Chapter I

Introduction

This work is an investigation in what may be termed the philosophy of linguistics. The concern here is on two central and integrally related issues of linguistic metatheory, as these have been set forth within generative grammar and certain currents in American structural linguistics, both prior and subsequent to the tremendously influential advent of the former. These are: What is the nature and character of language structure? and, How are grammars, theories of the structure of particular languages, to be justified? On what basis may a principled choice be made among competing grammars, each attributing a different structure to a language?

That the issue of the justification of linguistic theories cannot be disassociated from views regarding the nature of language, or the character of language structure, suggests a continuing reverberation, in modern dress, of two ancient dichotomous perspectives on language: Is language 'natural' or is it 'arbitrary' and 'conventional'? Secondly, Can language be warrantedly analyzed as comprising two distinct realms of <u>form</u> and <u>meaning</u> and the relations between them? The natural/conventional antithesis, e.g., as considered in the <u>Cratylus</u> (with respect to names and the naming relation),[1] may, in one form, be said to recur in the modern period in the guise of a query, extending through the 19th and 20th centuries, concerning the status of linguistics as a science. Intersecting with the meta-

[1] See Rijlaarsdam (1978) for an attempt to trace the ramifications of this Platonic dialogue on Saussure's linguistic metatheory.

methodological Naturwissenschaften/Geisteswissenschaften conflict, linguists, anthropologists, psychologists and philosophers have asked whether linguistics is to be included among the natural sciences, like biology, or among the social sciences, like psychology (?), anthropology, or sociology, and even whether linguistics is an "autonomous" science with its own concepts, methods, and results, or merely an adjunct of one or more of the major sciences. There is, however, one aspect of this question concerning the disciplinary standing or affiliation of linguistics that pertains more directly to linguistic metatheory; this concerns the extent to which language structure is held to be primarily a matter of biological (e.g., genetic) determination. Accordingly, the ancient 'natural' vs. 'conventional' dispute may be said to have a contemporary counterpart in the on-going controversy regarding the hypothesis, put forward most notably by Chomsky, of a genetically based "Universal Grammar", a highly specific a priori ("biologically necessary") schema that sharply restricts the type of grammar that a child may 'acquire', given his particular linguistic experience. For proponents of the 'natural' or 'inherent' view and those of the biological determination one characteristically adhere^s to some version of the doctrine that the primary purpose (or, indeed, result) of the study of language is to reveal fundamental truths about an 'inner', 'mental', or 'underlying' reality, whether a substratum of essences or "components of mind". Both give voice to the rationalist preference

for explanatory accounts positing a "more perfect" reality underlying the confusing appearance of the multitudinous diversities of language and linguistic behavior. Of course, talk about genetic endowment is certainly not interchangeable, at least prima facie, with talk of inherent essences. But both do seek to situate the locus of fundamental language structure outside the realms of history, culture, and society, realms usually considered as variable and 'arbitrary'.

A perhaps more direct connection may be established between the ancient dichotomy of form and meaning and structuralist and generativist metatheory. The initial steps in systematically formalizing (i.e., rendering explicit) language description were taken, in the modern period, in historical and comparative linguistics.[1] It is no accident that Saussure, one of the founders of structural linguistics, was a celebrated Indoeuropeanist. And the structuralist insistence on defining linguistic elements as forms on the basis of their internal relations (in terms of what Engler (1974) refers to as "reciprocal differentiation"), found a congenial ally in the descriptive practices of anthropological linguistics in the United States, whose primary figure, Franz Boas, repeatedly enjoined against couching descriptions of Amerindian languages in a Procrustean bed of categories uncritically inherited from ancient Greek and Latin grammarians. For structural linguistics

[1] See Hoenigswald (1960), (1973) and the references cited there.

the first unqualified success was the concept of the phoneme. It was, above all, Boas' student, Edward Sapir, who insisted, in his foundational paper on the phoneme, that phonemes could only be defined as based upon the native speaker's "intuitive 'placing' of the sounds (of his language) with reference to one another" and not, e.g., according to some a priori scale of the purely physical properties of sound. [1] The very objectivity of the elements set up to describe the sounds of a language was, so it ironically seemed, reliant upon a native speaker's "intuitions", in particular, his perceptible discriminations of 'sameness' or 'difference'. Bloomfield, the other major figure in the first generation of American structural linguistics, stressed that intersubjectivity of result required that definitions of meaning were to be left to the special sciences; the linguist's use of meaning was, in general, to be limited to relating utterances to the observable circumstances in which they are made, e.g., the determination of which utterances could be considered to be repetitions depended in part on such correlations. Among the second generation of American structural linguists, it was predominately Harris who, building on the work of Sapir and Bloomfield, sought to extend the "phonemic principle" to 'higher' and 'higher' levels of linguistic elements. Harris, under a methodological approach termed "distributionalism", proposed a generalization of the principle of identification of linguistic elements in terms of their relations with one another: linguistic elements could be

[1] (1925:35-6).

set up according to their distinct environments of occurrence (in Bloomfield's expression, their "priviledges of occurrence"). Much misunderstood at the time, and subsequently, Harris' distributional procedures were often envisaged as seeking to eliminate any considerations of meaning from linguistic analysis, and even as proposing to replace the "ingenuity" of the linguist.

The relational identification of phonemes (by perceptual contrast) and morphemes (by distribution) is rendered feasible by the fact that in each case, the linguist is dealing with a relatively limited number of elements for each particular language: a few dozen phonemes, perhaps a few thousand morphemes. But the task of describing the sentences of a language -- taken as phoneme or morpheme sequences -- seems of a different order of complexity, for here one confronts an immense, indeed, theoretically infinite, class of elements. It was not until around 1950 that the conception of a grammar as a theory of the sentences of a language acquired currency in linguistics, [1] in large measure due to the influence of the rapid development of mathematical logic in the first half of the century. [2] In the specification of rules for recursively defining

[1] Harris (1951a:372-3); ms. completed in January, 1947. This passage, discussed below in Chapter 2 §6 and Chapter 5 §3, is often cited (e.g., Gross (1972:5) as the first indication of this direction of research in theoretical linguistics. It is interesting to observe that as late as 1946, Harris deemed it necessary to offer an apology for the employment of algebraic methods in linguistic analysis:

> In view of the fact that methods as mathematical as the one proposed here have not yet become accepted in linguistics, some apology is due for introducing this procedure (1946:122-3 fn 1).

[2] Among the first suggestions from logicians of the applicability of mathematical logic to natural language are Rosenbloom (1950), Chapter 4, and Quine (1951); also influential were Carnap (1937b) and the work of Leśniewski on grammatical categories, as reported in Ajdukiewicz (1935).

well-formed expressions and rules of proof permitting the derivation of certain well-formed expressions from others, mathematical logic furnished a promising model for linguists who incorporated both the aim of devising effective procedures for determining whether word sequences of arbitrary length and complexity were well-formed sentences of a language and that of showing how certain sentences may be related to others via a derivational procedure. The provision of such rules, it was widely maintained, would thus be a means of exhibiting what could be termed 'the structure' of a language, where a language is now conceived as an in principle infinite set of sentences. It is in proposing the general form of a solution to the problem facing the grammarian, in the words of Quine, that of accounting for what could be in the language on the basis of what is observed to be in the language, that the influence of mathematical logic has been paramount.

The problem of the justification of grammars is accordingly bound up intrinsically with the problem of "projection". However, since the set of sentences of a language can be neither anteriorly nor independently demarcated, it is not obvious what can serve as a criterion of grammarical success. One widely-emulated reply has been to urge that such a grammar of the sentences of a language reconstructs, in explicit terms, a native speaker's "intuitive sense of grammaticalness", thus again tying the objectivity of the elements and operations upon these defined in a grammar to some domain of discriminative behavior evidenced by speakers of a language. A grammar purporting to specify 'all and only' the sentences of a language may thus be considered

to be a theory of linguistic intuition in more or less the same sense that a system of phonemes can lay claim to being a theory of the intuitive perception of sameness or difference of sounds. Yet fundamental questions remain. Are the linguistic intuitions of the speaker intuitions of a linguistic form apart from content or meaning? And what is meant by "form" and "content" or "meaning"? Can linguistic intuitions be reconstructed in a theory which has no semantic terms among its primitives? And, even if answers to these questions are provided, still more perplexing difficulties remain. Because of the often unclear and conflicting character of empirical data attesting to the native speaker's intuitions, this data may not be decisive in guiding a choice among competing grammatical proposals. And, in any case, how can such data provide a basis for selecting a grammar which is considered to be a theory of an infinite set of sentences? Under these circumstances, how can a principled choice be made among competing grammars, each attributing a different structure of a language?

Originating in structural linguistics and in the context of Quine's influential attack on 'the theory of meaning', generative grammar has given a set of answers to these questions which to many have seemed quite persuasive, if only because of the perceptible absence of a clearly formulated alternative. Starting from its first formulation, generative grammar has maintained that grammars are theories of "intuitions of linguistic form" to which notions of meaning are quite literally irrelevant. Since grammars are thus

formal theories, having no semantic terms among their primitives, generative grammar has maintained, until quite recently, that the choice of a 'best' grammar from among empirically indistinguishable [1] grammars is also to be a purely formal matter. Justification is therefore, in part, the province of a formal metagrammar, a general theory of language structure, which constrains the notion of 'grammar' and, in principle, incorporates a mechanical procedure by means of which a highest valued (in terms of the algorithm of selection) grammar is determined. The development of such a metagrammar proceeds hand in hand with the construction of grammars of particular languages. Within a few years, Chomsky argued that such a conception of language structure could be taken as an explanatory hypothesis concerning the mechanism responsible for a child's acquisition of a first language. More recently, the implications of these views are clearly drawn. Linguistics is properly part of biology, eventually to disappear as a separate science altogether as new kinds of evidence, directly bearing on the nature of the posited biological endowment for language becomes available. Linguistic theories -- grammars constrained by the highly specific principles of this biological endowment, "Universal Grammar", -- are "internally represented" in the "mind/brain" of the language user. Grammars, now termed "internalized languages", are "real world objects situated in

[1] I.e., "externally adequate" or "descriptively adequate"; see Chapters 3 and 4.

space-time and entering into causal relations with other objects". The regularity and pattering of language is, in an interesting -- indeed, uniquely interesting -- sense, determined by the biological endowment for language of the human species. Talk about language structure is therefore talk about these genetically constrained real world objects, for which alone a truth claim can be made. On the other hand, under a non-biological conception of structure, no truth claims are advanced, and linguistic data are merely arranged according to one or another conventional purpose. Moreover, in so far as a claim is made concerning the correctness of a theory of language structure, it is to be understood, perhaps against the declared intentions of the issuers of such claims, as pertaining to the child's initial endowment for language. A 'best' grammar is to be selected by constraining the class of grammars compatible with the "primary linguistic data" of the child's ambient linguistic experience. Methodologically, the principles of Universal Grammar are to be determined through the examination of "sample data" in various languages which are accounted explained according to whether they are in agreement with a particular rule or principle constrained in the specified manner -- in which case the rule or principle is held to be part of the "attained mental state" of the competent language user.

This account has served as the focus of a large, vocal, and continuing controversy, argued on many levels and with various degrees of coherence. As a result, much discussion of linguistic metatheory

has been and remains oriented around it. To fix ideas and to set the stage for posing an alternative conception of language structure and the justification of grammars, we will, in what follows, continue this practice. Chapter 3 §3 and Chapter 4 of this thesis constitute an extended argument against generative grammar. However, because of the relatively underdeveloped state of the historiography of American linguistics in the period under discussion, and, as well, out of a general conviction that a doctrine is best scrutinized by situating it within a particular context of origin, Chapter 2 and Chapter 3 §2 examine the immediate background of generative grammar, in the discussions of linguistic metatheory of structural linguistics and in certain philosophical views concerning linguistic methodology and the role of simplicity in theory construction and choice. Our perception is that there has been a failure to define, or to obtain requisite clarity about, certain foundational issues in linguistic theory, in large measure due to a misconception of alternatives. The purpose, therefore, of the mainly critical and exegetical material of Chapters 2, 3, and 4 is to establish additional motivation for the theory of language structure sketched in Chapter 5 and to provide a basis for considering an application of that theory to a particular sublanguage of a science, outlined in Chapter 6. Chapters 5 and 6 thus reverse direction, turning attention to a reconsideration of the role of meaning, and the use of meaning, in theories of language structure and to the character of justification of linguistic theories.

In general, the historical considerations of Chapters 2 and 3 are intended to cover only certain (mainly metatheoretical) issues within structuralism and the first stages of generative grammar; the further remarks in Chapter 4 regarding Chomsky's subsequent work and other work in generative grammar trace only the broad outlines of this later development, and are certainly not put forward as a full historical treatment, a task outside the scope of this work.

In Chapter 2, based on an examination of some fundamental texts of the period, an understanding emerges of the relation of generative grammar to its structuralist antecedents which is markedly different from the widely reiterated account initiated by partisans of generative grammar. The foundational problems of linguistic metatheory were very much at the forefront of discussions in structural linguistics, contrary to characterizations that label this work "taxonomic". Here also we may see that the blanket attribution to American structuralism of a principle that linguistic form could be identified and studied without regard for meaning, or that the goal of linguistic metatheory was the provision of "mechanical discovery procedures" for grammars of particular languages, are quite without foundation. The prevalence, not only among the succeeding generation of linguists inspired by Chomsky, but also among some European linguists of the same generation as Harris, Bloch, Wells, and Hockett, of what textual evidence reveals to be a misinterpretation of American structuralism has seemed puzzling to some readers of this chapter. After all, if the weight of textual support <u>is</u> so one-sided in favor of the revisionist view pre-

sented here, how in fact did the misperception arise and become the standard view of what American structuralism was about? I have not attempted to provide a satisfactory answer to this query; to do so would require, inter alia, a rather more elaborate historical treatment and, presumably as well, a detailed analysis and understanding of the process of group formation in science, in particular, in social science. In recent years it has become a commonplace to distinguish between what might broadly be termed the 'epistemological' and the 'sociological' aspects of change in science. Much less common are illuminating in-depth studies of how, in particular instances, the lines of a dispute are drawn and how it is that a particular outcome ensues. [1] The story of American linguistics from 1950 to the present seems an especially inviting domain for such a study.

Chapter 3 reviews two proposals concerning the role of meaning in linguistic analysis. The first, that of Quine's essay of 1951 entitled "The Problem of Meaning in Linguistics", provides a context for evaluating the second, Chomsky's The Logical Structure of Linguistic Theory, dated June, 1955, which is the first major programmatic statement of generative grammar. In this work, the doctrine of the "autonomy of syntax" is first argued for on the grounds that semantic notions are literally irrelevant to the determination of grammatical structure. These arguments, 25 years later, are still cited as conclusive, and so our consideration of them has more than purely historical interest. This early work also puts

[1] An example of a study of this kind, treating the case of plate tectonics theory, is Messeri (1985).

forward the proposal that the justification of grammars of particular languages requires the notion of a metagrammar, a general theory of language structure, which, if explicitly formulated, structurally constrains the grammars formulated in accordance with it. Significantly, however, the construction of a metagrammar is conceived as proceeding hand in hand with the construction of grammars of particular languages.

After an initial consideration of the sense in which a linguistic theory or grammar may be said to be a theorectical representation of linguistic capacities, Chapter 4 proceeds to trace the metatheoretical evolution of generative grammar from an initial goal of recursively enumerating the sentences of a language to a more recent phase where "sample data" (sentences) are partitioned according to whether they are explicable by a "core grammar", an attained system of mental representations which results as the "parameters" of the principles of an initially endowed universal grammar are fixed by the linguistic experience of the child language learner. On examination of some representative arguments concerning "sample data", it may be doubted that the "interacting subsystems" view of universal grammar, according to which different components or modules -- some of which exist, in the present theory, in little more than name only -- "interact" to produce the form of the sample data, is amenable to empirical control. Increasingly, the character of justificatory claims rely on a so-called 'plausibility argument' to the effect that a child could not possibly have learned the rule or principle allegedly exhibited in the sample data;

the existence of the rule or principle is therefore held to be due to the innate constraints on the form of grammars which can be acquired by the child language learner. And, as in the initial formulation of generative grammar, the construction of a grammatical metatheory is carried out in tandem with the attempt to grammatically characterize the data of particular languages. But without a comprehensive attempt to describe data in a single language (e.g., by systematically examining large numbers of lexical items) under a closed set of constraints governing grammar construction, metagrammatical proposals concerning principles of "universal grammar" have become inextricably linked to particular data, running the risk that the proposed constraints are only artifacts of that data, i.e., of particular lexical items.

Chapter 5 attempts to show how linguistic meaning, or an important aspect of linguistic meaning, can be assimilated to a 'naturalized' notion of information, which stands opposed to cognate notions that seemingly presuppose or tacitly assume the existence of a "first philosophy". The elements of grammatical description cannot be stipulated, on pain of regress, according to a prior system of categories, i.e., in an external metalanguage whose structure is not itself explicable as that of a natural language. In analogy with the 'phonemic principle', identification of grammatical elements is reliant upon the relation of "recognizable repetition" -- whether a speaker considers two utterances or occurrences of language as repetitions of 'the same' element. Grammars,

in turn, characterize those sequences of elements which can occur as recognizably well-formed, in distinction to those that cannot. A theory of language structure is an explicit theory of the constraints on the grammatical characterization of these restrictions on combinations of elements, or departures from free combinability, which may be termed redundancies of combination. Since the different elements of grammatical description must each 'make a difference', i.e., be recognizably distinct, the grammatical characterization should not contribute to the redundancy it seeks to describe, for example, by differently describing two occurrences of the same element. These twin aspects of redundancy -- of restrictions on combinations of elements which are not eliminable without a recognizable difference, and of uniting under a common description all occurrences that 'say the same' -- suggest that the characterization of language structure is a representation of information. In this regard, the familiar metaphor of language 'carrying' information, with the attendent implication that information is discernible as such, prelinguistically or prerepresentationally, is a misleading relic of the ancient form/meaning dichotomy.

In a recent theory of language structure, due to Harris, linguistic meaning may be reconstructed as predication-created information in terms of three constraints governing word combinations: a partially-ordered predicational word dependence (operator/argument) requirement, a relation of gross differences in likelihood ('expectability') of occurrence of an

operator for the various members of its argument word classes, and a relation of reduction in the phonemic shape of a sentence on grounds that an entering word has a very high likelihood of co-occurrence for words of its argument classes already 'present' in the sentence. Section 3 of Chapter 5 presents a case that a grammar of English constructed in accordance with these constraints can be seen as the culmination of a long series of previous attempts to axiomatically describe the sentences of English, showing how transformations may be reformulated in terms of the entry and reduction system.

Now regarding language structure as a structure of predication-created information, a rather different approach to the justification of grammars is suggested and illustrated in Chapter 6, drawing on prior results obtained by application of the theory surveyed in Chapter 5 to a corpus of texts in a subfield of a science. Exploiting the additional restrictions of word combinations of sentences occurring in connected discourse and, in particular, in the restricted semantic domain of research reports concerning a problem in the formative years of cellular immunology, informational formulas -- particular sentence types and sequences of these -- can be constructed that are in inspectable agreement with the known developments and results in this scientific subfield. The formulas of information comprise, in effect, a 'grammar' of this subfield, demarcating an immunology sublanguage and representing, in a compact and in many ways, quite precise manner, what might reasonably

be termed a 'structure' for this area of a science. In this, the endpoint of our investigations of linguistic method and linguistic metatheory may be to inaugurate a new, but not completely unforeseen,[1] approach to the history and philosophy of science.

[1] Carnap (1937b), Part V "Philosophy and Syntax".