another that we cannot significantly say that "he saw the nest slowly or rapidly", where 'see' is to be understood as meaning "spot" or "detect". The fact that achievement verbs do co-occur with 'slowly'/'quickly'/'rapidly' and, in general, with adverbials of the kind 'in so much time' would appear to be what led Kenny to include them within his class of performance verbs. This confusion is straightened out by Vendler (cf. § 6.2.5).

In *Dilemmas*, Ryle discusses the logical properties of achievement verbs (though unfortunately not under that name) from a slightly different point of view and makes some additional observations which are pertinent to the present discussion. First of all, he remarks that "there are many verbs part of the business of which is to declare a terminus. To find something puts 'Finis' to searching for it; to win a race brings the race to an end. Other verbs are verbs of starting. To launch a boat is to inaugurate its career on the water; to found a college is to get it to exist from then on. Now starting and stopping cannot themselves have starts or stops, or, a fortiori middles either" (Ryle, 1954: 102-3).

Thus, in general, we can expect 'stop', 'finish', 'begin', 'be half way through', and 'continue' to be incompatible with achievement verbs—cf. 16. Moreover, "with certain reservations, verbs which

16. *Fred  
\[
\begin{align*}
&\text{began} \\
&\text{stopped} \\
&\text{finished} \\
&\text{was half way through}
\end{align*}
\] 
\[
\begin{align*}
&\text{finding his umbrella} \\
&\text{winning the race}
\end{align*}
\]
in this way declare termini cannot be used and are in fact not used in the continuous present or past tenses" (ibid.). Vendler also adopts this as a criterion for distinguishing achievement verbs, but, as we shall see, it requires some modification—perhaps these are the reservations to which Ryle is referring. In fact, Ryle appears to be considering the use of the progressive form mainly in conjunction with durative adverbials, in which case his generalization is correct—except for the particular case of iterated achievements which he himself takes into account:

The judge may say that he has been trying a man all the morning but not that he has spent the morning or any stretch of the morning in convicting him...

I could certainly say that I was finding misprints all morning, though not that I was finding some one misprint for any part of that morning. If I found one misprint after another, and the sequence of discoveries went on from breakfast to lunch, then I was finding misprints all the morning.

(Ryle, 1954: 103-4)

These additional observations of Ryle point towards a deeper understanding of the semantics of achievements as involving instantaneous transitions between particular states—for example between not knowing the existence or location of something and knowing it, as is the case with finding something.

6.2.5 Vendler's 'state', 'activity', 'accomplishment' and 'achievement' verbs

As has been found by several contemporary linguists (cf. Macaulay, 1971; Verkuyl, 1972; Dowty, 1972), Vendler's classification of verbs according to their 'time-schemata'—i.e. the manner in which they "presuppose and involve the notion of time"—achieves a
high degree of completeness and adequacy, despite some possible discrepancies among his various criteria for distinguishing the four classes and the inherent difficulty in attempting to match situations with verbs only. His categorization, first presented in 1957, is independent of Kenny's (and is not referred to by Kenny) and does not draw significantly from Ryle except, perhaps, in regard to his class of achievement verbs. Nor is Vendler's framework directly based on Aristotle's distinction between kineses and energeiai although he is obviously familiar with and undoubtedly influenced by Aristotle's discussions.

In Vendler's system, accomplishments (e.g. drawing a circle, writing a letter, running a mile) correspond to Aristotle's kineses and (roughly) to Kenny's performances while his states and activities comprise Aristotle's energeiai. However, he recognizes a fourth class of verbs (and situations) which do not fit neatly into either of Aristotle's categories and which, following Ryle, he calls achievements (e.g. reaching the summit, finding a treasure). The linguistic criteria by which he distinguishes the four classes of verbs consist of (a) co-occurrence with progressive aspect, (b) appropriateness of various kinds of temporal questions, (c) appropriateness of various kinds of temporal adverbials and (d) implications between sentences.

Occurrence versus non-occurrence of progressive aspect separates accomplishment and activity verbs from state (i.e. stative) and achievement verbs. Of an accomplishment one can ask how long it took and answer that it took so much time or that it was done in so much time. Of an activity one asks how long it went on
17. a. How long did it take to draw the circle?
   b. It took him twenty seconds to draw the circle
   c. He did it in twenty seconds

18. a. "For how long did he draw the circle?
   b. "He drew it for twenty seconds

19. a. For how long did he push the cart?
   b. He pushed it for half an hour

20. a. "How long did it take him to push the cart?
   b. "It took him half an hour to push the cart
   c. "He pushed it in half an hour

Furthermore, the following logical relations can be used to distinguish accomplishments from activities:

21. a. John drew the circle in twenty seconds
   b. John drew the circle in ten seconds

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Vendler, in fact, uses a sentence in the progressive form to illustrate this co-occurrence possibility. This is unnecessary and only confuses the issue—cf. Pott's remarks above on the semantic effect of the progressive form with respect to kineses and energeiai.
22. a. John pushed the cart for half an hour
   b. John pushed the cart for a quarter of an hour

23. a. John stopped drawing the circle
   b. John drew the circle

24. a. John stopped pushing the cart
   b. John pushed the cart

These facts lead Vendler to the conclusion that accomplishments "have a "climax", which has to be reached if the action is to be what it is claimed to be... they proceed toward a terminus which is logically necessary to their being what they are. Somehow this climax casts its shadow backward, giving a new color to all that.

1 Again, Vendler presents this inference with the verb in the progressive form— but accomplishment verbs in the progressive form would then satisfy the entailment as well:

   1. a. John was drawing a circle for twenty seconds
       b. John was drawing a circle for ten seconds

Although we have therefore, given the non-progressive alternative, it is no longer clear that the implication holds, for 22.a. seems to imply that John began to push the cart and didn't stop until half an hour later while 22.b. implies that he stopped a quarter of an hour before that. That is, the simple past tense in conjunction with a durational adverbial would seem to indicate the total duration of the situation, not a possible sub-part of it. Cf. fn. 2, p. 247.
went before" (Vendler, 1967a: 100-2). Activities, on the other hand "go on in time in a homogeneous way; any part of the process is of the same nature as the whole" (1967a: 104).

State verbs are distinguished from activity verbs essentially by the fact that the former do not accept progressive aspect (nor

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1 Bull (1960: 46) remarks, in this connection, that "an unfamiliar cyclic event [accomplishment] cannot be labelled or even defined as cyclic until its termination has been observed. The earth, for example, may move (a noncyclic event) without anyone being aware that it is revolving (a cyclic event). This discovery was not made in actual history until it was observed that the movement was repetitious. In short, then, the inceptive phase of a cyclic event can only be conceptualized as a noncyclic event. To revolve is only to move until one revolution is completed. To stir in bed is not getting up. It may be a prelude to getting up or the base for a prediction but it can be prolonged indefinitely without leading to a termination which can be described as levantarse." Bull goes so far as to deny the existence of an inceptive phase of a cyclic event—hence the impossibility of measuring its duration. This we feel is an unsatisfactory conclusion, for the characteristic temporal adverbial of accomplishment verbs—'in so much time'—expresses the measure of the interval of time bounded by the inception and the termination (= finishing point) of the accomplishment. What is true is that the inceptive phase of an accomplishment is the inception of an activity which only retrospectively (and often only subjectively) can be judged as having led to the climax or goal. We therefore prefer Gale's (1967: 151) formulation: "Just as being true, to use Ryle's phrase, is a valedictory epithet given to a prediction from a later moment of time when the predicted event occurs, so too being the beginning of a certain type of accomplishment process is a valedictory epithet given to the beginning of a process from a later moment of time when the process reaches its goal, thereby proving itself to be an instance of the type of accomplishment in question". We may note that Aristotle was also concerned with the fact that processes of change exhibit this asymmetry with respect to their beginnings and ends (cf. Aristotle, 1929: 236a).
adverbs such as 'deliberately' or 'carefully'), and hence Vendler anticipates Lakoff's (1965) distinction of stative/non-stative verbs (cf. also Palmer, 1965). Otherwise, the two appear to share the same kind of temporal determination—cf. 25. and 26.—and the

25. (For) how long did you love her? For three years.
26. (For) how long did you believe in the stork? Till I was seven.

same implications hold (with perhaps the same reservations as pointed out in fn. 1, p. 263):

27. a. I loved her for three years
   b. I loved her for two years
28. a. I ceased loving her
   b. I loved her

Thus, whereas activities are "processes going on in time, that is, roughly, ... consisting of successive phases following one another in time" (Vendler, 1967: 99), states are not processes although they can be in existence, in a homogeneous or continuous way, for shorter or longer periods of time.

The striking feature of achievement verbs is not that they cannot occur in the progressive form but rather that they can co-occur with point of time locative adverbials, as 29. and 30. illustrate. As it turns out, achievement verbs may take

29. a. At what time did you reach the top?
   b. We reached the top at noon sharp

progressive aspect, contrary to Vendler's claim, but this appears
to be limited to such iterative contexts as pointed out by Ryle and to contexts with a point of time adverbial (or an implicit point of time reference) which is simultaneously functioning as the temporal location of another situation, usually another achievement. However, unlike state verbs or activity verbs in the progressive form, which can also appear in such contexts, the achievement verbs in progressive form cannot accept durative adverbials--cf. 31. with 32. and 33. (and Ryle's observations above on the progressive form). However, Vendler does make a similar observation when discussing the

31. a. John was reaching the summit when I finally caught sight of him with the binoculars
   b. John was reaching the summit for two hours

32. a. Fred was asleep when the phone rang
   b. Fred was asleep for two hours

33. a. Bill was working when Mary arrived
   b. Bill was working all morning

fact that achievements can also co-occur with the temporal modification characteristic of accomplishments, as in 34. and 35.

34. It took him three hours to reach the summit

35. He found it in five minutes

Vendler remarks (1967: 104):

When I say that it took me an hour to write a letter (which is an accomplishment), I imply that the writing of the letter went on during that hour. This is not the case with achievements. Even if one says that it took him three hours to reach the summit, one does not mean that the "reaching" of the summit went on during those hours. Obviously it took three hours of climbing to reach the top. Put in another way: if I write a letter in an hour, then I can say
I am writing a letter at any time during that hour; but if it takes three hours to reach the top, I cannot say I am reaching the top at any moment of that period.

Vencler does not give any semantic characterization of achievements. He does point out that achievements can initiate states (and Taylor (1956: 92) goes on to remark that they can also mark the endings of states: "thus finding and losing are terminal points of having or possessing, and finding out and forgetting are terminal points of knowing") and in this respect carries on from Ryle. In particular, Vendler observes that many state verbs have an (inceptive) achievement interpretation as well as their static interpretation—for example, the "insight" interpretation of 'know' or 'understand' and the "spotting" interpretation of 'see' as in the following examples:

36. Finally he understood the problem

37. Suddenly I saw a boat on the horizon

Vendler recognizes two senses of such verbs, but this we shall see is unnecessary for the achievement interpretation is obviously contextually determined by particular temporal adverbials and prior information (implicit or explicit) that the state denoted by the verb was not in existence before the time indicated by the temporal adverbial (cf. Poutsma, 1926, and §5.3.3).

What we find lacking in Vendler's account is any discussion of the relationship between accomplishments and achievements, which
we consider to be a very intimate one, and, like those who preceded him, any concern or interest with the internal structure of the predicates which he labels as state verbs, activity verbs, accomplishment verbs or achievement verbs. In reference to this latter, Vendler classifies 'running' as an activity verb and 'running a mile' as an accomplishment verb but does not give any explicit recognition to the role here of the object noun phrase. Although Potts (1965: 78) notes, in a slightly different context, that a verb can shift its category if its 'filling' is omitted or varied and Lemmon (1967: 101) comments that "it is worth remarking that "play the piano" and "walk" are activity verbs but "play the Pathetique" and "walk to the pub" are performance verbs", it is generally the linguists who have given this problem explicit and extensive attention.

6.2.6 Von Wright's logic of change and action

Von Wright's contribution to the characterization of the different kinds of entities expressed by sentences is independent of the Aristotelian tradition with which we have been concerned so far and derives from his development of a logic of change and a logic of action as underpinnings for a deontic logic. His explanation of why such logics are necessary is most instructive.

1 Macaulay (1971: 101-2) remarks that "Vendler ... argues that "accomplishment" verbs "proceed toward a terminus which is logically necessary to their being what they are" ..., whereas "achievements" (though Vendler does not say so in these words) are more like the terminus itself". However, this insight into one aspect of the relationship between achievement verbs and accomplishments would appear to be to Macaulay's rather than Vendler's credit.
exist or endure.¹

Only states of affairs can correspond, in von Wright's system, to atomic propositions. All the others, we must assume, have a logically complex structure. Although no indication is given as to what kinds of molecular propositions would represent processes and activities, von Wright has some definite ideas about the logical structure of events and actions. Events are basically transitions between situations: some may be from a state to a process (e.g. to begin running) or vice versa (e.g. to stop running), some from one process to another process (e.g. for a walking man to begin running), and some from one 'state' of a process to another 'state' of a process (e.g. to quicken one's pace). However, the class of transitions which von Wright is exclusively concerned with are those from

¹ However, none of these predicates is appropriate for the expression 'fact', making von Wright's use of the term (a use shared by many philosophers) as a superordinate to states, activities, etc. rather awkward, if not suspect; and indeed he discontinues using it in his later articles. Although there is no need for us to embroil ourselves in a discussion of the philosophical status of facts, we may mention in this connection Vendler's (1967b) insightful discussion of facts versus events. He points out that such predicates as 'take place', 'occur', 'begin', 'last', 'end' are appropriate only with subjects denoting events (i.e. either perfect nominals or the expressions 'the event', 'the action', 'the process', etc.). These verbs do not occur with imperfective nominals or 'the fact' as the subject expression—ones more appropriate to these involve such notions as likelihood, expectancy and knowledge. Vendler concludes that whereas both objects and events are "in the world", each being directly or indirectly related to both time and space, facts are not in the world but rather "about things in the world".
one state of affairs on one occasion to a state of affairs on the next occasion. Such events he also calls changes. The end state of affairs need not be different from the initial one, and hence the term 'change' is given a broad interpretation to comprehend non-changes as well. Von Wright formalizes events with the propositional calculus by introducing a new binary connective \( T \) which he calls 'and next'. The formula \( \nu T \cdot p \) thus represents the elementary change described by '\( p \) and then not-\( p \)', which can be glossed as "the state of affairs \( p \) is followed on the next occasion by the state of affairs not-\( p \)". Similarly for the other three possible changes involving only one generic state of affairs:

\( \nu T \cdot p, \sim \nu T \cdot p, \sim \nu T \cdot p. \)

Acts are more or less equivalent to Kenny's performances. Recall that for Kenny a performance was a "bringing it about that \( p \)" where \( p \) stands for either a state or an activity. For von Wright, an act is the effecting of a change by a willful agent. This formulation is preferable to Kenny's for it allows one to distinguish productive action (e.g. opening a window) from preventive action.

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1 Von Wright makes a distinction between generic and individual states of affairs, the latter involving the coupling of a spatio-temporal location with the former: "Individually the same state, e.g., that the sun is shining in Pittsburgh on 1 March 1966 at 10 a.m., obtains only once in the history of the world. Generically the same state, e.g., that the sun is shining, can obtain repeatedly and in different places. Of the two..., the generic seems to me to be the primary one. An individual state is, so to speak, a generic state instantiated ("incarnated") on a certain occasion in space and time" (Wright, 1967: 121-2).
(e.g. keeping the window open), both of which would be of the same logical form according to Kenny since the end state is the same in each case. Furthermore, just as change includes non-changes, so act is interpreted so as to include forbearances (the omission of action) which, again, can be of two types—letting a change take place and letting a non-change take place (= letting a state of affairs continue).

Von Wright points out that a particular change or act cannot occur on any occasion whatsoever, but only on one in which the initial state of affairs involved in the change obtains: "Generally speaking, only on an occasion on which the generic state of affairs described by p obtains, can the generic change described by \( p \land \neg p \) or that described by \( \neg p \) take place or become effected ('at will')" (Wright, 1963: 37). This is one component of what von Wright calls
the 'opportunity' of an event or action: \(^1\) "We shall say that an occasion constitutes an opportunity for the happening of a certain generic event or for the doing of an act of a certain category, when the occasion has some generic feature which makes the happening of this event or the doing of this act (logically) possible on that occasion" (ibid.). He later enlarges this notion (derivatively in

\(^1\) It is of interest to note the following relationship between the negation of an event and the opportunity for its happening. Since the four elementary charges \(PT, \sim PT, \sim PT^p, \sim PT^p\) are jointly exhaustive and mutually exclusive, the negation of one is equivalent to the (exclusive) disjunction of the other three. Hence, \(\sim (PT \sim PT^p) \equiv PT \land \sim PT \land \sim PT^p\). However, if it is the case that the occasion of the initial state of the charge \(PT \sim PT^p\) constitutes an opportunity for the change to take place--i.e., \(PT\) does in fact hold--then two of the disjuncts are eliminated, leaving us with \(\sim (PT \sim PT^p) \equiv PT\). What appears to happen linguistically is that the usual interpretation of a sentence involving such a negated proposition, especially if it functions as an assertion rather than a denial, is that in which it is assumed that the opportunity for the change to take place did in fact exist. (This aspect of negation can perhaps be treated in terms of 'cancelled expectation'--cf. Leech, 1974: 319-20.) However, the other two interpretations are not impossible (the more so if we are concerned with the straight denial of the assertion of the positive proposition), the least unnatural of the two being that in which the final state is that which would have been the case had the event taken place, the most unnatural that in which both the initial and final states are opposite to those which would have been the case had the event taken place--cf. 1. through 3.

1. I know John didn't leave the party at 9:00 because I arrived just after 9:00 and he was still there

2. I know John didn't leave the party at 9:00 because I arrived just before 9:00 and he was already gone

3. I know John didn't leave the party at 9:00 because we happened to arrive together at just that time
the simplification of the calculi of 1963, where he does away with a "do" and a "forbear" operator) to include the counterfactual element implicit in agency or causality. Besides knowing the initial and end states which define the event effected by the agent, "we must be told the state in which the world would be had the agent not interfered with it with it but remained passive" (Wright, 1968: 43). Thus, for example, if a window is in an initial state of being open and will remain open supposing that no agent interferes, then the opportunity exists for either destroying this state (closing the window) or letting it continue (not closing the window). We need not go into the details of how this is formulated by von Wright.

It is suggested that the relationship of activities to processes is much the same as that of acts to events: "Acts effect the happening of events, activities keep processes going" (Wright, 1963: 41). Later, however, he suggests another relationship: "A change is accomplished through a process. Similarly, an action presupposes for its execution activity" (Wright, 1968: 39). It is this latter relationship, that between a process and an activity and between a change and an action, which appears to be somewhat elusive and which we will have to explore in what follows.¹

¹ We will want to say something like the following: any change is brought about by a directional process, which is to be differentiated from...other, non-directional processes which may characterize the mode of the former. Thus, if a bottle floats across a pond, the change is the going from one side of the pond to the other, the directional process the moving towards the other side of the pond, and the non-directional process floating (or being supported by the water).
Other than in his characterization of changes in terms of temporally successive states of affairs, von Wright takes little account of temporal facts in differentiating between his various kinds of situations. In particular, it is not clear whether accomplishments fall within his class of acts since all his examples of actions are ones which can be construed as simple, instantaneous transitions between states and therefore as achievements. However, if acts are the contents of norms (e.g., are what one can be obliged or allowed to do or not to do), then we must surely assume that accomplishments are also a kind of action. But this would cause some difficulty for von Wright's characterization of changes as successive states since in the case of accomplishments (such as going from London to Edinburgh) there will be many intervening states of affairs between the initial and end states which define the change. However, a more serious drawback to von Wright's work from the linguist's point of view, is that, with a very few exceptions, he gives no indication of what particular sentences of a natural language his formula might correspond to.

Dowty (1972: 48-9) argues that all achievements (in Vendler's sense) are analysable as simple changes (in von Wright's sense) and that such changes form an integral part in the analysis of accomplishments. Dahl (1973), on the other hand, interprets all changes and acts as momentary but as also including what Vendler calls accomplishments. This leads him to some rather counter-intuitive conclusions, such as, for example, that to build a house is an act which has no extension in time and that 'to be building a house' (which denotes an activity) is completely unrelated to 'to build a house' (denoting an act).
6.2.7 The treatment of situations as individuals

We can perhaps mention, before leaving our discussion of the logical tradition, the approach taken by logicians such as Reichenbach (1947) and, following him, Davidson (1967). Essentially, their analyses, the details of which we can not go into here, aim at establishing that events are individuals about which, like objects, "an indefinite number of things can be said" (Davidson, 1967: 91) and which can, in addition, be bound by the existential quantifier. In particular, Reichenbach points out the existential nature of the event predicates such as 'take place' and 'occur'.

Generally, the classifying of events as individuals rests on the observation that both objects and events have both a spatial and a temporal dimension. For Reichenbach, things are "aggregates of matter keeping together for a certain time" while events are "space-time coincidences and do not endure" (1947: 267). Lemmon (1967: 99) speaks of "space-time zones", two events being equivalent if they take both the same time and the same place. Perhaps Goodman's (1951: 357) characterization of a thing as a "monotonous event" and an event as an "unstable thing" is most felicitous in capturing the relationship.

For some discussion, cf. Verkuyl (1972: § 3.4.1). Verkuyl uses Davidson's analysis of action sentences as confirmation for his own characterization of the structure of event units, the determination of which is necessary for the delimitation of the upper bound of aspectual categories. The view taken here is that Davidson's analysis is not particularly enlightening since it leaves most of the internal structure of action and event sentences unexplained, and it is just this structure which determines the kind of temporal specification which they accept.
6.3: The linguistic tradition

6.3.1 General remarks

We will restrict our discussion of the conception and analysis of aspect and verb classification within the field of linguistics to the past one hundred years. This delimitation is not altogether arbitrary. For, although similar ideas to those implicit or explicit in 20th century discussion of aspect can be found in Aristotle's analysis and classification of Greek verbs (cf. § 6.2.1) or in the Stoics' analysis of Greek verbal inflections as involving semantically an aspectual dimension ("complete" versus "non-complete") besides the strictly temporal one (cf. Holt, 1943; Robinli, 1951; Lyons, 1968a: § 1.2.5), the real concern with and debate over these topics was inspired by 19th century investigation into the verb system of Russian and other Slavonic languages. In these languages, the morphological marking in verbs of some semantic element having to do with completion/perfectivity was particularly striking. However, parallels were rapidly sought and, with varying degrees of success, found in other Indo-European languages. It would be very difficult to survey, let alone inter-relate or integrate the myriad of observations, conclusions, classifications, terminologies, and detailed analyses which have resulted from this enthusiastic scholarship. Rather than undertaking such a formidable task, we will try to confine our attention throughout the following discussion to three particular issues.

First, there is the problem of what criteria—morphological, syntactic, semantic or some combination of these—are to be used in
establishing aspectual categories and determining what linguistic element(s) they are categories of. As we have suggested above, the recent trend has been, on the formal side, towards recognizing other criteria besides the strictly morphological. Of particular importance here is the use of the co-occurrence potential of different classes of temporal adverbials as an aid in determining the presence of one aspectual category rather than another. As we have seen, the philosophers have made explicit appeal to such criteria. On the other hand, semantic criteria (though mostly intuitive and informal to begin with) have competed with morphological ones from the very beginning; and their use has required a more sensitive investigation into what, semantically conceived, aspect is and whether it is a category of the verb or of some larger unit. The inevitable confusion over morphological and semantic determinants of aspect led, quite early, to the establishment of a distinction between 'aspect' and 'aktionsarten', this in turn engendering much debate. This distinction will be briefly discussed.

The second issue, which is directly related to and not really separable from this gradual recognition that aspect cannot be treated solely as a grammatical category of the verb, is the problem of realization. The same or similar aspectual distinctions to those in the Slavonic languages were found, in some languages, to be directly encoded in the lexical content of verbs rather than expressed by affixes of a more or less grammatical nature. Later, it became apparent that in many of these languages the lexical
features of the verb alone were not enough for a consistent assignment of aspect; other contextual factors—including the interplay of grammatical elements—must be taken into consideration. The culmination of this has been a configurational or compositional conception of the realization of aspect in languages such as English.

Thirdly, we must consider as we go along the actual aspecual categories which have been proposed, irrespective of whether such classifications have been intended to apply to verbal inflections, auxiliary and periphrastic constructions, lexical classes of verbs, or complexes larger than the verb. Despite the maze of terminologies, we will find a general, though not unanimous, agreement as to the major distinctions involved, and these will turn out, for the most part, to be highly congruent with those of the philosophers. 6.3.2 Aspect in Russian

The semantic distinctions with which we are concerned here—ones which we view as having to do with the existential status and temporal structure of linguistically encoded situations—have been most extensively discussed by linguists under the rubrics of aspect and aktionsarten and these as they pertain to or have been adapted from the analysis of the Slavonic verb system. In the Slavic languages there exist morphological variations in the verb—predominantly the addition of prefixes and suffixes, but also changes in the conjugation—which have been correlated with a semantic distinction termed 'perfective' versus 'imperfective'. According to Miller (1972: 219), "imperfective forms are said to be used when the speaker is thinking of an action in its development or ongoing; perfective forms are said to be used when the speaker is
talking about a completed action or is viewing the action as a whole. Whereas perfective forms denote completed actions, imperfective forms do not denote uncompleted actions but simply say nothing at all about the completion or non-completion of an action.¹ Thus, to give one of the classic examples from Russian, the verb 'писать' in 38. is imperfective, 'написать' in 39. perfective.

38. Он писал письмо "He was writing a/the book"
39. Он написал письмо "He wrote a/the book"

Whereas 39. implies that the book was completed, 37. carries no such implication (although it is not precluded).

Unfortunately, however, the situation is not quite so clear-cut as it may appear at first glance. First of all, besides expressing the on-goingness of the described situation, a sentence containing the imperfective form of a verb can also express iteration (cf. the French imparfait). Secondly, not all perfectivizing and imperfectivizing affixes can be added to all verb stems, although it

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¹ Cf. also Lyons, 1968a: 67.5.6, and Forsyth, 1970, on the marked nature of perfective aspect in Russian. Forsyth takes a more extreme position than Miller concerning the perfective/imperfective distinction in that he views it as a strictly privative opposition; whereas "a perfective verb expresses the action as a total event summed up with reference to a single specific juncture", the use of the imperfective is dictated "by the need to avoid the view of the action inherent in the perfective" (Forsyth, 1970: 9-11). The danger in regarding the imperfective as devoid of any positive content is that any strange uses of imperfective forms can then be simply ascribed to the need or wish to avoid the perfective.
does seem that there are some regularities, certain affixes tending
to occur with particular sets of verbs. Thirdly, there is a class
of verbs which resemble imperfective verbs in form but which do not
have corresponding perfective partners and similarly for a class of
verbs which are perfective in form (cf. Streitberg, 1971; Forayth,
1970). Furthermore, there is a large class of (formally) imper-
fective verbs for which the commonly accepted perfective partner is
one with an inceptive interpretation. The acceptance of these as
constituting imperfective/perfective pairs complicates the semantic
characterization of perfective aspect while their rejection increases
the number of verbs which are not susceptible to the imperfective/
perfective distinction and thus reduces its generality. Miller
(1970a, 1970b), however, has cogently argued that the imperfective/
perfective distinction, i.e. the category of aspect, concerns only
the class of 'active' verbs, i.e. those participating in the descrip-
tion of actions; and most of the unpaired (formally) imperfective
verbs and those having only inceptive perfective partners turn out
to be 'stative' or 'static' verbs, i.e. those which are employed to
describe states of various kinds.

Miller makes a distinction within the non-active verbs between
stative verbs such as 'ponimat' ('understand'), 'verit' ('believe'),
'dumat' ('think'), 'znat' ('know'), etc. and static verbs such as
'stojat' ('stand'), 'lezat' ('lie'), 'sidet' ('sit'). Sentences
with the former verbs but not with the latter can be paraphrased
by sentences in which the animate noun (formerly in nominative
case) appears in the dative case. Miller's class of static verbs
corresponds to one of the classes of verbs in English which are an
exception to the principle that (syntactically) non-stative verbs
Fourthly, the so-called perfectivizing prefixes do not all convey simply the 'grammatical' meaning "perfective" but may add additional nuances as well. In such cases, the perfective verb can be regarded as a new lexical item, and such an interpretation gains support when a secondary, suffixal imperfective exists. Thus, in the case of the imperfective/perfective pairs 'pisat'/'napisat' ("to write"), 'pet'/spet' ("to sing"), and 'sejat'/posejat' ("to sow"), the prefixes 'na-', 's-' and 'po-' merely add the notion of an inherent and attained limit to the situation (of writing, singing, sowing); and therefore the pairs differ only in perfectivity. Such perfective verbs do not yield, in general, secondary imperfective forms. On the other hand, the imperfective/perfective pairs 'pisat' ('write')/'zapisat' ('write down'), 'vizžat' ('whine')/'zavizžat' ('begin to whine'), and 'rasti' ('grow')/'vyrasti' ('grow up') differ along other semantic dimensions besides that of perfectivity; and for these there exist secondary imperfectives, differing only in aspect. Therefore, it can be argued that the perfective and secondary imperfective are the two aspectual forms of a single verb, which latter is a different lexical item from the original imperfective (cf. Miller, 1970b). However, there are some cases where the prefixed perfective appears to differ lexically from the stem imperfective but for which no secondary imperfective exists or for which the secondary imperfective has only an iterative interpretation. Such forms are often called aktionsarten (but this represents a slightly different specialization of the term than that which we will be considering). And there are other kinds of exceptions and peculiarities which complicate the system further.
Thus, even in Russian, the category of aspect cannot be divorced from the lexical properties of verbs and the process of word formation whereby a prefix spatially, materially, or temporally bounds or limits the situation denoted by the imperfective stem, or focuses on the crossing of one of its boundaries, making it ‘grammatically’ perfective at the same time.\footnote{In fact, one could analyze the entire process of prefixation as one of lexical derivation, the element of perfectivity being simply a semantic by-product, so to speak, of the combination of the lexical meanings of the verb and the prefix. Cases where the imperfective and prefixal perfective form a simple aspectual pair would then represent the special case of this process whereby the prefix has no semantic content other than that of an attained limit or an exhausted extension of the action described by the stem. This was more or less the view held by Streitberg (1891: 73): “Die bedeutung eines solchen compositums repräsentiert ein product aus drei verschiedenen factoren. Sie setzt sich nämlich zusammen: 1. aus dem materiellen bedeutungsinhalt des simplex, 2. aus dem materiellen bedeutungsinhalt der praeposition und 3. der modification der actionsart, welche durch die enge vereinigung der beiden unter 1. und 2. genannten elemente hervorgerufen wird und die in der hinzufügung des begriffes der vollendung besteht. Diese drei factoren sind von haus aus bei jedem compositum wirksam; nun können aber nach zwei seiten hin verschiebungen eintreten. 1. Die praeposition kann ihre selbständige existenz als solche einbüßen und dadurch in ihrer individuellen bedeutung in dem masses verblassen, dass sie bei der zusammensetzung mit einem verbum dem compositum keinen materiellen bedeutungszuwachs mehr zu bringen vermöge. In diesem falle wird die änderung der actionsart das einzige resultat der zusammensetzung sein; die praeposition ist also ein rein formales mettel zum ausdruck der perfectivität geworden”}

Besides the strictly morphological reflection of the aspectual categories in Russian, there are other criteria, syntactic
(distributional) and semantic, by which imperfective and perfective verbs can be distinguished. For example, Mazon (1971) sets up as the major and infallible criterion for deciding if a form is imperfective or not its co-occurrence potential with "budi" ("will be"), the so-called future tense of "byt" ("to be"); only imperfective verbs may follow it. However, distinctive co-occurrence patterns with temporal adverbials have, in general, been overlooked or given only implicit recognition in discussions of the imperfective/perfective distinction. Only recently have these been spelled out explicitly. Miller (1970a: 233), for example, observes that "verbs in imperfective aspect... do not occur with adverbial phrases like za čas (in an hour), za mesjac (in a month) with which verbs in perfective aspect do co-occur" while Forsyth (1970: 61) remarks that imperfective verbs "are frequently used with certain types of adverb expressing duration of time e.g. 'dolgo' ("for a long time"), 'vsju zimu' ("all winter") (which from the practical point of view may be said conversely to require almost exclusively imperfective verbs)". The parallelism here with the temporal specification which the philosophers found to be characteristic of kineses and energeiai (or accomplishments/achievements and states/activities), respectively, is striking and cannot be coincidental.

Considering now semantic criteria, we find that sentences with perfective verbs have implications which differ from those with imperfectives. Such properties have been invoked explicitly in Miller (1970a, 1970b, 1972). Thus, sentence 40, below implies 41, 42, and 43, whereas 41 implies none of 40, 42, or 43. (on the
6.3.3 The extension of 'aspect' to the description of non-Slavonic languages

To put the study of aspect in non-Slavonic languages in its historical perspective, we may take as our starting point the statement given by Streitberg (1891) concerning the status, classification and characterization of the aspects (or aktionsarten as he calls them).

Assumption that \( \text{pis'mo} \) has specific and constant reference throughout. Again, the similarity with the tense criteria of Aristotle, Kenny and Potts cannot be ignored.¹

Such semantic properties distinguish asp\( \text{p} \)ctual pairs which can be said to differ only in perfectivity from those in which the perfective form indicates inception of the state or activity denoted by the imperfective. Thus 1. implies 2. but not 3., and 4. is odd, if not unacceptable (cf. Miller, 1970a).

\[\begin{align*}
1. & \quad \text{On ponjal (perf.) knigu} & \text{"He has come to understand the book"} \\
2. & \quad \text{On pinimaet (imperf.) knigu} & \text{"He understands the book"} \\
3. & \quad \text{On bol'še ne pinimaet knigu} & \text{"He no longer understands the book"} \\
4. & \quad \text{?On končil pinimat' knigu} & \text{"He has finished understanding the book"}
\end{align*}\]
in the Slavic and Baltic languages. The view of aspect expoused here is representative of the findings and opinions of the Jung-grammatiker at that time, particularly of such Slavists as Viklosich and Leskien. The aspects are, first of all, recognized as semantic categories of the verb. Streitberg states that there are three major aktionsarten which "beherrsehen das gesamte verbalsystem"—the imperfective, the perfective, and the iterative. Imperfective aspect presents the action in its uninterrupted duration or continuation whereas perfective aspect adds to the meaning inherent in the verb the notion of completion: "Sie bezeichnet also die handlung des verbums nicht schlechthin in ihrem fortgang, ihrer continuitat, sondern stets im hindblick auf den moment der vollendung, die erzielung des resultates" (Streitberg, 1891: 71). The third major aspect, the iterative, presents the action in its repetition. The repeated action may be either perfective or imperfective.

Perfective verbs are further divided, according to their meaning but not according to form, into those of momentary aspect and those of durative aspect. Streitberg's semantic characterization of these

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1 Streitberg is careful to distinguish between an action being complete (or perfective) and an action being completed (or perfected), the latter being expressed by a combination of an aspectually perfective verb and the past tense: "Dabei ist es vollkommen gleichgültig, ob der auerblick der vollendung der vorgangenheit, gegenwart oder zukunft angehört; denn die aufgabe der tempusform ist es, die relative zeitstufe zu bestimmen, nicht aber die der aktionsart" (ibid.: 71).
is particularly insightful and immediately brings to mind, on the one hand, Ryle’s discussion of achievement verbs and, on the other, Aristotle’s definition of verbs of kineseis or Venler’s definition of accomplishment verbs:

a) Die perfectiven verba sind momentan, wenn sie den schwerpunkt einzig und allein auf den moment der vollendung, den augenblick des resultates lagen, alles andere unberucksichtigt lassen. Z.B. ubiti ˈerschlagen, d.h. ein resultat durch die handlung des schlagens erreichen. Von einer durativen, continuierlichen charakter der handlung kann hier keine rede sein, der ganze vorstellungsscomplex konzentriert sich vielmehr lediglich auf den zeit punkt, welcher die vollendung, das resultat, bringt.


(Streitberg, 1891: 71-2)

Unfortunately, Streitberg gives no criteria other than an appeal to one’s intuition about the meaning of the verb by which these two aspects could be reliably distinguished.

Streitberg also suggests the possibility of dividing the perfective verba—presumably both momentary and durative—into effective and ingressive verba: "Setzt man nfhlich den moment der vollendung in gegensatz zu den vorbereitungen, so kann man von effectiven, setz man ihn in gegensatz zu den folgen, so kann man von ingressiven verben sprechen" (ibid.: 72). However, this is regarded by Streitberg as essentially a subjective distinction (of
"no theoretical value") which depends on the verbal root or is determined by the context (cf. also Godel, 1950: 38). What Streitberg appears to be referring to here can be illustrated from English. The perfective verb 'fall asleep' expresses a transition between a state of wakefulness and a state of being asleep. In one context the emphasis may be on the exit from the state of wakefulness; in another it may be on the entry into the state of being asleep—cf. 44. and 45. However, since 'asleep' corresponds to the final state, the expression 'fall asleep' can be said to favour an

44. I tried to stay awake during the lecture but fell asleep within a few minutes

45. John fell asleep for three hours

Ingressive interpretation, as does that of 'wake up'. This is what we assume Streitberg means by the distinction depending also on the verbal root (cf. also 'lose consciousness' with 'fall unconscious').

Graphically, Streitberg suggests that imperfective verbs can be represented as unbounded straight lines, durative-perfectives as bounded lines, momentary-perfectives as points, and iteratives as rows of unbounded lines, bounded lines, or points.

The three major aspects were observed by Streitberg to be, in general, formally distinguishable. Perfectives were formed from imperfective roots by prefixation, iteratives from perfectives
or imperfectives by suffixation. He was also aware, however, of the problem cases—the unpaired perfectives and the unpaired imperfectives. Moreover, and as we have seen, he recognized the perfectivizing process as not strictly grammatical but rather to some extent lexical in nature—or, at least, lexically constrained and conditioned.

In this brief synopsis we find more or less all the semantic ingredients involved in the discussion of aspect in the ensuing years.

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1 Streitberg was mainly considering older forms of the Slavonic languages and in these the meaning of such suffixes was confined to that of iterativity. In later forms of the languages, such as Russian, the suffixes have, for the most part, lost their exclusively iterative meaning and have taken on, in addition, the expression of simple imperfectivity, the on-goingness of the action (cf. the discussion of secondary imperfectives in § 6.3.2).

2 One other distinction which is frequently made with respect to the Slavonic languages is that between verbs which denote activities which are multiphasal, which consist of a series of identical acts or events (such verbs being grammatically imperfective), and suffixal (and grammatically perfective) forms of the same verbs which denote a single occurrence of one of these normally repeated or continuous acts or events. These latter are called 'semelfactives'. Thus, whereas Russian 'стукать' means "knock at the door", the semelfactive 'стукнуть' means "knock a single time on the door" or "give a single knock on the door". The set of imperfective verbs which yield semelfactives should not be confused with those verbs in English which are inherently iterative, such as 'babble', 'cackle', 'rumble', 'hobble', 'chatter', 'teeter', 'tremble', 'shiver', 'quiver', 'throb', 'rattle', etc. The activities which these verbs denote are multiphasal, but individual complete phases cannot be singled out: 'to hobble once', 'to chatter once', 'to tremble once', etc. Rather, it is verbs which are usually, but not necessarily, understood iteratively (we might say they are pragmatically iterative) which have individuating counterparts: 'stir'/ 'stir once' (or 'give something a single stir'); 'walk'/ 'take one step'; 'talk'/ 'say one word'; 'tap'/ 'tap once' (or 'give one tap'); 'shake'/ 'shake once'; etc.
although each scholar almost invariably suggested a new or slightly modified terminology or promoted one or other of the distinctions to a superordinate status. Poutsma (1926), for example, claims the major aspectual distinction to be that between durative, momentaneous and iterative. Streitberg's imperfective aspect then corresponds to indefinitely durative aspect in Poutsma's system, (durative) perfective aspect to terminatively durative aspect. And Streitberg's subjective ingressive-perfective aspect is explicitly included as a sub-type of durative aspect in Poutsma's system.

1 The discrepancy here arises from the fact that within the class of verbs which denote actions happening instantaneously, some of these can be regarded as achievements (in Ryle's sense), i.e., as attainments of a goal, and hence perfective in Streitberg's system, whereas others do not imply some previous durative action directed towards a goal. These latter find no place within Streitberg's classification whereas the former remain unrelated to durative perfective verbs in Poutsma's system. Velten (1931), in his study of the origin of voice and aspect in Indo-European, provides us with a possible historical explanation for the heterogeneity of the class of momentaneous verbs (which property also characterizes Vendler's and, following him, Macaulay's (1971) class of achievements). Velten suggests that when the idea of duration was associated with the verb system of Indo-European, there existed two classes of verbal constructions—affective and actional. The affectives were locative constructions interpretable in either of two ways—e.g., (1) "sight (an image) is in me" or (2) "an image strikes me". The actionals indicated an action caused by the volition of the subject and did not involve such a locative construction. Given the distinction of durative/non-durative, interpretation (1) of the affective construction led to imperfective aspect whereas interpretation (2) led to momentaneous (inceptive) aspect. Likewise, the actionals divided into verbs of durative perfective aspect ("expressing an action directed towards an aim") and those of momentaneous-perfective aspect ("implying the attainment of a goal"). Velten observes that this latter group is identical, as regards its aspect (by which he presumably means its instantaneousness) with the inceptive verbs derived from the affective class. Thus, by superimposition three categories emerge: 'durative' (imperfective), 'instantaneous' (Poutsma's momentaneous and Streitberg's momentaneous-perfective) and 'terminative' (durative-perfective).
Streitberg himself was interested in demonstrating that the Germanic languages, in particular Gothic, also possess aspect as a category of the verb—i.e. morphologically conceived—and came to the conclusion that although lacking a morphologically reflected class of iterative verbs, it did possess perfectivizing prefixes analogous to the Slavonic languages, in particular the prefix 'ga-'. Those who contended Streitberg's conclusion did so mainly on the grounds that the prefixes were not simply grammatical but carried other elements of meaning besides "perfectivity". However, as we have seen, Streitberg was not operating with a strictly grammatical conception of aspect. It nevertheless appears to be the case that in the modern Germanic languages, such as German, the verbal prefixes, where they are still productive, are much less systematic in their aspectual content than in Russian; and the process is perhaps best viewed as entirely one of lexical derivation.

Even before Streitberg's attempt to extend the category of aspect to the description of the Germanic languages, Diez (1876), in his study of Latin and the Romance languages, was led to make a distinction between two classes of verbs which he labelled perfective and imperfective, which, as far as his semantic characterization

\footnote{Still earlier, Curtius (1852) applied the notion of aspect as conceived by the Slavists to the analysis of ancient Greek whose verb system also involves morphological variations having to do, on the semantic level, with a distinction similar to that of perfective/imperfective. However, the system is made somewhat more complicated by the existence of a third aspectual term, the aorist, which, in opposition with the imperfective, is unmarked for duration. Lyons (1968a: § 7.5.6) suggests that "the three-term opposition of perfective, imperfective and aorist in Greek is...the resultant of two binary distinctions: perfective (or completive) v. non-perfective, and durative v. non-durative."}
of it is concerned, corresponds to that of Streitberg's; and we may presume that it was inspired by the Slavic tradition. However, the interesting point is that Diëz lays no stress on the morphological reflection of aspect but rather the difference between the two classes of verbs with respect to the semantic implications of their passive participles:

Les participes passifs des transitifs dont l'activité ne se prolonge pas au-delà d'un instant, comme saisir, surprendre, éveiller, vaincre, abandonner, terminer, tuer, ou au moins implique un but momentané à atteindre, comme faire, établir, orner, bâtir, battre, charger, présentent l'action comme accomplie et parfaite, et le temps formé avec surn et ces participes répond au parfait latin également formé avec sum il nomico à battuto, l'ennemi est battu = hostis victus est; era battuto, était battu = victus erat.... Ce n'est que lorsque le verbe exprime une action qu'on ne commence pas avec l'intention de l'achever, comme aimer, hair, louer, blâmer, admirer, demander, voir, entendre et autres verbes analogues, que le participe uni à esse indique que l'action se passe au moment où l'on parle; egli a amato da tutti, il est aimé de tout le monde = amatur ab omnibus.... Pasé dans le premier cas répond à l'all. sein, dans le second à werden. On pourrait nommer les verbes de la première classe perfectifs, ceux de la seconde imperfectifs. Mais les participes de la première classe, en renonçant à l'idée de temps, prennent, comme déjà en latin (eruditus est, terra ornata est floribus), la valeur de simple adjectifs....

(Diez, 1876: 186-7)

This criterion and the distinction it engenders was found to be applicable to English as well and was taken up by Jespersen (1924: 272), who called the two verb classes conclusive (perfectives) and non-conclusive (imperfectives). Unfortunately, both Diez and Jespersen discuss under the category of non-conclusive only verbs which do not in any obvious way denote actions, i.e. state verbs in the philosopher's terminology. (Ota (1963), however, restricts his use of Jespersen's distinction to verbs denoting actions—cf. §5.2.8.)
More generally, it was found that, in the extension of the notion of aspect to the study of non-Slavic languages, a congruence between a formal (morphological) and a semantic (notional) characterization of the categories could not be maintained, especially if all and only those semantic distinctions involved in the Slavic aspectual system were taken as delimiting the semantic field involved and only grammatical processes such as affixation were considered. (It is also, of course, quite likely that scholars extended the concept of aspect with varying degrees of understanding of its original usage with respect to the Slavic languages.) In English and the Romance languages, in particular, scholars discovered that it was generally not possible to correlate the semantic distinctions involved consistently or systematically with any one type of linguistic element, grammatical or lexical. Sometimes the difference between the imperfective and perfective forms of a Slavic verb corresponded to a difference in lexical items (e.g. 'treat'/'cure', 'sit (an exam)'/''pass (an exam)', 'strive for'/'achieve'), sometimes to a simple verb versus a complex verbal group (e.g. 'sleep'/'fall asleep', 'read'/'read through')—although it will be recalled that the Russian equivalents of these differ as well by more than just perfectivity). And at the same time more obviously grammatical processes such as verbal inflections (e.g. the imperfect in French) and auxiliary constructions (e.g. the progressive form in English, the 'have' constructions in English and other languages) appeared to have partially overlapping semantic correlates with those of the imperfective and perfective Slavic verbs. In yet other instances, there seemed to be no simple or systematic means of rendering an
aspectual distinction other than by the addition of various types of complements or modifiers, i.e. through an apparently unsystematic interplay of various elements within the sentence.

Thus, we find by Jespersen's time an acceptance by many non-Slavicists of a basically notional approach to the study of aspect. Jespersen (1924: 286) states that there are four means of expressing the aspectual distinctions: by "(1) the ordinary meaning of the verb itself, (2) the occasional meaning of the verb as occasioned by context or situation, (3) a derivative suffix, and (4) a tense-form" (i.e. a verbal inflection or an auxiliary construction).

Contemporaneously, Poutsma (1926: 14-5) puts forth a similar view: "In English, as in other Germanic languages, the various aspects are partly implied in the meaning of the predication, partly by words modifying its meaning, partly suggested by the context of the sentence" (where a predication is, roughly, the action, state, or quality expressed by a verb). However, both Jespersen's and Poutsma's vague appeal to context as one way of rendering an aspectual distinction leaves it simply a rag-bag until the relevant contextual factors can be enumerated and their interaction with the lexical meaning of the verb made explicit.

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1 Poutsma gives as examples of these three possibilities the following: 'to arrive' (momentaneous aspect) versus 'to stay' (measurable duration) versus 'to pant' (succession of like acts); 'lie' (duration) versus 'lie down' (ingressive); 'she went to bed and slept instantly' (ingressive interpretation of 'sleep'). Cf. also Curme, 1934.
However, Jespersen also suggests that various semantic distinctions which had by that time congregated under the category of aspect should be distinguished as independent semantic parameters, \(^1\) some of which can then be shown to have characteristic realizations. Among these is the semantic distinction between conclusive and non-conclusive verbs which we have noted above and which Jespersen regards as simply lexical. The other distinctions include that of duration versus non-duration (as one of the functions of the progressive form), iteration versus single instance of action, stability versus change (i.e. "being in a state" versus "change into (or out of) the state"), resultative versus non-resultative, and finished versus unfinished. Jespersen maintains that this latter distinction is also one of the semantic correlates of the progressive form (e.g. as in He wrote a letter versus He was writing a letter).

However, he appears to ignore the fact that this distinction presupposes the presence of a conclusive verb (or, rather, verb phrase), and we can expect the semantic element of "unfinished" to be derivative of the basic meaning of the progressive form when applied to this particular class of verbs.

However, as early as 1908, efforts were made by the Slavists themselves to distinguish aspect as morphologically and grammatically

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\(^1\) In particular, Jespersen noted that 'perfective' as applied to Gothic by Streitberg comprehends different distinctions: sometimes it indicates "finishing", sometimes "inception", sometimes "obtaining through the actions" (e.g. 'ask' versus 'learn by asking'). However, we have already seen that a similar situation obtains in Russian.
conceived from aspect as morphologically but lexically conceived—
i.e., roughly a distinction between inflection and derivation.
Agrell (1908), in his work on Polish, retains the term 'aspect' for
the former and specializes the German term 'aktionsart' to refer to
the latter. Thus, the aktionsarten establish different lexical
classes of verbs; but all verbs, irrespective of their aktionsart,
are either perfective or imperfective. Simple aspectual pairs will
therefore belong to the same lexical class (more particularly, they
will be forms of the same lexical item) and will differ only with
respect to "on-goingness" versus "completeness" (cf. also
Miller, 1970b: § 5.1).

This distinction, once made within the context of the Slavic
languages, was again carried over by some scholars to the non-Slavic
languages, with varying degrees of distortion. As German possesses
a productive system of verbal prefixation, and as this had proven
to be more adequately handled as a matter of word building, the term
aktionsarten—now in its specialized use—was appropriate. In the
other languages, however, the distinction came to be interpreted as
that of grammatical inflection and/or the use of verbal auxiliaries
versus (lexical) verb classes. Thus Goedsche (1940: 191) states:
"We recognize now that what Streitberg called 'perfective action-
sart' is based on the lexical meaning of the verb. I suggest that
we keep the term aktionsarten for this analysis of lexical meaning,
but it should not be treated as a synonym of verbal aspect which
represents a syntactical meaning expressed by a special set of forms
as, e.g. in English by the expanded form" (cf. also Bodelsen, 1964).

However, such grammatical elements do not map directly onto the
semantic distinction perfective/imperfective which comprises aspect in the Slavonic model. Furthermore, the setting up of lexical classes or aktionsarten was now no longer constrained by the expression level to classes determined by prefixation; and hence the number of possible semantic distinctions now seemed theoretically unrestricted. Thus, to some the distinction between aspect and aktionsarten did not appear to make any important contribution to the already controversial status of aspect in general. Typical of his time, Vendryes (1942:84) lamented that "il n'y a guère en linguistique de question plus...difficile que celle de l'aspect, parce qu'il n'y en a pas de plus controversée et sur laquelle les opinions divergent davantage...". On n'est d'accord ni sur la définition même de l'aspect, ni sur les rapports de l'aspect et du temps, ni sur la façon dont l'aspect s'exprime, ni sur la place qu'il convient de reconnaître à l'aspect dans le système verbal des différentes langues". Thus, it is not surprising that many linguists abandoned as misguided the entire attempt to find in non-Slavic languages a category of aspect corresponding to the Slavic perfective/imperfective distinction, turning their efforts instead to the analysis of verbal inflections and auxiliary constructions in their own languages with no preconceived ideas as to the semantic categories of description appropriate to them and with little attention given to the lexical properties of the verbs. Two of the perhaps most independent thinkers of their time, Guillaume (1929) and Koschnieder (1929), had already put forth alternative conceptions of the notion of aspect to those of the Slaviciasts, both approaching it essentially from a theory of time and its interaction with the speaker.
However, others maintained the validity of the notion of aspect, and the distinction between this and aktionsarten, for the analysis of English and various other languages but attempted to give the distinction a somewhat different interpretation from that given it by the Slavicists. Aspect, it was suggested, depends upon the speaker's point of view and is therefore 'subjective'. Aktionsarten, on the other hand, have to do with the nature or development of the situation being described and is, in this sense, 'objective' (cf. Hermann, 1927; Porzig, 1927; Deutschbein, 1939; and, for discussion, Iviñescu, 1957). Although, as we shall see below, Deutschbein's application of the term 'aktionsarten' is somewhat more specialized than that of other scholars making the distinction between aspect and aktionsarten, his formulation of the subjective/objective opposition is perhaps one of the clearest:

Der Sprechende nimmt gewissermaßen einen Beobachterstand ein. Der Aspekt bezeichnet also die Orientierung eines Prozesses in bezug auf die Zeitrichtung vom Standpunkt des Sprechenden aus; die Aspekte haben dennoch einen subjektiven Charakter, da ich den Standpunkt beliebig wählen kann, während die Aktionsarten eine Phase oder ein Stadium eines Prozesses darstellen der objektiv dem Bewusstsein des Sprechenden in der Erfahrung gegeben wird.

(Deutschbein, 1939: 140-1)

Aktionsarten drücken die zeitlichen Relationen innerhalb des objektiven Prozesses aus, während die Aspekte die Eigentümlichkeit haben, daß sie eine perspektivische Schau über einen Prozeß darstellen, und zwar von dem Standpunkt des Sprechenden oder Erzähler:ten aus.

( HBid.: 147-8)

Thus, simplifying somewhat, Deutschbein analyses the verbs 'begin', 'continue' and 'stop', in construction with a complement verb, as
expressing ingressive, continuative and egressive aktionarten, respectively, since they each identify a particular objective phase of the situation which would be described by the corresponding sentence with the complement verb as the main verb. On the other hand, the auxiliary constructions 'have-en', 'be-ing' and 'be going to' are analyzed as aspect forms since they reflect the subjective perspective—retrospective, introspective (= imperfect) and prospective, respectively—from which the described situation is viewed.

The usefulness of this additional parameter is not altogether clear. Some scholars have attempted to see an intrinsic relationship between objectivity and lexical meaning, on the one hand, and between subjectivity and grammatical meaning, on the other. For example, Ivanescu (1957) suggests that an element of meaning in objective—i.e., an aktionart—since it is maintained throughout the conjugation of the verb whereas a subjective element—i.e., an aspect—depends on the perspective taken by the speaker and therefore varies from one temporal form to another. He then remarks (1957: 29-30) that "le caractère lexical ou grammatical des faits en question résulte de leur nature: ceux qui sont donnés en même temps que la nature de l'action verbale, qui y sont impliqués, ont un caractère lexical; ils ne varient pas à l'intérieur de la conjugaison d'un verbe. Par contre, ceux qui varient à l'intérieur de la conjugaison d'un verbe sont grammaticaux." However, Ivanescu has confused things here by considering only variations in the conjugation of a verb. Naturally, if one considers different grammatical forms of the same (lexical) verb, one will observe differences in grammatical (e.g., aspectual) meaning but not in the objective nature of the situation being described. If, however, the process is
reversed and the grammatical form kept constant while the lexical class of the verb is changed, then obviously the opposite will be found: the subjective viewpoint remains the same but the type of situation described varies.

A more useful way of looking at the relationship, and this is perhaps what Ivanescu has in mind, is that the (grammatical) aspectual distinctions are subjective in the sense that they are superimposed on the aktionsarten but not vice versa. There are different perspectives from which a situation may be viewed, but not, in any obvious way, different objective phases of a perspective. Thus, one may have begun, be beginning or be going to begin writing a letter, but it is odd to say that one began to have written a letter or began to be writing a letter or began to be about to write a letter. In this respect we may compare the following remarks of Sten (1952: 97, 99) on the superordinate function of the imparfait and the passé définit:

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1 Thus, according to Anderson's (1972: 5) hierarchy of 'quasi-predications', that which represents progressive aspect must come above those which represent inception, continuation and cessation.

2 Unfortunately, Sten uses the terms 'perfectif' and 'imperfectif' for both the grammatical aspects and the lexical aktionsarten (as well as for the situations described), giving the impression that the semantic distinctions involved are the same in both cases. However, perfective verbs are those "pour lesquels l'action n'a pas eu lieu si elle n'est pas portée à son terme" while the passé simple (perfective aspect) "s'emploie quand il est question d'actions delimitées, fixées". Imperfective verbs are those for which "l'action s'effectue vraiment dès qu'elle a commencé, sans avoir besoin d'attendre la fin" whereas the imparfait (imperfective aspect) "nous présente des actions comme si elles se déroulaient devant nos yeux, nous ne voyons qu'une seule de leurs phases" (cf. Sten, 1952: 8-9, 96).
Mais la langue peut... changer les verbes imperfectives en "perfectifs" en les mettant au passé simple, de même qu'elle transforme les soi-disant perfectifs en imperfectifs par le moyen de l'imparfait (ou du présent).

... de même qu'un imparfait peut dilater une action perfective, de même un "défini" peut raccourcir (mieux: synthétiser) une action qui demandait plus ou moins de temps.... C'est l'aspect du temps qui compte, non l'"Aktionsart" du verbe.

We shall return to these observations when we come to look at Garey's (1957) contribution to the study of aspect.

Let us now look more closely at Deutschbein's system. The main insight with which we are concerned here is that there is potentially room for a threefold classificational system according to (1) purely grammatical aspect (e.g. progressive aspect in English), (2) semi-grammatical or semi-lexical aktionsarten (e.g. expressions identifying phases of situations such as 'begin', 'continue', 'stop', etc.) and (3) lexical verb classes (e.g. conclusive versus non-conclusive verbs). Although Deutschbein recognizes and distinguishes these three categories most explicitly, in his practical analysis of English he is somewhat inconsistent in his application of the distinction between (2) and (3). However, this is quite understandable given the facts of English (and other languages) and the conception of grammar at that time. For example, since the aktionsarten are themselves realized as verbs, they too can be classed as conclusive or non-conclusive while since some verbs (e.g. 'learn', 'stay', 'lose', 'cure') denote particular phases of the situations denoted by lexically distinct verbs (e.g. 'know', 'be at', 'have', 'treat') these can be considered as incorporating an aktionsart. Other complications arise due to the fact that the co-occurrence potential of the verbs of aktionarten is dependent, in
part at least, on the class of the complement verb. Similarly, there are restrictions on the co-occurrence and interpretation of the aspectual forms with respect to both aktiomarten and verb class. Finally, there are the various implicational relationships which hold between the aspects and the aktiomarten. The extent of these interrelationships reflects the centrality and complexity of this part of the grammar, and also demonstrates the need for a rather more powerful model of syntax than was available during Deutschbein's time.

However, it is interesting from the point of view of the present study to look briefly at Deutschbein's discussion and characterization of (3) above, the lexical class of the verb. His name for this is the 'zeitcharakter' of the verb; and thus he explicitly associates it with time and, as the following quotation reveals, with existence:

...Wir wollen dieses zeitliche Moment, das in jedem Verbalbegriff enthalten sein muß, als Zeitcharakter des Verbum bezeichnen, dieser Zeitcharakter ist zunächst vollkommen unabhängig von der aktuellen Einzelsituation, in der Prozeß sich vollzieht.


Bezeichnet damach das reine Verbum zeitlich intensive Größen, so ergibt sich daraus, daß die Natur der Verb in bezug auf die zeitliche Ausdehnung verschieden ist. So gibt es Verba, die eine begrenzte Dauer ausdrücken, z.B. Schreiben, Essen, andere wieder erwecken die Vorstellung von unbegrenzter Ausdehnung, z.B. Sein und Haben.

Der Zeitcharakter ist also an das Wort als Repräsentanten einer Vorstellung gebunden.

(Deutschbein, 1939: 134-5)
It is Deutschbein’s notion of the ‘temporal intension’ of a verb—
that element of its meaning which constrains the potential extension
of the situation described—which we find particularly insightful
and suggestive of the analysis of proposition types in terms of their
internal temporal/existential structure that we will be proposing
later on. The actual categories of zeitcharakter which Deutschbein
recognizes conform more or less to those of Streitberg, including
the distinction between ingressive and effective perfective verbs.
We may also note that Deutschbein observed that different temporal
questions corresponded to differences in the zeitcharakter of the
verb: “Im Deutschen läßt sich der Unterschied zwischen durativen
[^non-conclusive] and nichtdurativen[^conclusive] Verben auf folgende

1 Cf. Guillaume’s (1964: 47-8) distinction between implicit and
explicit time: “Le verbe est un semantème qui implique et
explique le temps. Le temps impliqué est celui que le verbe
emporte avec soi, qui lui est inhérent, fait partie intégrante
de sa substance et dont la notion est indissolublement liée à
celle de verbe. Il suffit de prononcer le nom d’un verbe comme
“marcher” pour que s’éveille dans l’esprit, avec l’idée d’un
procès, celle du temps destiné à en porter la réalisation.
Le temps expliqué est autre chose. Ce n’est pas le temps que
le verbe retient en soi par définition, mais le temps divisible
en moments distincts—passé, présent, futur et leurs interpréta-
tions—que le discours lui attribue.... Est de la nature de
l’aspect toute différenciation qui a pour lieu le temps impliqué.
Est de la nature de temps toute différenciation qui a pour lieu
le temps expliqué.” Although we cannot follow up Guillaume’s
rather idiosyncratic theory of the verbal system, we may note
that he characterizes a verb as being inherently imperfective or
perfective according to whether “le verbe implique le temps
immanent qui est du temps qualitativement incomplet...auquel
manque une époque, le futur” or whether “le verbe implique
le temps transcendant, qui est du temps qualitativement complet...
auquel ne manque aucune époque” (ibid.: 51).
So far, in keeping with the tradition which we have been discussing, we have talked in terms of verb classes and aspectual properties of verbs. Although as early as 1920 Wackernagel observed a certain indeterminacy with respect to the distinction between so-called perfective and imperfective verbs ("Ich will nur bemerken, dass manche Verben weder perfektiv noch imperfectiv sind" (1920: 156)) and Harkel (1929: 31-2) would admit only a distinction between "Verben mit imperfectivischer Tendenz" and "verben mit perfektivischer Tendenz", it appears to be only in the last two decades or so that detailed and explicit attention has been given to the questions of exactly what linguistic unit these categories apply to and of what the precise role of the intra-sentential context is.

We may take as our starting point two observations by Sten (1952). The first is that which we noted above—namely, the interaction of aspectual categories (i.e. those expressed by the imparfait/passe défini) and aktionsarten or verb classes (e.g. conclusive/non-conclusive) such that a conclusive verb such as 'se noyer' takes on properties reminiscent of inherently non-conclusive verbs, such as 'jouer', when it is in the imparfait form, and vice versa with the passé défini of non-conclusive verbs. His second important observation concerns the role of the complement of the
verb: "Jouer" est un verbe imperfectif? Cui, p. ex. dans il joue au bridge. Mais il m'a joué ce tour? Souvent ce n'est pas le sens du verbe seul qui importe, mais le sens du verbe + ses complements de differentes sortes" (1952: 9).

Garey, (1957) has sharpened Sten's rather unsystematic observations into analytic tools for distinguishing between telic and atelic constructions (rather than simply verbs--see below). If a sentence contains a telic construction, then in imperfective aspect (imparfait in French, past progressive form in English) it does not imply the corresponding sentence in perfective aspect (passe compose)

1 Several years earlier, Vendryes pointed out the possibility that aspectual distinctions could be covert, depending on the context of the verb for their expression: "Il peut arriver que des nuances d'aspect passent inaperçues ou ne se reconnaissent qu'à la reflexion parce qu'elles n'ont pas de marque extérieure qui leur soit propre... L'addition d'un régime direct modifie l'aspect du verbe. Quand on dit en français: Voici un verre, bois. Cela veut dire: Porte le verre à tes lèvres. Mais si l'on dit: Voici un verre, bois-le. Cela veut dire: Fais que le verre soit vide. La différence est mince; elle existe cependant, même si la langue française n'en a pas tiré parti pour se créer une catégorie spéciale" (Vendryes, 1946: 86).

2 Garey's use of telic and atelic corresponds to Aristotle's kineses/energeia, Streitberg's perfective/imperfective, Jespersen's conclusive/non-conclusive. Telic verbs (or constructions) are those "expressing an action tending towards a goal" while atelic verbs (or constructions) "are those which do not have to wait for a goal for their realization, but are realized as soon as they begin" (Garey, 1957: 100)—though he surely means the actions described rather than the verbs in the latter definition!
in French, simple past in English). In the case of a sentence with an atelic construction, the implication will hold—cf. 46. and 47. The other implicational relationship which Garey points out,

46. a. Jean s’est noyait ⊃ Jean s’est noyé
   b. John was drowning ⊃ John drowned
47. a. Jean jouait au bridge ⊃ Jean a joué au bridge
   b. John was playing bridge ⊃ John played bridge

and which carries over into English as well, is that a sentence in which the verb is in the perfective form implies the corresponding sentence with the verb in the imperfective, irrespective of whether the construction is telic or atelic—cf. 48. and 49.

48. a. Jean s’est noyé ⊃ Jean se noyait
   b. John drowned ⊃ John was drowning
49. a. Jean a joué au bridge ⊃ Jean jouait au bridge
   b. John played bridge ⊃ Jean was playing bridge

Garey’s informal discussion of the semantic interaction of imperfective and perfective aspect with atelic and telic constructions is also valid for English and, again, is suggestive of our own analysis, particularly with respect to the last two combinations discussed in the following passage:

An imperfective tense applied to a telic verb has the effect of hiding the arrival or nonarrival at the goal. It is this circumstance that gives the illusion that the lexical sense of a telic verb is ‘go towards a given goal’—like the thrashing around in the water denoted by se noyer.

A perfective tense applied to a telic verb expresses the attainment of a goal. This creates the illusion that the achievement of the goal is part of the lexical meaning of such a verb; here se noyer seems to include the notion of death as an attained goal.
A perfective tense applied to an atelic verb affirms the existence in time of an action, including its cessation.

An imperfective tense applied to an atelic verb expresses the existence of an action without saying anything about its beginning or its end.¹

(Garey, 1957: 108)

Garey next tackles the question of what, besides the verb, determines whether a construction is telic or atelic. Although he makes a significant advance from Sten's observation in recognizing the role of the semantic properties of the direct object noun phrase, it might be said that he obscures his insight by talking in terms of

¹ As intimated above in our discussion of Jespersen, we will argue that the semantic function of the imperfective (progressive) form of telic constructions is reducible to its basic function—which is most transparent in atelic constructions—of expressing the existence (at a point in time) of the action, the non-implication of attainment of the goal resulting from a deductive argument roughly of the following nature. If a telic action is 'finished' (i.e. the goal attained) then the action necessarily stops. If the action is in existence (as expressed by the progressive form), then it hasn't stopped. If the action hasn't stopped, then it isn't finished and hence the goal has not (yet) been attained.

As for the perfective (expressed by the simple form), we would like to suggest that what is essential is the having been in existence and the having gone out of existence of the action, but whereas the activities or processes denoted by atelic constructions come to an end (i.e. an arbitrary end)—they 'cease' or 'stop'—the perfective of telic constructions carries the additional implication that the action came to its end (i.e. its natural, inherent, goal-defined end)—it 'finishes'.
'atelic' and 'telic' noun phrases (and complements, in general).

It is not clear how these epithets, as he defines them for verbs (or actions), are applicable to nouns (or objects). But one may nevertheless applaud the following observation of his, which appears again in Verkuyl (1972):

The word jouer has several meanings: one is to be occupied with some sort of vague childish activity; another, to play a game; a third, to make music with an instrument; and a fourth, to complete a game or a piece of music. Here we begin to see more clearly into the problem. If there is a direct object, and if this object designates something that has a structure with a temporal ending to it—a game of chess or of tennis, a Beethoven sonata—the expression verb-plus-object is telic.

In the contrary case, if the complement of the verb is atelic—aux échecs 'chess', du violon 'the violin', du Beethoven 'some Beethoven'—or if there is no object (for example, il a joué toute la journée 'he played all day', il joue très bien 'he plays very well'), the expression is atelic.

(Garey, 1957: 107-8)

Thus, Garey sees verbs as inherently specified as telic or atelic, but in the case of an inherently atelic verb such as 'jouer', the aspect of the construction of which it is the nucleus is determined by the aspect of the complement: "it is only the complement that puts a term to the activity, which itself does not change essentially while it goes on" (ibid.: 108).

Now, what about constructions involving inherently telic verbs, such as 'se noyer' and 'sortir'? Garey's conclusion here is not as convincing as that for the atelic verbs, for he is led to suggest that such constructions are telic no

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1 Garey employs the term 'aspect' for both sets of categories: perfective/imperfective and telic/atelic.
matter what the aspect of the complement may be. But even Garey's own example does not support such a conclusion. He discusses the use of 'sortir', which in intransitive constructions is telic (and hence, one may suppose, inherently specified as telic) but which in transitive constructions ("to pull/take out") may be interpreted as either telic or atelic if the direct object involves the partitive construction, as in 50. below. The two interpretations

50. Pierre sortait du papier de son bureau
("Pierre was pulling paper out of his desk" (atelic) and "Pierre was pulling some/a piece of paper out of his desk" (telic)) depend upon the interpretation of the partitive. This example also emphasizes the inappropriateness of the distinction telic/atelic as applied to the complement of the verb: in this case, it is rather a 'mass' versus a (singular) 'count' interpretation of the object which determines the aspect of the construction. This applies to such atelic verbs as 'jouer' as well, as Garey's own examples reveal:

51. Jean jouait un concerto du Mozart
52. Jean jouait \{ du Mozart \} des concertos du Mozart

6.3.4.2 The relationship of zeitcharakter to categories of the noun

Whereas Garey has extended a categorization of verbs to the class of nouns, it has been rather more common to do the reverse, interpreting the conclusive/non-conclusive verb class distinction in terms of, or on analogy with, or as a more abstract manifestation of the distinction in nouns between count and mass and, within the former, between singular and plural. Thus, Sten (1952: 9) observes
the following parallelism: "de même que la distinction entre des
substantifs numératifs et des substantifs massifs n'est pas trop absolue (des sucres, manger du curé) de même on n'a tout juste que le droit de dire que "généralement parlant" tel ou tel verbe appartient "plutôt" à l'uns ou à l'autre des catégories /de perfectif et imperfectif/". (Cf. Haas' (1973) discussion of 'semantic tendencies' with respect to nominal and verbal categories.) And Weinreich (1963: 161), drawing on Quine's (1960) distinction between nouns having 'divided' reference and those having 'undivided' (or 'cumulative') reference, suggests that the same distinction is operative within the class of verbs, divided reference being manifested as 'punctual' (= conclusive) zeitcharakter, to use Deutschbein's term, and, if plural, iterative zeitcharakter; undivided reference presumably as durative (= non-conclusive) zeitcharakter.\(^2\)

\(^1\) Quine states (1960: 91): "It is in full-fledged general terms like 'apple', or 'rabbit', that peculiarities of reference emerge.... To learn 'apple' it is not sufficient to learn how much of what goes on counts as apple; we must learn how much counts as an apple, and how much as another. Such terms possess built-in modes, however arbitrary, of dividing their reference.... So called mass terms like 'water', 'footwear', and 'red' have the semantical property of referring cumulatively: any sum of parts which are water is water."

\(^2\) Sandmann (1954: 181) also suggests several similarities between the noun and the verb, the most pertinent of which is that between collective nouns and (lexically) iterative verbs: "Not only do we have verbal forms parallel to the general and the individual use of the noun, but also forms parallel to the collective noun (e.g. the government), to which corresponds the representation of a number of individuals in a unity. It is the case of the 'iterative' verb, where representation of a sequence of individual acts is necessary to the constitution of the verbal element. Such verbs are, for instance, to flutter, to twitter, to stammer, to whittle, etc. Generally speaking, iterative verbs are imperfective (= non-conclusive), unless they are made perfective (= conclusive) by some contextual factor as in to whittle down."
However, as Sten has pointed out (cf. also Quine, 1960: 91), there is a certain degree of indeterminacy with respect to the count/mass distinction in the case of some nouns. Allen (1966: 192) rightly observes that "certainly some nouns, e.g. cake, do not seem to suggest "count-ness" more than they suggest "mass-ness" or "mass-ness" more than "count-ness": it is not until we know whether the noun cake is used with the determiner a or else comprises the whole of a nominal itself (or is used with a determiner like some) that we can be sure whether it is a so-called count noun or a mass noun. He concludes that rather than treating such nouns as belonging to different categories, it is more appropriate in such cases to apply such labels as 'count' and 'mass'—or, in his terms, 'bounded' and 'non-bounded'—not to the nouns themselves but to the noun phrases of which they are the head or nuclei. Other nouns, Allen suggests, are inherently specified as 'bounded' (e.g. 'pencil') or as non-bound (e.g. 'gas', 'food'). Now, looking back at Garey's analysis, the analogy on the level of zeicharakter would be to say that some verbs, such as 'jouer', are not inherently atelic, or non-bounded, to use Allen's terminology, but rather unspecified: only the higher-order construction constituted by the verb and its complement is non-bounded or bounded, which one depending on the interaction of the verb and the semantic properties of the complement. But, corresponding to the inherently bounded nouns, there would be inherently bounded verbs (e.g. 'drown') and to the inherently non-bounded nouns, inherently non-bounded verbs (e.g. 'believe').
Thus, we see already a gradual realization that the categories of zeitcharakter may be compositional, higher-level categories, and that rather than the complement of a verb changing the class of the verb, it is the semantic interaction of the verb and the complement which defines or produces or realizes a particular zeitcharakter. We may note here, in anticipation, that this is the essential difference between the approaches taken by Macaulay (1971) and Verkuyl (1972). Whereas Macaulay, like Carey, views every (non-stative) verb as either perfective or imperfective (Macaulay uses these terms for both categories of aspect and of zeitcharakter), this specification being copied or reversed at a higher level depending on other contextual elements, Verkuyl treats the categories of zeitcharakter as pertaining to a higher-level unit (a clause) only although dependent, in part, upon certain semantic (non-aspectual) categories of verbs. Leech's (1969) approach is midway between these two.

However, before discussing these three studies in detail, let us pursue somewhat further the observed parallelism between zeitcharakter and the nominal categories. As we have remarked, one can go beyond the realm of analogy and seek in the two parallel distinctions a deeper semantic unity. This is implicit in Carey's use of 'telic'/ 'atelic' for both nouns and verbs and explicitly, but in the reverse direction, in Allen's use of 'bounded'/ 'non-bounded' and Leech's 'count'/'non-count' for both. We may ask ourselves what could be the basis for such an underlying semantic unity.

Noun phrases which are non-bounded/atelic/mass can be seen as
referring to entities which are spatially homogeneous, i.e., every part is, for all practical purposes, referable to by the same noun phrase as the whole. This is true both for inherently non-bounded nouns (e.g. 'gas', 'milk') and for non-bounded noun phrases (e.g. 'some apple', 'some egg') in which the nuclear noun can also participate in bounded noun phrases (cf. 'an apple', 'an egg').

The property of homogeneity becomes clear when we contrast such phrases as 'some apple', 'some egg' with 'an apple', 'an egg'. If one is asked to put some apple in a pie or some egg on a slice of toast, the person who made the request would be slightly aghast if the core of an apple was added to the pie or the shell of an egg presented on toast. The use of such noun phrases presupposes the referent is, or is regarded as, in some condition of homogeneity—a cored, possibly peeled apple and a shelled, beaten egg. 'An apple' and 'an egg', on the other hand, presuppose some lack of homogeneity, the presence of some distinguishing physical or structural property making it possible to define or give 'boundaries' to discrete instances or units of apple and egg (cf. fn. 1, p. 310).

Now, non-bounded/atelic/mass verbs or constructions can similarly be viewed as homogeneous—in this case temporally rather than spatially—by which is meant that at each moment at which the described situation is in existence, all defining properties of the situation are present. That is, the nature of the situation does not vary with time; in one sense, the situation is complete at every moment (cf. the first quotation from Aristotle in § 5.2.). So, just as some apple is apple, or some water is water, so if John was asleep all night, then he was asleep at any moment in the night.
The temporal homogeneity of such constructions was made explicit by Bull (cf. fn. 1, p. 233) and by Vendler (cf. §6.2.5). (One may also make reference to Hirtle's (1967) discussion of states and actions.) On the other hand, bounded/telic/count verbs or constructions lack this temporal uniformity because part of the defining characteristics of the situations they describe is their termination, more precisely, the attainment of the goal inherent in their meaning. This phase is, at least conceptually, of a radically different nature from the rest of the action and hence serves to define or bound discrete instances or units of the situation (e.g. of drowning, playing a rubber of bridge, etc.) Hence, just as one can pluralize bounded noun phrases, one can pluralize or iterate bounded verbal constructions. And, the lack of homogeneity is reflected by the different range of temporal adverbials which can modify such constructions. In particular, adverbs of the 'for so long' type, which require temporal uniformity or continuity, are unacceptable. Finally, just as a part of an apple is not an apple, so the fact that John was drowning does not imply that John drowned.

However deep this semantic parallelism may extend, it is certainly the case that the use of such labels as 'telic'/acentric' or 'bounded'/'non-bounded' or of features such as +COUNT/-COUNT for both the nominal and the verbal categories does nothing more than state that such a semantic regularity exists; it goes no way towards making its nature explicit nor of giving a natural explanation for it. To do so, of course, is as yet an impossible task. However, we hope to shed at least some light on one half of the
parallelism by trying to make explicit what it means for the
situation or action described by a sentence to be bounded or non-
bounded, telic or atelic, +COUNT or -COUNT, leaving for others the
equally formidable task of explicating the underlying nature of
these categories as they pertain to nominals. (However, we will,
in fact, broach this latter problem in the restricted domain of
linear, i.e. one-dimensional, entities as these bear the closest
parallel to temporal entities, i.e. situations—cf. § 7.3.2.)

Before doing this, however, we must look briefly at more
recent investigations into the nature of aspect and zeitcharakter,
particularly with respect to English, and attempts to systematize
their description. The studies which we will look at are those of
Leech (1969), Macaulay (1971), Verkuyl (1972) and Dowty (1972). As
these each differ in their orientation and descriptive framework, as
well as in the range of facts they consider, and since the last
three, in particular, are structured by some rather complex argument-
ation, we can treat only certain of the more relevant aspects of each
and these only with a certain degree of thoroughness.

6.3.4.3 Leech's state and event predications and rules of semantic
concord

Leech distinguishes between event predications and state
predications; he thus regards his categories as pertaining ultimately
to proposition-like units. Unfortunately, Leech does not explain what is semantically entailed by this distinction, instead identifying it with the count/mass distinction in nouns (or terminal clusters) and, following the convention by which a feature of the whole predication is associated with the medial cluster (cf., for example, negation), representing event predications by the presence of the feature +COU(INT) in their medial cluster, state predications by the presence of -COU.

As it difficult to discuss Leech’s account of aspect without making reference to his extremely detailed and rather complicated descriptive framework, the reader is first referred back to the outline of his system given in §2.3. Secondly, we may mention here the three major relative systems introduced by Leech to represent the relation of states and events to time. These are \( \rightarrow \text{TIM}, \rightarrow \text{DUR} \) and \( \rightarrow \text{FREQ} \). The formulae \( (X) \rightarrow \text{TIM} \cdot b \), \( (X) \rightarrow \text{DUR} \cdot b \), and \( (X) \rightarrow \text{FREQ} \cdot b \) are to be understood as "X at time b", "X lasts for time b", and "X with frequency b". We may point out at the outset that the introduction of these systems as primitives (cf. atomic predicates) of the semantic system of time begs a lot of questions and makes it impossible not only to give an explicit account and natural explanation for the characteristic temporal specification of different types of predication, but also to account for the relationship between location at a time and duration for a time or between duration for a time and happening with a certain frequency or between location at a number of times within an interval and happening with a certain frequency. With respect to the first point, we may observe that the formula \( (X) \rightarrow \text{TIM} \cdot b \), where b is a point in time, would represent both the meaning of John arrived at 10:00 and John was asleep at 10:00. The formula \( (X) \rightarrow \text{TIM} \cdot b \), where b is an interval of time, could represent the meanings of John arrived in 5 minutes, John arrived in the afternoon, John wrote a letter in 5 minutes, John wrote a letter in the afternoon, and John was asleep in the afternoon. We see here that \( \rightarrow \text{TIM} \) takes on various interpretations (or has different implications) depending upon the nature of X and of b. This semantic information has been left to the intuitions of the reader to discern instead of having been made explicit.
However, Leech does set forth a set of five criteria by which one can establish if a predication is an event or a state. These comprise (1) Jespersen's test for conclusive and non-conclusive verbs, (2) the occurrence of frequency adverbials with event predications but not with state predications, (3) an iterative interpretation of event predications versus a non-iterative interpretation of state predications in the inclusive tense, (4) an instantaneous or iterative interpretation of event predications versus a non-iterative, non-instantaneous interpretation of state predication in the simple non-past tense, and (5) a sequential interpretation of conjoined event predications versus a simultaneous interpretation
of conjoined state predications. However, in a sense, these five criteria turn out to be vacuous, for in his definitions of the tenses, for example, Leech has distinguished as separate meanings of each tense from those interpretations which differ according to the type of predication involved. Thus, one of the definitions of the present tense is that of an event perceptually taking place in its entirety at the moment of speech and thus contains the ascription feature +COU. We will return to this problem in a moment.

Leech also observes that durational adverbials tend to occur with state predications, but he feels that "this tendency must be treated as a factual likelihood rather than a semantic rule, since it is possible for adverbials of duration and adverbials of frequency to co-exist in sentences like He often waited for ten minutes." If the principal predication were assigned the feature -COU by the contextual properties of -DUR, this would conflict, in such sentences, with the feature +COU assigned by -FREQ" (Leech, 1969: 136-7). The difficulty posed by such sentences is, we suggest, only apparent and possibly arises from attempting to account for aspectual phenomena by the simple device of features like +COU, whether inherent, transferred by concord, assigned by contextual redundancy rules, or ascribed by higher predicates (see below). In the sentence in question, the domain or scope of the two adverbials is quite different: 'for ten minutes' gives the measure of the duration of the man's waiting while 'often' expresses the frequency with which the man waited for ten minutes. Even in Leech's own system, however, this distinction in scope can be represented: \((X)' \rightarrow \text{DUR} \quad \text{a} \rightarrow \text{FREQ} \quad \text{b}\). It can be seen that no conflict in the specification of COU necessarily follows, for X is assigned -COU by the contextual requirements of -DUR- whereas all of \((X)' \rightarrow \text{DUR} \quad \text{a} \) is assigned +COU by those of -FREQ. However, such contextual redundancy rules would be unnecessary if the semantic system was capable of representing the fact that a durational adverbial such as 'for ten minutes' bounds or limits a state predication such that it behaves, in some respects, like a +COU predication. We see this type of semantic interaction as no less central to predication-typing than that covered by Leech's rules of semantic concord (see below).
What we would like to look at now is exactly how COU comes to be attached or associated with (the medial cluster of) a predication. Leech recognizes four ways in which this may happen. First, some verbs are inherently specified as +COU, such as 'kick', 'open', 'start', 'fall'; and one is left to presume that a predication containing such a verb as its medial cluster is always +COU irrespective of its context (cf. Garey's conclusion concerning telic verbs and the constructions in which they participate). However, unlike Garey, Leech claims that no verbs are inherently specified as -COU "because there seems to be no verbal (or adjectival) meaning that cannot occur in the same clause with an adverbial of frequency or "number of times"" (Leech, 1969: 136).

In the case of such inherently unspecified medial clusters, the predication assumes the specification of its object by a process of 'semantic concord' which Leech (1969: 137) describes as follows:

Semantic concord is analogous to syntactic concord in that it consists in the distribution of matching properties amongst different elements of a structure. Features from the systems of 'countability' and 'singular'/plural' are amongst those which are frequently shared by more than one cluster within the same predication, and especially by the medial and final cluster, when these correspond to the verb and object of a clause. Consider the three sentences:

(a) Jane writes  \( j \rightarrow w \rightarrow o \) (-COU)
(b) Jane writes books  \( j \rightarrow w \rightarrow b \) (+COU +PLUR)
(c) Jane writes a book  \( j \rightarrow w \rightarrow b \) (+COU -PLUR)

Whereas in (a) the verb write without any complement invites interpretation as an undivided state (-COU) (= 'is a writer'), the plural countable complement books in (b) leads one to interpret the verb iteratively (ie. to extend to the medial cluster w the features +COU +PLUR). Equally, the singular a book of (c), if it permits one to interpret the sentence in any way whatever, permits only the interpretation of a single complete action in the present (+COU -PLUR), as, for example, in the "historic present".
However, there is a problem here. If it is the case that medial clusters can be inherently specified as +COU but not as -COU, then the set of sentences below do not exhibit the semantic concord which

53. John hates ice cream
54. John hates Mary
55. John hates all the women he knows

Leech's analysis of (b) and (c) above would lead us to expect. 'Hate' is certainly not an event verb nor are the complete predications in these sentences event predications, using Leech's own criteria. This would tend to suggest either that one must allow verbs to be inherently specified as -COU or, what perhaps amounts to the same thing, recognize a category of verbs or medial clusters which do not participate in the +COU/-COU distinction. This category would be the state verbs of the philosophers, their actional verbs (comprising activity, accomplishment and achievement verbs) being those which undergo the +COU/-COU distinction (cf. Ota's (1963) classification and, for Russian, that of Miller (1970b)). One of the more important respects in which Macaulay's (1971) treatment represents an improvement over Leech's is his explicit recognition of the fact that stative verbs do not participate in the basic distinction of conclusive/non-conclusive or +COU/-COU. Before leaving the discussion of semantic concord, we may observe that Leech's analysis of (a) in the above passage might seem to imply that there is a general rule to the effect that if the direct object of a transitive verb (i.e., the terminal cluster to the right of the medial cluster) is semantically 'zero' (represented by the dummy symbol $\emptyset$), then,
unless specified otherwise, the medial cluster (and hence the predication) is specified as \(-\text{COU}\). However, from Leech's treatment of tenses (cf. above and below), (a) receives its interpretation of \(-\text{COU}\) from an ascription feature belonging to (one of) the semantic representation(s) of the present tense.

The third means by which a predication can come to have \(+\text{COU}\) or \(-\text{COU}\) associated with it is through the application of the contextual redundancy rules associated with the relative systems \(\rightarrow \text{FREQ}\) and (in light of fn. 1, p. 318) \(\rightarrow \text{DUR}\), respectively. The fourth means, to which we have already made allusion, is by means of ascription features belonging to the medial clusters in the definitions of the tenses. If the predication is already specified as \(+\text{COU}\) or \(-\text{COU}\), then either the ascription features will match (and therefore be redundant in the semantic representation of the entire sentence—a result which we find unappealing) or they will contrast and the whole semantic representation of that interpretation of the sentence rejected. The interesting cases would therefore be when the basic predication is unspecified for \(\text{COU}\).

The only cases of unspecified predications after the application of rules of semantic concord and contextual redundancy rules will be cases like (a) above, i.e., Jane writes or, to give another of Leech's examples, John works in a factory.

Let us look at the problem in somewhat greater detail. For example, Leech suggests there are three uses and hence three definitions of non-past tense (considering only those involving reference to the time of utterance). These are (1) the unrestricted present, which "denotes a state of affairs of indefinite duration continuing
through the present moment...", (2) the instantaneous present, which "refers to an event psychologically perceived as taking place in its entirety at the moment of speech" and (3) the habitual/iterative present, which describes a general state of affairs continuing through the present moment and consisting of repeated events. Each definition will therefore contain an ascription feature: -COU in (1), +COU in (2) and +COU +PLUR in (3). For example, Leech argues that "since the unrestricted present is the one sense associated with state predications, its definition must contain the ascription feature -COU" (Leech, 1969: 130). But surely this is making things more complicated than they need be: if the predication which is embedded in the tense specification is a state, then -COU is already in the semantic representation of the sentence and need not be repeated in the definition of the tense form. The need and viability of COU ascription features therefore

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Leech's admirable attempt at capturing in his formalism the meaning of the habitual or iterative present—that a (regularly) repeated event constitutes a state of affairs existing at the moment of utterance—unfortunately fails to the extent that it relies on the reader's intuition as to how to interpret, among other elements, that of -TIM (cf. fn. 1, p. 316). What we hope is a faithful literal gloss of his representation of this meaning of the present tense is "the happening of the event X at a number of times is (at) now". Quite a lot must be read into this gloss to come up with all that is implicit in our understanding of sentences such as He digs his own garden. This is certainly not to disparage Leech's analysis, for we consider it to be pointing in the right direction and, although the descriptive framework which we will be putting forth will hopefully suggest a way to make explicit what Leech has had to leave implicit, we do not at this time have a more adequate analysis to propose for such sentences.
rests on (1) the existence of (untensed) predications which are unspecified for COU but which are at least subjectively so specified when tensed and (2) such tensed predications being (at least subjectively) three-ways ambiguous. With regard to (1), it is impossible to determine if such predications exist since the very criteria by which we can determine whether a predication is +COU or -COU depend upon the interpretation of different tense forms. Looking now at (2), even if we could determine that such predications exist and if, for the sake of an example, 'John works in a factory' is such a predication, it would be difficult to maintain that the non-past form John works in a factory is interpretable in the three ways we are concerned with: as an unrestrictive present, an instantaneous present and as an iterative present. The only interpretation which it can sustain is that of the iterative present. If one wishes to claim that it can also be interpreted as an unrestrictive present, i.e. that "John works" is viewed as -COU, this is merely a reflection of the fact that the iterative present involves the viewing of a regular repetition of events as a state which is true at the time of utterance.

However, there is a stronger reason for doubting the validity of Leech's use of ascription features here. When we shift our attention to the interpretation of the past tense form, we find that
the three interpretations are repeated. The only difference is that an event need not be subjectively instantaneous since it now has the whole past-time sphere rather than the moment of utterance in which to take place. This suggests most forcefully that the three 'senses' of the past and non-past tense forms have nothing per se to do with them but rather with general principles concerning the way different types of situations involve the time dimension, the different ways they project onto the time axis. States have no internal temporal structure whereas actions, achievements and accomplishments do. Thus to say a state is "at a time" has rather different implications than to say an achievement is "at a time". These are issues to which we will be devoting considerable attention.

1 Leeceh excludes the possibility of an unrestricted past interpretation of the simple past form, this having the ad hoc but desired effect of accounting for the implication of "completion" (which apparently is the content of +COU). However, Leeceh considers only examples with activity verbs or with durational adverbs, these latter tending to bound or complete a situation independently of any tense form. When we look at sentences containing verbs denoting states and point of time adverbials, we find an unrestricted interpretation is the only natural one:

1. We (already) lived in Surrey at that time... and we haven't moved since.
2. John was asleep an hour ago... and he probably still is

This is further evidence that the perfective/imperfective distinction is definable only with respect to non-state predication--cf. the clear contrast in the minimal pair below:

3. John slept this afternoon
4. John was asleep this afternoon
Looking at Leech's use of the ascription features $+$CON/-CON from a more general point of view, it would appear that one kind of fact he wishes to capture with them is what earlier scholars noted as the perfectivizing nature of the simple past tense form\(^1\) (cf. Sten and Garey above). However, we feel it is misguided to attempt to use the same semantic primes to represent both the (temporal/aspectual) semantic properties of basic predications or propositions, what we have been calling 'zeitcharakter' (i.e. conclusive versus non-conclusive or telic versus atelic or state versus activity versus accomplishment versus achievement) and the (aspectual) semantic effect of the absence versus presence of the progressive form, to which we have gradually been trying to restrict our use of the term 'aspect' (e.g. perfective versus imperfective, an event seen in its entirety versus an event seen in its ongoingness). Such scholars as Deutschbein and Garey clearly distinguish the two parameters, but in the recent works by Leech and Macaulay the distinction is obscured by the overworking of a single feature--CON in the case of Leech, PERFECTIVE in the case of Macaulay. This is not to claim, however, that the two sets of categories have nothing in common--they could not have been confused for so long if this were the case. As we shall see, the notion of existential status is the common denominator.

However, although Leech appears to treat "perfectivity" by means of the ascriptional feature $+$CON and correlates it with the simple tense forms, he does not treat "imperfectivity" or

\(^1\) Cf. fn. 1, p. 324.
"ongoingness" in what might be the expected fashion, i.e. by the ascriptional feature -COU. Rather, he introduces a new ascription feature for the purposes of accounting for the meaning of the progressive form. Once one scrutinizes the interpretation of this feature, however, it must be conceded that Leech has, in fact, provided no semantic analysis of the progressive form. For although he gives four 'connotations' of the form—namely, "durative", "limited time extension", "incompleteness", and "continuousness"—he then concludes (1969: 151) that "it is the total "gestalt" formed by the bundle of "connotations"...that is represented by the feature [±SITU]". The vacuousness of this as a description of the meaning of a linguistic element should be obvious. One reflection of its inadequacy is that it leaves completely unexplained the fact that the four "connotations" are in complementary distribution: a sentence with the progressive form is not ambiguous or vague in four ways. As we have seen, the notion of incompleteness is associated with conclusive (+COU) predications. Similarly, "duration" (if this is an accurate characterization of the semantic effect) is associated with the progressive form of activity predications and "limited time extension" with those predications on the borderline between states and activities (e.g. 'live', 'wear', 'feel', 'stand', etc.) His "continuous" interpretation is restricted to iterative activity predications involving processes which are repeated without an interruption: the element of continuousness is implied by the predication, not by the progressive form; one is merely saying of a process that is always going on that it is going on at that moment—of sentences 56. and 57., in which the difference in meaning is
slight, with 58. and 59., in which the basic predication involves a process or event which is not repeated without an interruption and in which the difference in meaning is therefore considerable.

56. The earth turns on its axis
57. The earth is turning on its axis
58. John eats his breakfast in bed
59. John is eating his breakfast in bed

Furthermore, the semantic relationship of progressive aspect with state predications cannot be explained by the use of such a feature as + SITU: somehow one must account for the fact that conclusive/telic/4CCU predications in progressive aspect satisfy the criteria for state not event predications.

Independently of both Leech and each other, the contemporaneous studies of Macaulay (1971) and Verkuyl (1972) explore in somewhat greater depth and systematicity the configurational nature of aspectual and zeitcharakter categories. Both treatments are essentially from a syntactic point of view, and both take as their point of departure the generative transformational model as outlined in Chomsky (1965). However, whereas Macaulay stays more or less within the standard theory, extending it only by the incorporation of 'amalgamation rules', which transfer aspectual features from the verb to higher nodes, Verkuyl tends towards a generative semantic framework in his adoption of Gruber's (1965) notion of polycategorial lexical attachment and the subcategorizing of verbs in terms of inherent semantic primitives. His aspectual schemata, which can be compared functionally with Macaulay's amalgamation rules, could be
regarded as rules for the expansion of aspectually specified S-nodes. Generally speaking, Verkuyl's analysis is more 'semantic' than Macaulay's in that semantic rather than syntactic categories are used in his characterization of the different aspectual configurations (which we would term zeitcharakter configurations) and more explanatory in that the content of the schemata themselves are suggestive of why certain configurations of elements should be non-durative (conclusive) and others not. Let us now proceed to an investigation of these two studies in somewhat greater detail.

6.3.4.4 Macaulay's treatment of aspect as a transferred syntactic feature

On the basis of such criteria as co-occurrence with durative adverbials, co-occurrence with the progressive form and some of the semantic tests as set forth by Kenny (1963), Taylor (1965) and Vendler (1967a), Macaulay recognizes one aspectual opposition in English which he formalizes as opposite specifications of the feature PERFECTIVE. This feature, Macaulay argues, is relevant at different levels of constituent structure: verbs may be specified inherently as \( [-\text{PERFECTIVE}] \) or \( [+\text{PERFECTIVE}] \); \( [-\text{PERFECTIVE}] \) underlies the progressive form and \( [+\text{PERFECTIVE}] \) the simple form; verb particles may be \( [-\text{PERFECTIVE}] \); and both specifications may be transferred features on larger constituents. Thus, a verb phrase consisting of a \( [+\text{PERFECTIVE}] \) verb and a \( [-\text{PERFECTIVE}] \) auxiliary takes on the specification of \( [-\text{PERFECTIVE}] \). An inherently \( [-\text{PERFECTIVE}] \) verb plus a \( [+\text{PERFECTIVE}] \) particle (e.g. 'grow up') together constitute a \( [+\text{PERFECTIVE}] \) complex verb. These two
processes are handled by 'syntactic amalgamation rules' which transfer features to higher nodes and which can be schematically represented as in Figure I.

![Figure I]

Macaulay notes that those verbs which are \( \Box\text{STATIV}\) according to Lakoff's (1965) criteria neither accept the progressive form nor combine with perfectivizing particles. These facts he takes as supporting his claim that only a subclass of the set of verbs participate in the \( \Box\text{PERFECTIVE}/\Box\text{PERFECTIVE} \) opposition—those which are \( \Box\text{STATIV}\). As we have seen in § 5.2.8 and in our discussion of Leech above (cf. also Miller's (1970a) analysis of Russian), there is additional evidence that the class of verbs to which aspectual distinctions apply must be restricted. However, as we found, it appears that it is semantically rather than syntactically stative verbs (assuming the distinction to be valid) which are excluded.

For example, if we turn to Macaulay's treatment of the interaction between verbs and their nominal complements, which corresponds to that of Garey (1957) and partially to Leech's (1969) rules of semantic concord, we find the following formulation (Macaulay, 1971: vii): "Inherently \( \Box\text{PERFECTIVE}\) transitive verbs form part of a \( \Box\text{PERFECTIVE}\) predication if the direct object is a singular
[SPECIFIC] noun phrase. For example, eat is inherently [PERFECTIVE] but the verb phrase eat an apple is [PERFECTIVE] if the noun phrase an apple is [SPECIFIC]. ¹ The amalgamation rule for this interaction is represented as in Figure II. Now, as we have seen there are many transitive [STATIVE] verbs which would be [PERFECTIVE] (since all non-stative verbs are in Macaulay's system either

![Figure II](image)

Rule 3

+PERFECTIVE or -PERFECTIVE) but which do not participate in this interaction: the predication remains [PERFECTIVE] (as revealed, for example, by its acceptance of durative adverbials) irrespective of the object—cf. the sentences below. Both 60. and 61. can be

60. John attended the lecture for half an hour
61. Mary wore that silly hat all evening
62. Fred watched a documentary on the television for half an hour

plausibly argued to describe states (causative locative ones—"cause oneself to be at", "cause oneself to have on") and possibly 61. as well ("cause oneself to see"). This brings into question Macaulay's

¹ Macaulay's interpretation of [SPECIFIC] is uniqueness of reference, i.e., reference to a particular individual: "A singular [SPECIFIC] NP under the present interpretation not only carries the presupposition of the existence of the referrent but also that the referrent is unique" (Macaulay, 1971: 92).
decision to treat \textit{PERFECTIVE} as a syntactic feature only.\footnote{It is because of the fact that \textit{STATIVE} reflects only partially a semantic distinction and because Macaulay fails to observe that the \textit{PERFECTIVE}/\textit{IMPERFECTIVE} distinction does not apply to all \textit{-STATIVE} verbs that he decides to view both of these as syntactic contrasts. However, he does remark that he would like to claim that "the essential distinction is not between \textit{PERFECTIVE} and \textit{IMPERFECTIVE} predications but between \textit{EVENTS} (which are momentaneous) and \textit{STATES} (which have duration)" (Macaulay, 1971: 151). This would suggest that Macaulay regards \textit{PERFECTIVE} predications as semantically similar to \textit{STATIVE} predications. He does in fact observe later on that sentences in the progressive aspect and sentences with stative verbs share the property of accepting durative adverbials.}

However, the situation is still more complex, for there are syntactically and semantically non-stative verbs--i.e. verbs of activity--which are also immune to Macaulay's amalgamation rule (Figure II): sentences 63. to 66. are all \textit{\$PERFECTIVE$}

63. Fred walked the dog for several hours
64. The boy pulled the rickshaw all day
65. Mary played the piano all morning
66. John rode his bicycle all afternoon

predications. The problem here lies in the fact that 'direct object' is a surface structure notion--it is a derived grammatical relation--and as long as the amalgamation rules are phrased in terms of such a notion, they will apply only to more or less superficial configurations when what is obviously involved are deeper, more semantic configurations. In both 63. and 64. the superficial direct objects are, at a deeper level of analysis, of the same grammatical or
logical status as the subjects in sentences 67. and 68., respectively.

67. The dog walked for several hours
68. The rickshaw moved behind the boy all day

Both of these are also -PERFECTIVE. Sentences 65. and 66. are somewhat less transparent than the causative structures of 63. and 64. However, we may compare them to 69. and 70., respectively, in which the deep grammatical relations between the verb and each of

69. Mary played tunes/music on the piano all morning
70. John rode around/back and forth on his bicycle all afternoon

'Mary' and 'the piano' or 'John' and 'his bicycle' remain unchanged but a new direct object appears in 69. and a directional complement in 70. Sentence 69. will not conform to Macaulay's amalgamation rule (disregarding for now the inappropriateness of 'direct object' in its formulation) since 'tunes' and 'music' are [-SPECIFIC]. Thus, 'play' in sentence 65. displays the properties of a pseudo-intransitive verb—one for which an unspecified object is implied but not realized. However, unlike such pseudo-intransitives as 'eat' and 'drink', it permits its locative accompaniment to be objectivized.
Sentences like 70, especially their conclusive counterparts (cf. 71), cannot be accommodated within Macaulay's system as he has

71. John rode to the end of the street for five minutes in five minutes

Other examples of locational expressions appearing as direct object are given below, along with corresponding (though not necessarily synonymous) explicitly locative sentences (cf. Anderson, 1971b: 95). The fact that verbs such as 'eat' and

1. a. John planted the garden with apple-trees
   b. John planted apple-trees in his garden

2. a. A statue occupies the plinth
   b. A statue stands on the plinth

'drink' do not, like 'play' and 'ride', allow their locative accompaniment to undergo objectivization—cf. 3, and 4.—can be related to the fact that it is a directional, more specifically a source (or ablative), expression rather than a simple locative which is most intimately associated with the former verbs. Unlike goal (or allative) expressions (cf. the following footnote), source

3. a. John drank something from a pewter mug
   b. John drank a pewter mug

4. a. Mary ate something from the pot
   b. Mary ate the pot

expressions tend to require (except when subject of the verb) an overt marker—either 'from'/'of' (cf. Bennett, 1972) or a 'suppletive' form of the verb (cf. Anderson, 1971b). Examples of this latter are 'steal from'/ 'rob', 'pull weeds out of'/'weed', 'go (away) from'/'leave'. This latter might appear to be an exception since we have both 5. and 6. However there is a rather sharp

5. John left London

6. John left from London

difference in meaning between the two: 6. presupposes that John has already set out on or completed some journey and simply indicates his starting point; 5., on the other hand itself describes an undertaken journey, admittedly of a minimal kind ('from London to not-London') and could be followed by a 'from' phrase like that of 6.:

7. John left London from Heathrow
made no provision for the perfectivizing property of directional adverbials of the kind 'from...to...' (as is done explicitly by Verkuyl, as we shall see). ¹ (Macaulay does mention directional adverbials in passing, suggesting that they have much in common with the class of verb particles.) Returning now to sentence 66, we can suggest that its imperfective nature is due not to an underlying unspecified object but rather an underlying unspecified directional complement (cf. 'somewhere', 'about') or one implying a continuously

¹ It is worthwhile in this connection to note the observations of Sandmann (1954: 179) concerning the verb 'to fall': "...our foregoing analysis is valuable because it teaches us to expect that a given verb in different specifying contexts may appear to be occasionally perfective, even though it is generally, i.e. outside a context, imperfective. If we say, for instance, He falls from the roof, it is obvious that we refer to the initial phase and the verb is perfective. In He falls to the ground we refer to the final stage, and we have again a perfective verb. But in The parachutist falls so many feet per second, to fall is imperfective. If we look at our examples we find that the characteristic keywords for the perfective interpretation are from and to." He then goes on to suggest that these particles may be "felt to belong to the verb itself" in which case the verb is inherently perfective.
extendable or repeatable movement (cf. 'around', 'back and forth').

There are many other troublesome sentences with verbs which superficially are followed by a singular specific noun phrase but which are not perfective or may be construed either imperfectively or terminally (as reflected by the possibility of taking either a durational or an expending time adverbial). Some of these are given below. These demonstrate further that Macaulay's amalgamation

72. John read this evening's newspaper in/for an hour
73. Mary weeded the garden in/for an hour this morning
74. Mary kneaded the bread in/for five minutes
75. Mary stirred the soup in/for five minutes
76. Fred sanded the floor in/for several hours
77. Fred planed the board in/for several minutes
78. Sally rubbed her cheek in/for a few seconds

We may note incidentally that such sentences as 70, and 71, share certain more superficial syntactic properties with dative and benefactive constructions, for we may also have the variant in 1. below

1. John rode his bicycle around/back and forth/to the end of the street
   as well as that of 66. Cf. 1., 70., 71.; and 64. with the sets in 2. and 3. below. However, whereas the superficial direct
   2. a. John sold the piano to Mary
       b. John sold Mary the book
       c. John sold the book
   3. a. John bought the book for Mary
       b. John bought Mary the book
       c. John bought the book

object in 1. can be omitted, this is not generally possible in the case of the dative and benefactive constructions of 2.a. and 3.a.—cf. 1.a., 2.d. and 3.d. below. This is presumably related to the

1. a. John rode around/back and forth/to the end of the street
2. d. John sold to Mary
3. d. John bought for Mary

fact that in 2.a. and 3.a. the direct object is semantically the one 'moving' whereas in 1. both the subject and the direct object are involved in (simultaneous) movement and hence the omission of one of them does not leave the described situation without one of its essential 'actants'.

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1 We may note incidentally that such sentences as 70, and 71, share certain more superficial syntactic properties with dative and benefactive constructions, for we may also have the variant in 1. below.
rule is not sufficiently sensitive to deeper grammatical relations.

Let us now turn to the two other amalgamation rules proposed by Macaulay. First, Macaulay accommodates observations made by Klima (1964) and Fillmore (1969), concerning the effect of negation on co-occurrence restrictions between perfective verbs and durative adverbials (cf. § 5.2.4.) by means of the amalgamation rule represented in Figure III. Negation is treated as an operator over a sentence.

Figure III

\[ \text{NEG} \rightarrow \text{PERF} \]

Rule 4

The remaining amalgamation rule is meant to account for the imperfectivity of predications with inherently \( \text{PERFECTIVE} \) verbs and \( \text{SPECIFIC} \) subjects, as in sentence 79. The rule is

79. *Guests arrived until midnight*

Figure IV

\[ \text{NP} \rightarrow \text{VP} \rightarrow \text{PERF} \]

Rule 5

schematically represented in Figure IV. Here again we meet the disadvantage of trying to characterize these processes in terms of derived grammatical relations such as subject and direct object. Intuitively, the generalizations formulated in rule (3) and rule (5)
are the same—cf. sentences 80. and 81.—and this is simply a reflection of the ergative relationship holding between such pairs of

80. a. John delivered the notice to quit all day

b. John delivered notices to quit all day

81. a. The notice to quit arrived all day

b. Notices to quit arrived all day

transitive and intransitive constructions (cf. our discussion of Kenny in §6.2.3). Thus, the amalgamation rules must be formulated in terms of the deep grammatical relations not only if they are to work properly, but also if they are to capture such generalizations.

A more general problem, however, is that there appears to be no restriction on the number or form of such amalgamation rules in the grammar. For example, unless some general principle exists to the effect that SPECIFIC has no effect on PERFECTIVE, SPECIFIC

no effect on PERFECTIVE, etc., then there would have to be at least six additional rules to account for the combinations of elements which 'acaulay did not explicitly consider. These are given in Figure V.
Furthermore, had he investigated the role of directional adverbials, and perhaps other data, still other rules would be required. And, if one looks at rules (1) to (5), there is no common formal property to be found. Such a proliferation of formally distinct rules makes one wonder if some generalizations are not being missed. Recall, for instance, our discussion of the underlying identity of rules (3).

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Vacauly claims that the sentence John bought apples is \( +\text{PERFECTIVE} \). We disagree with Vacauly and feel his confusion may be due to his attempt to do too much with one feature opposition—recall our discussion of Leech's overworking of \( +\text{CVU} \). Throughout, Vacauly equivocates in his intended interpretation of \( +\text{PERFECTIVE} \) as between that of non-conclusive and that of ongoingness and, in the case of \( +\text{PERFECTIVE} \), between that of conclusive and completeness. However, even granting his assignment in this amalgamation rule, we are left with a rather undesirable situation: when \( +\text{PERFECTIVE} \) (i.e., the element of \( +\text{AUXILIARY} \) realized as the progressive form or as zero) is \( +\text{PERFECTIVE} \), then it is dominant, making the VP \( -\text{PERFECTIVE} \); when it is \( +\text{PERFECTIVE} \), it is the V's specification which is dominant.
and (5). Similarly, we may ask what \( \text{PERFECTIVE} \) (as underlying the progressive form) and \( \text{NEG} \) have in common that they should both have an imperfectivizing effect, and why one but not the other should be allowed to co-occur with \( \text{STATIVE} \) predications.

Before leaving Macaulay's framework, we must comment on his treatment of Vendler's accomplishment and achievement verbs. Accomplishment constructions are, in Macaulay's system (as in Dowty's—cf. \( \S \) 6.3.4.6), analyzed as complex and conforming to his amalgamation rule (3) in their internal structure. In words, accomplishment verbs are "a particular use of "activity"verbs. Since "activity" verbs are \( \text{PERFECTIVE} \) the effect of a singular \( \text{SPECIFIC} \) NP as direct object is to make the verb \( \text{PERFECTIVE} \)" (Macaulay, 1971: 122). Achievement verbs, on the other hand, are "certain intransitive verbs or ... transitive verbs with singular \( \text{SPECIFIC} \) NPs as direct object" (ibid.: 116). That is, they are either inherently \( \text{PERFECTIVE} \) intransitive verbs or they are constructions conforming to the same amalgamation rule as accomplishment verbs. Macaulay then does a curious thing. He ignores the class of accomplishments which, though perfective, are duratively so (in Streitberg's sense) and associates with the specification \( \text{PERFECTIVE} \) the interpretation that the event referred to takes place at an instant of time (Macaulay, 1971: 126; cf. also fn. 1, p. 331). Although as Macaulay himself observes, accomplishments are of the same grammatical structure as one class of achievement constructions, it is not the case that they both have the same temporal structure (despite their being both \( \text{PERFECTIVE} \)) and this must be allowed for and accounted
for—cf. sentences 82, and 83. Again, it would seem that an attempt

\begin{enumerate}
\item a. The pilot was entering the cockpit all the while the passengers were boarding the plane
\item b. The gas was entering the cockpit all the while the passengers were boarding the plane
\end{enumerate}

\begin{enumerate}
\item a. Fred has been losing his umbrella for three hours
\item b. Fred has been losing his memory for several years
\end{enumerate}

to account for too much with one feature has caused important distinctions to be obscured.

6.3.4.5 Verkuyl's compositional analysis of the aspects

Verkuyl's treatment of the kinds of phenomena dealt with by Macaulay and those others we have discussed is based on data from Dutch. However, he has throughout given the English equivalents, and the striking similarity between the two languages makes it possible to carry over his conclusions and framework to that of English. The range of sentence types to which Verkuyl gives detailed attention is more comprehensive than that found in the previous studies we have looked at; and, although the point of view is essentially syntactic, his analyses of these various sentence types are very suggestive of underlying semantic regularities. Unfortunately, the fact that Verkuyl too confines himself to the grammatical relations of subject, direct object and indirect object has, in many cases, obscured his insights and prevented him from capturing the relevant generalization. Thus, for example, he also misses the common principle underlying the durative (non-conclusive) nature of sentences 84.a and 85.a, compared with the non-durative (conclusive) nature of sentences 84.b and 85.b.
84. a. Water seeped into the cave all night
   b. A pint of water seeped into the cave all night
85. a. Mike drank beer all evening
   b. Mike drank a pint of beer all evening

However, let us look briefly at the details of Verkuyl’s analysis and how it differs from Macaulay’s. First of all, Verkuyl’s aspectual categories, although syntactically motivated (in general, by considerations of the co-occurrence of temporal adverbials), are also considered to be directly interpretable semantically. He recognizes one major aspectual distinction—DURATIVE versus NON-DURATIVE—the former permitting a single-event reading of the sentence when co-occurring with durational adverbials, the latter, if acceptable, requiring an iterative reading in the same context. Thus, the second sentence below can only be understood as describing several

86. John walked for two hours
87. John walked to the beach for two hours

journeys to the beach within the two hours; hence, it expresses NON-DURATIVE aspect. Within the NON-DURATIVE category, Verkuyl recognizes a secondary distinction of TERMINATIVE versus MOMENTANEOUS which “can be characterized semantically by saying that terminative events have duration and that they necessarily terminate; momentaneous events cover one indivisible moment” (Verkuyl, 1972: 6).

Although his characterization of TERMINATIVE aspect is not entirely felicitous (it not being strictly true that a terminative event such as writing a letter must terminate—though it necessarily ceases once the letter exists), his two NON-DURATIVE categories appear to
correspond to Vendler's accomplishment and achievements, respectively, and the total framework to that of the early writers on aspect (cf. Streitberg, Diez, Jespersen, and Deutschbein above) to which he makes explicit reference. A syntactic consequence of the distinction between TERMINATIVE and MOMENTANEOUS aspect—that of co-occurrence versus non-co-occurrence with temporal adverbials such as "in a day"—is mentioned in passing but is not elaborated upon. (However, as was pointed out in our discussion of Vendler in §6.2.5, co-occurrence with expending adverbials is not a reliable test for distinguishing achievements from accomplishments although it is for the major opposition between state/activities and accomplishments/achievements, i.e. between DURATIVE and NON-DURATIVE in Verkuyl's system). The more obvious reflex of MOMENTANEOUS aspect—that of co-occurrence with point of time locative adverbials—is curiously not mentioned.

However, Verkuyl restricts his attention throughout to the major distinction of DURATIVE versus NON-DURATIVE and presents ample evidence for his thesis that these categories "cannot be taken as semantic primitives assigned to verbs" but rather are "applicable to configurations of certain categories generated by the base. The mechanism underlying the composition of the Aspects seems relatively clear: a certain fundamental subcategory of an underlying V is combined with a complex set of categories of a nominal nature and pertaining to quantity" (Verkuyl, 1972: 98). We see in this last statement the major difference, to which we made reference earlier, between Verkuyl's approach and that of Macaulay and Leech, one which enables us to progress towards making explicit the semantic
determinants of aspectual categories. Aspects are not viewed as atomic features applicable to both verbs and higher constituents (or as transferrable from one to the other) but as derived or configurational categories depending on the independent semantic properties of verbs plus their nominal complements.

For example, Verkuyl argues that the NON-DURATIVE aspect of sentence 87, in contrast with the DURATIVE aspect of sentence 88, derives from the composition of a verb inherently specified

87. Greta walked a kilometre from the Mint to the dam (for two hours)

88. Greta walked (for two hours)

semantically as MOVEMENT with a prepositional phrase whose semantic structure is ultimately analyzable as SPECIFIED QUANTITY OF DISTANCE MEASURING UNITS. Similarly, the NON-DURATIVE aspect of sentences 89 and 90 have, according to Verkuyl's analysis, underlying structures involving verbs inherently specified as PERFORM and TAKE, and

89. De Machula played Schumann's cello concerto (for two hours)

90. Johnny drank a glass of whisky (for two hours)

direct objects denoting SPECIFIED QUANTITY OF MUSIC and SPECIFIED QUANTITY OF FLUID respectively. With regard to the PERFORM verbs (which also include 'say' and 'hear', among others) Verkuyl suggests that, semantically, the notion of 'mapping' (or 'temporalizing') is relevant here (cf. our discussion of Garey in §6.3.4.1): "Somehow or other we have to express that the meaning of 89 relates closely to the meaning of the expression:

(30j') De Machula caused the abstract linearly structured
object 'Schumann's cello concerto' to be mapped into the
Time-axis.

whereas in the case of hate this linear entity remains
atemporal" (Verkuyl, 1972: 57). This notion of mapping (whether onto
the temporal axis or onto some other entity) has considerable
application in the elucidation and explication of the meanings of
various types of linguistic expressions and we shall have recourse to
it in the following chapters.

Another important class of NON-DURATIVE sentences to which
Verkuyl devotes considerable attention is comprised by what have
been called existential causative constructions, as exemplified in 91.

91. Katinka knitted a Norwegian sweater

Verkuyl recognizes the fundamental problem facing the semantic analysis
of such sentences—that the direct object of the verb refers to an
object which only comes into existence as the result of the activity
described by the whole sentence. He makes some shrewd observations
and suggestions concerning their ultimate semantic analysis, among
the most interesting of which is his claim that it will be composed
essentially of the same semantic primes as those of the non-durative
sentences involving a verb of movement and a directional or measure-
phrase complement. Unfortunately, Verkuyl is not very clear in his
discussion at this point and makes no attempt to make his rather
speculative claim more explicit. As we have already seen in our
discussion of the localist hypothesis (§4.2), the underlying
directional nature of existential causatives has been noted by
previous scholars and given explicit treatment within a syntactic
framework by Anderson (1971b).

From sentences such as 84. above, Verkuyl concludes that the subject of a verb is also a determinant of the aspect of the sentence. And from sentences such as 92. (to which we add the additional examples in 93. and 94.), he concludes that the indirect

92. a. Den Uyl handed out the Labour Party badge to a congressgoes (for an hour)

b. Den Uyl handed out the Labour Party badge to congressgoers (for hours)

93. a. The little boy told the secret to his friend (for hours)

b. The little boy told the secret to friends (for hours)

94. a. The contracting firm built the well-designed apartment building for John (for two years)

b. The contracting firm built the well-designed apartment building for progressive town councils (for two years)

Object also plays a similar role. (All of 92. to 94. involve some notion of mappings from an abstract entity to concrete instantiations of it.) However, the a. and b. sentences differ, we suggest, only in the fact that in the former the same action is directed an indefinite number of times to the same individual whereas in the latter it is directed an indefinite number of times to distinct individuals. It would appear to be simply pragmatic considerations which make the a. sentences less probable than the b. sentences in an iterative interpretation—and they would be unacceptable in a single-event reading, as.
interpretation (and they would be unacceptable in a single-event reading, as would the b. sentences).

These considerations lead Verkuyl to propose the following general schemata for the composition of the two aspects (Verkuyl, 1972: 106):

**DURATIVE ASPECT:**

\[
S \left[ NP_1 \left[ (\text{UNSPECIFIED QUANTITY OF } x)_{NP_1} + VP \left[ \text{VERB} \right]_V \right] + NP_2 \left[ (\text{UNSPECIFIED QUANTITY OF } x)_{NP_2} \right] + NP_3 \left[ (\text{UNSPECIFIED QUANTITY OF } x)_{NP_3} \right] \right] \]

**Conditions:** at least one of the categories \( NP_1, NP_2 \) (or \( QC \)) and \( NP_3 \) must be **UNSPECIFIED**

(\( NP_1 \) is the Subject of \( S \), \( NP_2 \) is a Direct Object, \( QC \) is a Quantifying Complement or a Directional Prep Phrase, and \( NP_3 \) is an Indirect Object.)

**NON-DURATIVE ASPECT:**

\[
S \left[ NP_1 \left[ \text{SPECIFIED QUANTITY OF } x \right]_{NP_1} + VP \left[ \text{VERB} \right]_V \right] + NP_2 \left[ \text{SPECIFIED QUANTITY OF } x \right]_{NP_2} + NP_3 \left[ \text{SPECIFIED QUANTITY OF } x \right]_{NP_3} \right] \]

**Conditions:**

(i) **VERB** must stand for subcategorial nodes...such as MOVE, PERFORM, TAKE, ADD TO, CHANGE, DO, etc.

(ii) Does not apply to negative sentences.

Several comments are in order here. First of all, Verkuyl does
not make entirely explicit the fact that verbs participating in
the description of states of affairs cannot enter into the NON-
DURATIVE schema although his scattered comments and observations
(cf. his remark about the verb 'hate' above) point to this conclusion.
However, state verbs are no longer a problem in Verkuyl's system
since DURATIVE/Non-DURATIVE does not apply to verbs themselves, but
only to configurations involving verbs along with their complements.
Hence, there is no difficulty in accounting for the fact that sen-
tences with state verbs fit the DURATIVE schema (i.e. they co-occur
with durative adverbials): the subcategorial node STATE will simply
not be included in the set which is required by the NON-DURATIVE
schema.

This, however, raises the general problem of the apparently
unconstrained nature of the set of such subcategorial nodes.
Although Verkuyl does suggest some relationship between MOVE-ENT,
PERFORM, ADD TO, and TAKE (FROM), this is done in a very unsystematic
and informal fashion and, in general, he does not suggest any way of
characterizing the class of such categories in a principled fashion.
An analysis which would allow one to restrict the possible membership
of this class in a natural way would thus be preferred.

Verkuyl's configuration (UN)SPECIFIED QUANTITY OF X corresponds
in part to Allen's (1966) '(non-)bounded nominals' (cf. 36.3.4.2).
In particular, Verkuyl regards such categories as COUNT, which are
normally assigned to nouns, as analyzable into more elementary semantic
categories scattered over the whole noun phrase. Thus, to take an
example, underlying a count noun phrase such as 'the concerto' is a
structure like that in Figure VI. SPECIFIED QUANTITY is interpreted as "bounded interval of" and Verkuyl suggests that it is such "boundedness" which underlies "countability". Furthermore, it is the presence of COUNT (or rather the categories into which COUNT is analyzable) which "accounts for the fact that sentences containing a Nondurative Aspect can express frequency if they also contain Durational Adverbials" (Verkuyl, 1972: 59). The configuration SPECIFIED QUANTITY may also have a separate realization, as in such expressions as 'a piece of music/poetry', 'a slice of bread', 'a glass of beer'. Although we do not wish to get side-tracked into a discussion of 'specificity' in relation to noun phrases, we must point out that Verkuyl's use of (UN)SPECIFIED is not to be equated with Macaulay's use of +SPECIFIC. A specified quantity of something, in Verkuyl's sense, can at the same time be nonspecific in Macaulay's sense as, for example, in the sentences below. Furthermore, Verkuyl's use of (UN)SPECIFIED must not be confused with the use of

95. Mary baked a cake every day last week
96. Fred drinks a glass of wine with his dinner
97. Bill used to smoke a packet of cigarettes a day
'(un)speified' in relation to the implicit object of pseudo-intransitive verbs. Thus, for example, sentence 99. below has, in contrast with 98., a specified object; but this object would be analyzed as an UNSPECIFIED QUANTITY OF FISH. Because of the 98. Jeff is eating 99. Jeff is eating fish likelihood of confusing these three uses of 'specific'/ 'specified', it would have been preferable for Verkuyl to have chosen such a term as 'bounded' instead, especially as this is how he would like to have SPECIFIED interpreted. Still in relation to the schemata above, we may note that Verkuyl recognizes the interplay of negation with his aspectual categories. However, rather than viewing negation as determining the aspect of the configuration as DURATIVE (as is done by Macaulay), he suggests that the negative element neutralizes the aspectual opposition. This interpretation of the interaction arises from considerations of logical equivalences between universal and existential quantification involving negation \[ \sim (\exists x)(f(x)) \equiv (\forall x)(\sim f(x)) \] and such sentences as 100. and 101. below. However, Verkuyl seems 100. During the walk Piet and Teun did not have a discussion about skating 101. Arthur did not stumble over that branch for a week to be confusing two related issues here: the possibility of negated non-durative clauses to co-occur with durational adverbials (as in 101.) and the equivalence between such sentences and the corresponding ones with locational or expansive adverbials ('during...', 'in...'),
as in 102.

102. a. Arthur didn't say a word for ten minutes
    b. Arthur didn't say a word in ten minutes

Finally, we may note that the schemata above make explicit the fact that aspect, as conceived by Verkuyl, is a category of sentential units. This becomes clearer when we consider the use he makes of the schemata in constraining the application of a rule which he calls adverbialization. This transformation, the details of which need not concern us here, transforms the structure underlying sentence 103a below to that of 103b. The transformation can only apply if the sentential structure underlying the subject of 'last a week' conforms to the DURATIVE schema—as is not the case in 103.

However, an iterative interpretation is still possible, and in order to account for this semantic fact, Verkuyl reformulates the restriction such that if adverbialization is to apply to a structure in which the sentential subject of the durational predicate conforms with the NON-DURATIVE schema, then it must also be the case that the sentential subject is plural.

This reformulation leads Verkuyl to seek a characterization of an 'event-unit', i.e. the kinds of sentential structures which may be quantified. This problem intersects with that of determining what the upper bound of the category of aspect is. We cannot go into the detailed syntactic argument which Verkuyl puts forward (based on 'do-so' tests for verb phrase constituency, cleft and
pseudo-cleft constructions), but we may summarize his conclusions as follows (hopefully without too much distortion). The category of aspect is applicable to sentential structures containing, in addition to the verb, only such constituents as direct object, indirect object, prepositional object (e.g. the object of 'wait for'), predicative adjuncts of the direct object (e.g. 'paint the door green'), manner adverbials of product (e.g. 'knit a sweater coarsely'), and place adverbials functioning as complements (e.g. 'spend one's holidays in France'). It is only such constituents which appear to have a bearing on the composition of the durative and non-durative schemata. Verkuyl implies that such constituents form a finite set. (However, those he enumerates represent a strange mixture of semantic and surface structure notions, suggesting that some generalization is being missed.) Such sentential structures represent 'minimal events'. Such events may be expanded by adding other constituents such as manner, reason, concessive, modal, place and time adverbials. None of these, generally speaking, affect the aspectual properties of the sentence as a whole. They can, however, be within the scope of the quantifier.¹

¹ Verkuyl considers the durative adverbials as being outside the scope of the 'minimal event', but we may once more adduce such examples as those below. Like other non-durative constructions,

1. John worked from midnight to 8:00 a.m. for ten years
2. John slept throughout the afternoon all week

these can only be understood iteratively. Cf. our remarks in fn. 1 p. 318.
In conclusion, we may note that since Verkuyl is primarily concerned with Dutch, he is not led to consider the semantic implications of the progressive form in English since Dutch has no really comparable construction. Thus, unlike in the case of Leech and Macaulay, the phenomena which he treats under the label of aspect can, without too much risk of misrepresentation, be regarded as what Jespersen comprehended under the distinction of conclusive/non-conclusive and, more generally, what Deutschbein called zeicharakter. However, Verkuyl has made explicit that these categories do not pertain simply to the lexical properties of verbs but rather to the basic sentential structure of which the verb is only the nucleus.

6.3.4.6 Dowty's semantic analysis of Vendler's categories

The final study on aspect to be discussed in this review is Dowty's (1972) dissertation on the logic of verbal aspect. Although this study appeared the same year as Verkuyl's dissertation, the author had access to a pre-publication copy of the latter. (He does not, however, appear to be aware of Macaulay's dissertation which was also available at that time.) However, Dowty is interested solely in the semantic analysis of aspect, and this conceived as model-theoretic semantics, i.e. the specification of truth conditions for sentences relative to a semantic model. He therefore dismisses rather summarily Verkuyl's contribution (and, it should be noted,
misrepresents it\(^1\) on the grounds that he treats aspect solely as a syntactic phenomenon and concerns himself only with the generation of "all the good sentences without producing any of the bad ones", giving no semantic explanation for why his rules or schemata are able

\(^1\) Dowty represents Verkuyl's DURATIVE and NON-DURATIVE schemata as follows:

\[(40) \begin{array}{l}
\quad \text{VP dur} \quad \begin{array}{c}
\quad \text{V AGENTIVE} \quad + \quad \text{NP INDEF. PL.}\end{array} \\
\end{array}\]

\[(41) \begin{array}{l}
\quad \text{VP dur} \quad \begin{array}{c}
\quad \text{V NON-AGENTIVE} \quad + \quad \text{NP INDEF. PL.}\end{array} \\
\end{array}\]

\[(42) \begin{array}{l}
\quad \text{VP dur} \quad \begin{array}{c}
\quad \text{V NON-AGENTIVE} \quad + \quad \text{NP INDEF. SG.}\end{array} \\
\end{array}\]

\[(43) \begin{array}{l}
\quad \text{VP non-dur} \quad \begin{array}{c}
\quad \text{V AGENTIVE} \quad + \quad \text{NP INDEF. SG.}\end{array} \\
\end{array}\]

\[(44) \begin{array}{l}
\quad \text{VP non-dur} \quad \begin{array}{c}
\quad \text{V AGENTIVE} \quad + \quad \text{NP INDEF. PL.}\end{array} \\
\end{array}\]

He then claims (1972: 33) that "Verkuyl's analysis does absolutely nothing toward explaining why the structure (44) is ungrammatical while the others are not. Using his formalism and categories, it would be just as simple to write a grammar in which (40) or (41) or (42) would be blocked while (44) would be generated. Yet I doubt that there is any language in which this would be the case". This would be a valid criticism if it were in fact the case that (40) to (44) constituted Verkuyl's analysis. However, Verkuyl makes reference to such configurations as those above only once and in the early stages of his argument (p. 54 of the pre-publication version, p. 51 of the 1972 book). He explicitly states that they are provisional in nature and later replaces them with the schemata we presented above. It is nevertheless the case that Verkuyl's analysis is still insufficiently abstract to make transparent the logical properties of the two aspectual categories, but his schemata do capture or, at least, point to the principle which we will be elaborating upon in the following chapters that non-durative or conclusive propositions are such because they involve the bounded directional movement (concrete or abstract) of a bounded entity.
Furthermore, he claims that many of the devices and notions which Verkuyl makes use of in order to account for co-occurrence restrictions would have to re-appear in the semantic component (i.e. in the interpretative component of a Katz and Fodor grammar). This appraisal, as we can now judge, is not totally justified. Although it is true that Verkuyl's orientation derives from syntactic considerations of co-occurrence relations, he is led to investigate in some depth, if only programmatically in some places, the semantic structure of the sentences he deals with. Furthermore, Dowty does not seem to have realized that Verkuyl is, implicitly at least, working within the generative semantics paradigm and that he explicitly treats the categories in his schemata and underlying structures as semantic in nature. Nevertheless, Dowty sets out "to avoid this duplication and syntactic arbitrariness by claiming that the deviant surface structures are derived from logical structures whose truth conditions relative to a semantic model are necessarily contradictory" (ibid.: 34).

Dowty begins by amassing a number of criteria which jointly serve to distinguish four classes of verbs (or sentences or situations—Dowty is not altogether consistent in his usage here) which are essentially congruent with Vendler's classification (of §6.2.5): and, following Vendler, he labels these states, activities, accomplishments and achievements. Most of the criteria involve facts of co-occurrence with temporal adverbials and with the verbs 'stop' and 'finish' and differences in entailments. These have already been discussed in our review of the philosophical tradition, and so we need not go into them again here. However, there is one new
criterion adduced by Dowty to distinguish accomplishment sentences from the other types of sentences. This is the ambiguity introduced into accomplishment sentences, but not into activity or achievement sentences, by the adverb 'almost' (cf. also Dillon, 1973).

Thus, whereas 104. (an activity) and 105. (an achievement) have only one reading each (entailing, respectively, that John did not, in fact, walk and that John did not, in fact, notice the painting), 106.

106. John almost painted a picture

(an accomplishment) has two interpretations. Either John was about to paint a picture but changed his mind before starting, or else he did in fact start work on the picture but did not quite finish it.

Following Morgan (1969), who suggests that the number of ambiguities produced by an adverb such as 'almost' corresponds to the number of different scopes the adverbs can have in the underlying structure of the sentence, Dowty remarks that "this is already an argument that accomplishments are logically complex in a way that activities are not".

States and achievements, according to Dowty, share the property of being non-agentive. They differ only in the fact that achievements include an additional incoative predicate (COME ABOUT) in their underlying representation. Thus, representing agentivity by a higher DO pro-verb and non-agentivity by its absence (as is also done by Verkuyl), the underlying structures for states and achievements are those given in Figure VII. Using von Wright's analysis of
changes in terms of different states at successive moments in time (e.g. not-\(p\) then \(p\)) for the mapping of \(\text{COME ABOUT}\) onto a possible world, Dowty accounts for the unacceptability of achievement verbs with durative adverbials in the following way. Such a mapping leads to a contradiction for at one and the same moment it will be both true and false that a given state is the case. This result rests on the analysis of durative adverbials as involving universal quantification over points in a temporal interval. As we come to a similar conclusion, from a somewhat different starting point, in our analysis of 'border-crossings' in the following chapters, we need not go into the details of Dowty's mapping procedure here.

Activities differ from states in being agentive, hence they have the underlying representation given in Figure VIII. Accomplishments, on the other hand, are analyzed as complex constructions

Figure VIII
involving an activity and an achievement (cf. Macaulay, 1971) as the arguments of a causative predicate (CAUSE). Three types of accomplishments are distinguished: intentionally agentive, unintentionally agentive, and non-agentive. These are represented in Figure IX.

Figure IX

Two further possibilities are suggested by Dowty. First, he points out that a causal relationship may hold between states as well as between activities and achievements. Sentence 106. illustrates such a construction, for which the underlying representation is given in Figure X. Secondly, he also suggests the possible need for a
category of 'basic actions' which are agentive achievements (or, in other words, accomplishments with no 'activity' cause other than the 'will' of the agent). These would account for sentences denoting "outward manifestations of human voluntary behavior" (Dowty, 1972: 119) such as 107. and 108. below. These are certainly agentive by

107. John opened his eyes
108. John raised his left hand

the usual linguistic tests (but cf. Cruse's (1973) useful discussion on 'agentivity' and the presence of 'do'). A proposed structure for these is that given in Figure XI.

Figure XI

Most of Dowty's discussion concerns itself with syntactic and semantic motivation of the atomic predicates DO and CAUSE and the truth conditions of this latter. These elements or their equivalents are no doubt important in an eventual analysis of the structure of different sentence types. However, they are not that relevant to the elucidation of the temporal and aspectual properties of sentences
with which we are concerned, and we therefore will not go into the
details of Dowty's treatment. It is the temporal and aspectual
structure of the different classes of verbs or sentences which Dowty
strangely seems to ignore. Although he accounts in an insightful
way for the non-occurrence of durative adverbials with achievements,
he does not account for the possibility that both achievements and
accomplishments occur with expending adverbials ('in so much time')
while activities and states do not. Nor does he treat the semant-
ics of such adverbials, nor the fact that achievement verbs occur
with point of time adverbials whereas accomplishments are 'extendable'
or 'shrinkable', occurring either with 'in' or with 'at'. Furthermore,
he does not account for the co-occurrence or interpretation
potential of 'finish', 'stop', and 'begin', all of which cannot
coop-ccur with achievements and only the first of which can co-occur
with accomplishments. Yet these are all the very facts by which he
distinguished the four categories of verbs and those for which one
would expect an explanation.

Of more importance perhaps is the fact that Dowty has restricted
his attention to a small set of sentence types within each category,
and it is not obvious from his analysis of accomplishments, for
example, how he will accommodate some of the sentence types discussed
by Verkuyl. That is, he has made 'change of state' the basic feature
both of achievements and accomplishments; but it is difficult to see
the change of state involved (at least in such simplistic terms as
his representations would suggest) in the situations denoted by the
following sentences. Rather, Verkuyl's generalization in terms of
109. Fred read the book
110. Mary played the concerto
111. Sally recited the poem
112. Tom walked a mile

'mapping' or 'temporalizing' a bounded object, or as we will propose, the (concrete or abstract) journeying or series of journeyings from the beginning to the end of an object, would appear to be more relevant here.

Before concluding our discussion of Dowty's study, we must mention his treatment of the semantics of the progressive form. First of all, Dowty suggests at least two sources for the progressive form. The atomic predicate DO above a state is responsible for the progressive form in such sentences as 113. below. However, Dowty

113. John is being polite
     careful
     nosy

is here suggesting that the progressive form, which realizes the higher DO, can be correlated with the non-stative interpretation of such sentences, more particularly, with the semantic elements of "volition, temporariness and...immediate controllability" (Dowty, 1972: 67). This cannot be so since the same non-stative interpretation can be sustained in sentences without the progressive form, as in 114. Thus, although a higher DO may be required on both semantic

114. John was polite
careful
nosy

and syntactic grounds to account for the non-stative interpretation
of such adjectives, it is not the case that 'be -ing' is its realization.

The second source for the progressive form proposed by Dowty (following Ross (1969)) is that of an underlying BE. Although he does not say so explicitly, Dowty appears to regard this as the source of 'be -ing' in activity and accomplishment sentences though not in achievement-sentences. Dowty suggests the following semantic value for BE:

(78) BE(S) is true at t iff ( t' : t' is an interval of time & t ⊆ t') ⊨(S in t')

(78) states that BE(S) is true at some time t if t is a member of some larger interval of time t' in which it is possible that S (e.g., if S is a COME ABOUT sentence, then a change of state possibly comes about in the indefinite larger interval t').

(Dowty, 1972: 133)

Dowty admits the ad hoc nature of (78) and also is aware of the problem of ensuring that t is not the last moment in t'. However, there is a more serious problem with (78): it could assign a positive truth value to sentence 115, for example, even if the latter

115. John was writing the letter at noon had been finished (just) before noon.1 Furthermore, Dowty is equivocating in his use of S in the above truth condition: in the first

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half $S$ stands for the whole structure underlying an accomplishment whereas in the second half it stands for only that part corresponding to the change of state. In addition, his use of *in* (as in $(S \text{ in } t')$) is not defined or explained. These comments should be sufficient to establish the inadequacy of Dowty's analysis of progressive aspect. Furthermore, as we have suggested above, the troublesome implications of accomplishments in progressive aspect can be accounted for by much more general principles and need not force one to abandon the possibility of a uniform or unitary semantic analysis of the progressive form.

6.4. Conclusion

It should now be apparent the degree to which the logico-philosophical discussion of states, actions, events, changes, achievements, etc. intersects with the past century of linguistic scholarship in the field of aspect, aktionsarten, and verb classes. The philosophers have been concerned, most particularly, with the phenomena which Deutschbein described as the zeitcharakter of the verb: recall, for instance, that Vendler viewed his categories as corresponding to the different ways in which verbs "presuppose and involve the notion of time". However, what has emerged from such linguistic studies as those by Garey, Leech, Macaulay and Verkuyl is that these categories belong not to verbs but to sentential units. Deutschbein's notion of zeitcharakter so generalized is what we shall mean by (temporally-structured) proposition types. These could also be viewed as linguistically relevant situation types. As the past discussion has revealed, there is a large number of
syntactic and semantic facts which demonstrate that different types of propositions must be recognized and accounted for if one wishes to give an adequate description of the semantics of temporal expressions. Although in principle one would like to be able to incorporate and explain all the criteria for and properties of the various proposition types that have been adduced by philosophers and linguists alike; the limits of the present study will allow us only to treat what we consider some of the more central of these. However, we believe that the framework to be developed in the following chapters will eventually be able to accommodate most, if not all, of the data we have amassed in this and the preceding chapters.

We should like to adopt, in a not too rigorous fashion, the tripartite distinction suggested by Deutschbein between aspect, aktionsart and zeicharakter (i.e. proposition type). In particular, we feel that the categories of aspect (e.g. imperfective/perfective) should not be confused with the aktionsarten (e.g. ingressive/egressive/terminative/continuative) nor either of these with the proposition types (e.g. state/activity/accomplishment/achievement). This is not to deny that the latter two, at least, have an intimate connection insofar as, for example, the inception, cessation or termination of a situation are all achievements (cf. our remarks in § 6.3.3 with respect to Deutschbein's confusion over the two categories). Generally speaking, as a heuristic for the following chapters, we may consider a (temporally-structured) proposition as corresponding to the extralinguistic situation being described.
This may be simple, having no temporal structure, such as is the case of states, or it may be complex in its structure, such as in the case of an accomplishment. The verbs of aktionsarten, on the other hand, say something about the 'life' of the situation.

Continuing the metaphor for a moment, we may say that they identify such milestones as the birth of the situation, its death, the realization of its 'telos', and, less dramatically, its simple persistence. Aspect forms, such as that of the progressive, also comment on the life of the described situation but in a fashion that may be described as static in comparison to that of the aktionsarten (cf. Anderson, 1972: § IV). Whereas the aktionsarten have to do with the progression of the situation through its life, the aspects are simply concerned with whether the situation is in fact 'alive' or whether it is already 'dead' or not yet 'born'.

In less figurative words, aspect and aktionsarten have to do with the existential status and progression of the described situation.

However, when we look at the internal structure of the complex proposition types, we will find that their constituent parts also involve such notions as inception, cessation, termination, persistence, simple existence (and, if we may extend the metaphor somewhat, the serial 'incarnation' of the same situation). That is, their internal structure involves an existential as well as a temporal dimension. Hence, what relates all of these three categories to each other is the notion of existence as applied to situations.

We may on occasion, therefore, use the term 'aspectual' in the more general sense of 'existential', especially when we are talking about expressions which do not fall neatly within one of the three
categories. For example, we have already noted earlier (§ 5.2.1) the existence of a set of 'aspectual' adverbs ('already', 'still', 'yet', 'anymore', 'until') and, in §5.2.2, the fact that some uses of the inclusive tense have 'aspectual' implications.