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C. H. VAN SCHOONEVELD

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PRINCIPLES AND METHODS OF CONTEMPORARY STRUCTURAL LINGUISTICS

by

JU. D. APRESJAN

translated by

DINA B. CROCKETT

Stanford University

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FOREWORD

There is an interesting tale about the caliph Omar, the seventh century conqueror. In one of the cities he took, there were many books. The military commander who found them asked the caliph whether to distribute them to the believers, together with the rest of the loot. Omar's answer was: "If the books say what the *Koran* says, then they are useless. If they say other things, then they are harmful. So burn them!"

What calls this tale to mind is the fact that the attitude toward structural linguistics was, for a good many years, very much like that of the caliph Omar toward the books he decided to destroy. New notions of structural linguistics were declared harmful, and all the other premises were dismissed as merely new formulations of long known truths.

A lot of criticism was directed against de Saussure's view of language as a system of relations and against his conception of linguistics as a formal theory studying objects the existence of which is not directly deducible from observable linguistic facts.

These positions of de Saussure's will be explained in detail later on and it will be shown that he was only trying to discover simple and general rules which underlie all linguistic phenomena. For the time being, what should be pointed out is that if de Saussure had not gone beyond the notions and methods which prevailed in linguistics at his time, and if he had not postulated the existence of linguistic forms for which there was no direct evidence in the languages known at that time, he would not have made one of the greatest discoveries in the history of linguistics – the discovery of the laryngeals (for details see pp. 104-107). The existence cf laryngeals in a class of Indo-European roots, postulated

by de Saussure on the basis of strictly theoretical considerations of root structure, was confirmed empirically only after his death, with the discovery and decipherment of the Hittite language.

As for the second argument against structural linguistics, we shall again refer to a historical fact, though of a somewhat different nature. Vostokov's syntactic theory, as is well known, also dealt with the arrangement of words in sentences. He gave rules for the order of the primary sentence components (the subject and predicate groups) as well as for the arrangement of attributive and complementary words within each of the two groups ⟨32⟩.* Similar rules appear in recent syntactic algorithms for automatic text synthesis ⟨13, 64, 124⟩. If these algorithms had nothing new about them except for the terminology, they would have been just as unsuitable for computer programming as Vostokov's rules. What is new is the precision of their language.

The immense significance of precision in the language of science has been most aptly pointed out by Wittgenstein in the profound aphorism at the end of his *Tractatus Logico-Philosophicus* ⟨38⟩: "What cannot be spoken of should be left unsaid". Our intuitive knowledge of the world around us and of ourselves in particular is virtually boundless, yet so far only an insignificant portion of this knowledge has been formulated in the language of exact sciences. In fact, the argument between structuralists and non-structuralists can be reduced to the question whether linguistics can become an exact science or whether the nature of its object is such that it is destined to remain forever a humanitarian discipline.

De Saussure's conception of language and linguistics, the kind of questions it led to, and the emphasis on expressing the knowledge accumulated in linguistics in the language of an exact science are at the core of the structural approach to language. It is the author's hope that the present book will make it possible for the reader to form an independent opinion on the validity of this approach.

* Numbers in single chevrons represent entries in the bibliography at the end of the book. When pertinent, page numbers are given in italics after the reference number. The references are generally listed in chronological order.

The present book is neither a systematic course in structural linguistics nor an introduction to the subject. It is a survey, and its purpose is to introduce the reader to the basic problems and methods of contemporary structural linguistics and to provide the necessary background for reading the professional literature. As it is a survey, the author did not feel obliged to present the subject comprehensively and thus was able to concentrate on the problems which, for one reason or another, seemed to him most worthy of attention. They are mostly problems of morphology, syntax, and semantics.

Perhaps not all the experts on structural linguistics will agree with the author's conception of this discipline. Some may object to the choice of representative topics, others to the choice of representative names. This is perhaps inevitable at a time such as ours, when new sciences develop so rapidly, but the author wishes to emphasize that his interpretation of the term STRUCTURAL LINGUISTICS in the present book is deliberately broad. It has allowed him to treat not only the classical schools known as structural but also the new schools where the structural approach is being further developed.

Part One outlines the history of classical structural linguistics and the different schools within it. Part Two deals with the concept of linguistic model, which is the central concept in contemporary structural linguistics. Parts Three, Four and Five introduce various types of linguistic models.

Most sections end with a description of some specific study illustrating the method described in the given section in application to the resolution of a particular linguistic problem. The reader should not be disturbed by the fact that, side by side with studies by recognized authorities, we also discuss work done by younger scholars. The author firmly believes that the results obtained by some of the younger scholars are quite significant.

The book is popular in the sense that the reader needs no special preparation apart from familiarity with the material of an introductory linguistics course, of the scope of Reformatskij's book, for instance ⟨155⟩. The reader who does not have this kind of

preparation will have to persevere and be industrious, for only careful reading will provide him with the preparation necessary for studying the literature of contemporary structural linguistics.

After the manuscript of the present book had been completed, various studies dealing with structural linguistics and adjacent fields were published by Mel'čuk, B. A. Uspenskij, Šaumjan, Volockaja, Mološnaja and Nikolaeva, Chomsky, Katz and Fodor, Vachek, and others. Dissertations related directly to the subject matter of the present book were defended by Revzin, Zaliznjak, Gladkij, and Padučeva. Unfortunately, these materials could not be properly considered in the text of the book.

The author takes this opportunity to express his sincere gratitude to A. Veržbickaja, E. A. Zemskaja, L. N. Iordanskaja, P. S. Kuznecov, I. A. Mel'čuk, B. V. Suxotin, and R. M. Frumkina for reading the manuscript of this book and for making exceedingly valuable critical comments.

FOREWORD TO THE ENGLISH EDITION

This book was completed in 1964, and it thus covers only literature published up to 1963. The most promising areas and trends in the study of language by structural methods were already obvious at that time, but they have come into full view only in the past five or six years. The development of theoretical linguistics in these years has been unprecedented. The major trends can be summarized as follows.

In the forties and fifties, structural linguists were primarily concerned with objective procedures for learning about the grammar and vocabulary of a language from a corpus of texts. In the best cases this concern materialized in the form of models simulating the linguist's work. These models can perhaps be referred to as models of language decipherment on the basis of textual data.

In the late fifties this problem became secondary, and the primary problem in linguistics became accounting for the competence of a person who knows a language: (1) he is able to determine what is acceptable and what is unacceptable in the language; (2) he is able to extract from a given sentence the linguistic information it contains (the ability to understand, to analyze) and he is able to construct sentences to convey given linguistic information (the ability to speak, to synthesize). The attempt to develop models for the first ability resulted in the emergence of generative grammar, represented most fully in the works of Chomsky and his followers, and the formal study of the second ability resulted in the notion of operational linguistic models, a notion developed chiefly by machine translation theoreticians. The original version of generative transformational grammar was conceived of as a device simulating the ability to distinguish

between grammatically well-formed and grammatically ill-formed sentences (this is the version described in the present book). However, it soon became apparent that what a person knows about the language he speaks is not only its grammar but also the meanings of its words and expressions. No model of language can therefore be considered complete so long as there is no formalization of semantics (the science dealing with the meaning of the linguistic units). Consequently, between the years 1963 and 1966 the original version of generative transformational grammar was totally revised. A new component was incorporated in it — a semantic interpretation device, supplying the 'deep', or semantic structure of sentences (in distinction from the 'surface', syntactic structure). Investigations of the deep structure of language, especially by Postal, Weinreich, Lakoff, Ross, Fillmore, Veržbickaja, and Bierwisch, have added much substance to generative grammar.

The theory of operational linguistic models has developed along similar lines. The first operational linguistic models (machine translation algorithms) did not go beyond analysis and synthesis of the syntactic structure of sentences. Since the early sixties, though, especially following work done at the Cambridge Linguistic Circle in England and at the Machine Translation Laboratories of the Torres Pedagogical Institute of Foreign Languages in Moscow, the goal of constructing models of semantic analysis and synthesis has become the primary one. The central problem of semantic operational models has turned out to be the possibility of expressing a single meaning in multiple ways (in synthesis) and the recognition of externally different utterances as identical in meaning (in analysis). The years from 1964 to 1967 saw the appearance of the first models of this type, linguistically most significant and substantial. It should be noted also that in light of these studies a radical change has taken place in the attitude toward the traditional questions of synonymy; the theory of synonymy now occupies a modest place in the much more general and linguistically more substantial theory of meaning equivalence through transformations.

There is yet another noteworthy development in the linguistic thinking of our times. The models of language decipherment on the basis of textual data, that is, the models which predominated in structural linguistics up to the middle fifties, were designed to produce, ideally, objectively determined inventories of units, unit classes, and rules for combining the units within every level of the structure of language (the levels being the phonological, morphological, and syntactic). Considerably less attention was devoted to transitional phenomena between the three levels. The new approach to language, as represented primarily by the generative and operational models, claims that the levels in the structure of language do not possess the autonomy ascribed to them earlier. Linguistic behaviour has come to be regarded as a consecutive process of transcribing information from one code to another, with the different phases of the process linked to each other by complex dependencies. The implication of this fact for linguistic theory is that in developing a simple and economic method for representing linguistic information which relates to a particular level in the structure of language, one has to bear in mind the whole generative process (analysis and synthesis) and to consider the consequences a given method of representation might have for the other levels. The study of these relationships has led to the establishment of several new linguistic disciplines, first and foremost generative morphonology (Jakobson, Halle, Lightner, Zaliznjak, Mel'čuk, and others). The methods of generative morphonology crystallized only in the middle sixties.

We still have not discussed all the trends, methods, and premises which characterize the progress of structural linguistics in the sixties. To be comprehensive we would have to mention also the premises of positional syntax and dependency theory, both developed by European linguists, Sydney Lamb's stratificational grammar, A. V. Gladkij's work on the theory of generative grammars, the algorithms for multi-variant (multi-path) automatic syntactic analysis, and much more.

It is quite obvious that in a book written in 1963 and 1964 it was impossible to anticipate all the new and profound ramifica-

tions of structural linguistics. The book in its present form presents primarily the structural linguistics of the late fifties and very early sixties, and for a number of reasons the author has decided to retain this orientation in the English edition of the book. Only one section has been added to the present edition, one which did not require a radical change in the organization of the book. It is in Chapter 11 (Part Four), which has been expanded to include a description of the semantic synthesis model developed by two young Soviet linguists, Žolkovskij and Mel'čuk.

This model has been chosen for inclusion not only because it fits the organization of the book but also because it represents the best work in this area. Another reason is that Žolkovskij and Mel'čuk publish in esoteric journals and few linguists are familiar with their work, whereas studies in contemporary generative transformational grammar and generative morphonology are published in easily accessible publications widely read by linguists.

The author is fully aware of the fact that this added section does not fill the *lacunae* in the present book, but introducing additional sections on all of the disciplines, trends, and notions mentioned above would require a total reorganization of the book, which the author is not in a position to implement at present.

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PART ONE

FROM THE HISTORY OF STRUCTURAL LINGUISTICS

1

THE EMERGENCE OF STRUCTURAL LINGUISTICS

New scientific disciplines usually emerge and develop under the influence of external as well as internal stimuli.

Among the EXTERNAL stimuli that have encouraged the development of structural linguistics in recent years are some of the technological accomplishments of the last few decades. Just as the invention of the electronic microscope initiated a new, molecular-synthetic phase in the development of biology, so did the construction of speedy electronic computers stimulate the development of linguistics. This technological accomplishment affected linguistics in two ways. First, it gave rise to Information Theory (machine translation, automatic abstracting, information retrieval, etc.), a science which made new demands on linguistics; secondly, the possibility of mechanizing time-consuming linguistic analyses which require little creative effort opened new horizons for linguistics. Computers allow the tackling of large-scale problems involving thorough investigations of long texts, problems which could not be handled with the earlier tools. The preparation of word counts, backwards dictionaries, and concordances of various kinds has in the last decade been almost entirely turned over to computers in a number of countries (in England, the United States, France, West Germany) ⟨192⟩. Computers sometimes also execute simpler linguistic investigations, such as, for instance, isolating the predominant syntactic structures in a language and tallying their frequency of occurrence ⟨114⟩.

In order to take in, store, and give or process information — for the purpose of translating a text, for instance — a computer must know the language in which the information is given. To investigate a text it must also know something about the language. (For

example, in order to determine the syntactic structures of a language a computer must know how to distinguish between word classes, or between syntactic positions.) If the computer does not know the language, it must at least have rules for processing the text, rules by which it would be able, for instance, to extract from the text certain data on the structure of the language in which it is written. Whatever the case, man must communicate with the computer and teach it what it has to know in a language it can understand, namely, in a formal language.

Teaching language to computers turned out to be beyond the reach of conventional descriptive grammar, because its linguistic descriptions were not formal. It thus became necessary to devise more precise descriptions of language, which could be understood not only by man but also by the modern computer.

The significance of these external factors is considerable, but the role of INTERNAL factors in the growth of a new science is much more important. Structural linguistics actually emerged much earlier than the computer technology and the various practical needs which stimulated its growth: it developed from criticisms of conventional descriptive grammar.

The descriptive grammarians gathered large quantities of factual material and excelled in studying the relations between different linguistic categories. However, they did not have any precise concepts for dealing with the linguistic objects, and therefore their assertions cannot be verified. Their concepts evolved haphazardly. For thousands of years every generation contributed its share to the development of linguistic terminology, but the basic terms were never incorporated into a uniform and consistent system. This is why de Saussure asserted that the units linguists worked with were not properly defined, and Meillet, going even further, stated that there were as many variants of linguistics as there were linguists. In these circumstances, leading linguists at the end of the nineteenth century began to scrutinize the foundations of descriptive grammar, and this is how structural linguistics came into being.

To begin with, they were concerned with the vagueness of the

basic concepts used by traditional descriptive grammarians.[1] We shall consider the concept of 'word' as an illustration.

The most widespread, though not universally accepted definition of 'word' is the one proposed by Meillet and cited in Marouzeau's dictionary of linguistic terminology ⟨107⟩. According to this definition, a word is any "combination of a specific meaning and an aggregate of specific sounds, having a specific grammatical usage". Let us suppose for the moment that we already know what 'meaning', 'sound aggregate', and 'grammatical usage' are. We then find out that Meillet's definition applies not only to many words but also, at the least, to many phrases and many morphemes (including grammatical morphemes). In fact, any phrase, root, or affix has 'a specific meaning', is manifested by 'specific sounds', and can be said to have 'a specific grammatical usage'. If we assume, furthermore, that sentences can also have 'a specific grammatical usage' (it will be shown later that this is not an unreasonable assumption), then sentences too must be regarded as words; otherwise we would be inconsistent.

Another drawback of Meillet's definition is that it does not take into account the fact that phonetic manifestations do not always coincide with grammatical and semantic manifestations, and grammatical manifestations do not always coincide with semantic manifestations. Thus in French, due to its rhythmic stress, words have no phonetic boundaries and, consequently, the phonetic segmentation of utterances does not coincide with their grammatical and semantic segmentation; cf. *Pierre / a / besoin / de / ce / livre* 'Pierre needs this book' (showing grammatical word boundaries), and ['pjɛ:r / a-bə-'zwɛ̃ / də-sə-'li:vr] (showing phonetic boundaries between rhythmic groups). Common cases where the semantic and grammatical manifestations do not coincide are analytic forms such as *will work*, *wird arbeiten*, *budet rabotat'*, and phrasal units such as *dat' nagonjaj* 'to reprimand' (literally 'to give a reprimand'). Analytic forms and phrasal units are sometimes referred

[1] For details see, e.g., Vinogradov ⟨30, 33, 35⟩, P. S. Kuznecov ⟨86⟩, Panov ⟨135⟩, Smirnickij ⟨166⟩, and Ščerba ⟨224, 226⟩. Students will benefit particularly from Kuznecov's succinct but highly informative brochure ⟨86⟩.

to as 'formations' consisting of one word semantically and two or more grammatically. The single concept of 'word' thus breaks into concepts such as 'phonetic word', 'lexical word', and 'grammatical word', concepts which can by no means take its place ⟨30⟩.

Now let us examine the terms 'sound aggregate', 'grammatical usage', and 'meaning'. In Meillet's definition they appear to be independent of each other: the form of the definition implies that none of the terms can be derived from the other two. Let us see whether the term 'sound aggregate' can really be used without knowing at least the grammatical forms of the word in question. The term 'sound aggregate' as used in the definition can only mean that every word has a more or less constant phonological composition and that all the possible variants of a word are motivated by special phonetic conditions (as in Russian, for example, the devoicing of voiced consonants before a pause, the voicing of voiceless consonants before voiced ones, etc.). However, suffice it to recall any grammatical paradigm, and in particular paradigms with morphological alternations (alternations that are not phonetically motivated) such as *drug* 'friend': *druz'ja* 'friends' or *begu* 'I run': *bežal* 'ran', with suppletive forms such as *idet* 'goes': *šel* 'went', *čelovek* 'person': *ljudi* 'people', or *xorošij* 'good': *lučše* 'better', and with synthetic and analytic forms such as *čitaet* 'reads': *čital* 'read': *budet čitat'* 'will read', in order to realize that the assumption that the concept of 'sound aggregate' is independent of the concept of 'grammatical form' is an erroneous one. We must evidently understand 'sound aggregate' as a concept comprehending all of the phonological manifestations of a word in its various grammatical forms. Consequently, before determining the sounds by which a word is manifested, we must know its grammatical forms. But then if we know the grammatical forms of a word we no longer need the criterion of 'manifestation in sounds', since it is derivative.

The words 'specific grammatical usage' are quite obscure. We will construe them as specifically as possible within the conventional framework and will regard 'grammatical usage', following the interpretation of Meillet's definition in several popular hand-

books, as applying to all the grammatical forms of a word. Unfortunately, we are bound to discover that even the concept of 'grammatical forms of a word' is defined in traditional grammar in a manner that allows great divergence of opinion as to what units constitute forms of the same word. In a language such as Russian, the diminutive and number suffixes of nouns, the verb aspect affixes and the reflexive suffix *-sja*, the adverbial suffixes, and the suffixes of comparative adjectives are regarded by some scholars as inflectional (in which case the following pairs represent a single word each: *dom* 'house': *doma* 'houses'; *dom* 'house': *domik* 'little house'; *zakryt'* 'to close [perf.]': *zakryvat'* 'to close [imp.]'; *delat'* 'to make, do [imp.]': *sdelat'* 'to make, do [perf.]'; *stroit'* 'to build': *stroit'sja* 'to be built'; *'xorošij* 'good': *xorošo* 'well'; *xorošij* 'good': *lučše* 'better'), while other scholars regard them as derivational (in which case each of the above pairs represents two words). The so-called nonfinite verb forms are a perennial source of controversy: some scholars include them in the verb paradigm, whereas others consider them independent words and even (sometimes) an independent part of speech. The concept of grammatical form is thus not simple enough to be adopted as primary.

We now begin to wonder what criterion is used in determining the grammatical forms of a word, and in particular on what basis *xorošij* 'good' and *lučše* 'better' are considered forms of the same word. Apparently, the only basis is the fact that these forms have the same lexical meaning; otherwise we might just as well have had *xorošij* 'good' and *xuže* 'worse' in the same paradigm, or *ploxoj* 'bad' and *lučše* 'better'. Hence, in order to establish the grammatical forms of a word we have to know its meaning. The concept of grammatical form thus derives from the concept of meaning.

Unfortunately, as linguistic studies demonstrate, just the concept of meaning by itself is not a reliable criterion, as it is not sufficiently specific. In the absence of a rigorous description of meanings, we cannot determine conclusively whether any particular semantic difference between forms indicates a new word or not.

Thus a total definition of 'word', taking into account all of its features (phonetic, grammatical, and semantic), seems unsatisfactory from every point of view. For this reason many linguists have tried to define the concept on the basis of just one fundamental feature. The features most frequently considered fundamental for the word are: (1) having a single stress (a phonetic feature),[2] (2) having the potential of becoming a sentence (a syntactic feature), and (3) having an indivisible, inseparable, or integral composition (a morphological feature). Definitions based on one of these features are preferable to Meillet's because they are constructive, but, nevertheless, none corresponds to the objects in reference to which the term 'word' is used.

One cannot consider the single stress a distinctive feature for words, for many languages have single stress phrases with so-called proclitic or enclitic words, cf. *Čtoby étogo ból'še né bylo*! '(I wish) this to happen no more' (literally 'that this no longer be'), *Já bylo dúmal* 'I almost thought', *Čitáem my mnógo* 'we read a lot' (see ⟨2, 230⟩), and, on the other hand, compound and derivative words with two stresses, cf. English *unknown*, Russian *tëmno-koričnevyj* 'dark brown'. Equally inadequate is the attempt to associate words with sentences, regarding words as 'minimal potential sentences', for there is a large number of 'words' which never occur as sentences, cf. *deskat'* 'as said', *mol* 'as said' ⟨30⟩.

This last definition may also turn out to be tautological, for it presupposes the existence of an independent definition for 'sentence', with no reference to words; yet most existing definitions of 'sentence' do depend on the concept of 'word' in one way or another.

Even the most serious of the three criteria – the syntactic and morphological criterion of 'integrality', proposed and most painstakingly elaborated by Smirnickij ⟨167⟩ – constitutes a basis for distinguishing words constructively only in a small group of mostly inflected languages such as Russian or Latin.[3] Materials

[2] P. S. Kuznecov has recently proposed an operational definition of 'word' based on a phonetic criterion ⟨87⟩.

[3] And even in these languages not without some maneuvering; see Panov's perceptive critical analysis of Smirnickij's views ⟨135⟩.

from other languages leave no doubt about the limited applicability of Smirnickij's theory.

His theory is based on the premise that words, unlike phrases, are integral wholes. The compound *ovcebyk* 'musk ox', for instance, is considered a word rather than phrase, because in the genitive case it takes the form *ovcebyka* rather than *ovcybyka*, its plural form is *ovcebyki* rather than *ovcybyki*, and so on. The integrality of words is manifested also by the fact that other words cannot interpose between their parts.

From this point of view the separable verb prefixes in German and Swedish behave as integral parts of words when they are prepositive, since in that case other words cannot intervene between the prefix and the verb, but when they are postpositive these prefixes behave as separate words, since other words and whole phrases can then intervene between the independent verb unit and the prefix, cf. German *aufnehmen* 'to pick up' – *nehmen das auf*; Swedish *omfatta* 'to embrace, envelop' – *fatta det om*. The definition can be made to apply to this material only at the cost of renouncing the established view that *auf-* and *-nehmen*, and *om-* and *-fatta* represent in both cases the same units rather than homonyms (*auf*-^{1}, *om*-^{1} – prefixes; *auf*^{2}, *om*^{2} – adverbs; *-nehmen*^{1}, *-fatta*^{1} – stems; *nehmen*^{2}, *fatta*^{2} – infinitives). The two possible solutions (i.e., regarding *auf*, *om*, etc. as prefixes and regarding them as words) both involve inconsistencies.

In languages in which the definite article cannot be preposed (Armenian, Bulgarian), it behaves — from the integrality standpoint — as an integral part of words; in languages where it cannot be postposed (English, German, French, Italian, and others), it behaves like a separate word; in languages where it can be either preposed or postposed, the situation is analogous to the one just considered in the preceding paragraph: in Swedish and Danish the postpositive article, the so-called suffixal article, is inseparable from the word, i.e., it is an integral part of it (cf. Swedish *skogen* 'the forest'); when the very same article is prepositive (this occurs whenever a noun with the suffixal article is modified by an adjective), it is a separate word (cf. *den stora skogen* 'the large forest').

In this case too, then, if we wish to sustain the criterion of 'integrality' and at the same time not contradict ourselves outright, we have to view the Swedish (and Danish) definite article as two different units.[4]

Analytic forms such as English *has written*, Russian *budet rabotat'* 'will work', French *est venu* 'has come', are also unaccountable from Smirnickij's point of view. They belong to a paradigm which contains synthetic forms such as *writes*, *rabotaet* 'works', and *vient* 'comes', and they are therefore 'word forms'. On the other hand, their components are independently formed and can separate in a sentence, and they are therefore phrases. Smirnickij was aware of this contradiction, but made no attempt to resolve it ⟨169⟩.

Many of the linguists who recognized the inadequacy of all of these definitions for 'word' came to believe that there was simply no way of defining this concept. Nonetheless, for understandable reasons, they tried to retain the term, claiming that every linguist who has to deal with words is able to provide an unambiguous, though intuitive definition for the concept. Unfortunately, this is not the case. Linguists argue interminably over whether particular elements are words, word components (morphemes), or phrases. Some Romanicists consider French forms such as *il* 'he', *je* 'I', or *le* 'him, it' words ⟨72⟩, whereas others consider them adverbial morphemes ⟨17, 29⟩. Some English specialists define formations such as *stone wall* as (fluid) compounds ⟨167⟩, while others view such formations as free collocations ⟨320⟩. Some linguists consider German verbs with separable prefixes e.g., *aufnehmen* 'pick up', *einführen* 'introduce', words (this is the practice of German lexicographers, for example), but others regard the same forms as phrasal units, i.e., word combinations ⟨94⟩. It should be emphasized that in all of these cases we are dealing with very common forms in three well-studied languages.

The foregoing does not mean to say that we question the use-

[4] The so-called 'fused articles' or 'articular prepositions' in Romance languages are also quite problematic, cf. French *au (à+le)*, *des (de+les)*, Italian *al (a+il)*, *del (di+il)*, *sul (su+il)*, etc.

fulness of the concept 'word'. All we are saying is that the definitions of this concept cannot be considered precise because they either (1) do not offer a list of empirically ascertainable properties by which one could determine conclusively whether any random element belongs to the class of words or to the class of nonwords, or (2) they do not apply to the whole array of elements in regard to which this term is in fact used.

In the great majority of cases the vagueness of the basic linguistic concepts is a direct and inevitable consequence of the fact that they are defined, in the final analysis, on SEMANTIC grounds. In fact, since there is no formal and comprehensive description of meanings in traditional linguistics, the so-called 'semantic criterion' is purely intuitive. It is inevitable, of course, that linguists rely on their intuitive knowledge of their objects when they set out to develop a theory. However, intuition cannot be accepted as the major piece of evidence in support of a theory. This would exclude any possibility of detachment and of transmitting knowledge in an unambiguous way: all one can do with a description founded on intuition is appeal to the reader's intuition, giving examples in order to 'arouse' in the reader a notion of the object which does not necessarily coincide with one's own but perhaps resembles it.

The problem of a scholar whose purpose is to develop a theory is indeed how to FORMALIZE his basically intuitive knowledge of the object. Only a formal theory permits empirical verification and the transmission of knowledge to others in an unambiguous way.

The semantic criterion is also hazardous in another respect: the classification of objects on the basis of their semantic features without a formal theory of meaning might turn out to be infinite, for in principle there is no limit to the semantic differences one could take into account. Peškovskij's discussion of the meanings of the cases in his *Russkij sintaksis v naučnom osveščenii* is quite instructive in this respect:

As the meanings of the cases are closely related to the referential meanings of the governors and the subordinate words, the investigator is tempted to set up as many parameters as can be found for the

referential meanings of each of the concatenated elements and to add more parameters for their various combinations. Thus, once an investigator establishes, let us say, the meaning of INSTRUMENTALITY for the instrumental case in phrases such as *rubit' toporom* 'to chop with an axe' and *pilit' piloj* 'to saw with a saw', he may discern a new meaning in the phrases *sxvatyvat' mysl'ju* 'to grasp mentally', *čujat' serdcem* 'to feel in one's heart', or *ponimat' umom* 'to understand in one's mind', for in these cases the 'instrument' as well as what it does are entirely different; and then he may discern still another meaning in the phrases *dejstvovat' podkupom* 'to act by bribery', *dobivat'sja čego siloj, terpeniem* 'to try to achieve something by force, patience', or *očarovyvat' kogo ostroumiem* 'to charm someone by one's wit'. In the first instance one could refer to a case of 'mental instrument', in the second — to a case of 'means'... When one adopts this course *there is no limit* to the fragmentation of meanings (for example, one could distinguish between 'mental' and 'emotional' instruments, between physical, economic, and social means, and so on)... ⟨144, *261*⟩.

F. F. Fortunatov, the founder and most brilliant representative of the Moscow linguistic school, was one of the linguists who recognized these hazards at an early date and who sought ways of avoiding them. The essence of Fortunatov's views in this regard can be learned from his theory of 'grammatical word classes', which was his answer to the traditional part of speech doctrine.

The traditional principle of classifying words by their semantic, syntactic, and morphological features ⟨45⟩ is followed fairly consistently only so long as these features are more or less in agreement with each other and mutually predictable (as is the case, for instance, with nouns, adjectives, and verbs). When these features do not concur and are not mutually predictable, words are in fact classified not by their entire complex of features but by their semantic features alone. It is only on semantic grounds that pronouns and numerals are distinguished as separate classes, for neither class is syntactically or morphologically homogeneous. In fact, words like *on* 'he', *ona* 'she', or *nikto* 'nobody' behave essentially like nouns, while words like *vsjakij* 'any', *každyj* 'every', or *nikakoj* 'not any', which are relegated to the same class, follow the adjectival paradigm and behave essentially like adjectives. The so-called quantitative numerals, with the exception

of *odin* 'one', have in Russian the features of nouns under certain conditions (cf. *pjat' devušek* 'five girls', *vižu pjat' devušek* 'I see five girls', where the numeral governs the genitive case of the noun), and the syntactic features of adjectives under other conditions (cf. *pjati devuškam* 'to five girls', *pjat'ju devuškami* 'by five girls', where the numeral agrees in number and case with the noun). On the other hand, the ordinal numerals and the word *odin* 'one', which are also relegated to the same class, have the paradigm and syntactic functions of adjectives.

Instead of the traditional comprehensive classification, which was in fact no more than an inconsistent semantic classification, Fortunatov proposed a strictly morphological classification. His principal criterion was the presence or absence of form (divisibility into stem and affix) ⟨191, *68*⟩. He thus had two groups of classes: classes of inflected words and classes of uninflected words. He proposed three classes of inflected words, distinguished according to the type of form: (1) conjugated words (verbs), (2) declined words (nouns), and (3) declined adjectival words. He used semantic criteria only on the third level of classification, where the second class was divided into three subtypes, and the third class into four (name words, pronominal words, participles, and ordinal numerals). The uninflected words, i.e., the words in the second group of classes, were classified according to whether they were derivative (derivative adverbs) or nonderivative (including also nonderivative adverbs).

The general principles of this classification, which was quite remarkable for its time, turned out to be so viable that some fifty years later they were used with only minor modifications in many studies made by structural linguists ⟨44, 251⟩.

Traditional descriptive grammar was also criticized on other accounts. It is primarily an ANALYTIC discipline. Though it does not differentiate clearly and consistently between the speaker's point of view and the hearer's, the predominant method of description corresponds to the latter point of view: the source material consists of linguistic forms, and the linguist's analysis yields enumerations of the possible meanings (or functions) of each form.

This is the method used in the *Grammatika russkogo jazyka* of the U.S.S.R. Academy of Sciences ⟨45⟩, which is a model illustration of traditional grammar. A typical description in the Academy grammar opens with the introduction of some form (a case, number, tense, or mood morpheme, for instance, or a type of phrase or sentence), and concludes with a listing of the meanings it expresses (for case morphemes, for example, these would be object, instrument, cause, quantity, a stretch of time or space, etc.). Only rarely and unsystematically, primarily in descriptions of derivational suffixes signifying agent, action, quality, etc., is the description given in the reverse order, i.e., from some given meaning to the various ways in which it can be expressed.

The preference given to classificatory, analytic grammar seemed unwarranted to many leading linguists, e.g., Paul ⟨346⟩, Brunot ⟨257, 258⟩, Sapir ⟨175⟩, Jespersen ⟨55, 319, 320⟩, and Ščerba ⟨229, 149⟩, and they spoke, in one way or another, of constructing grammars of two types: hearers' grammars and speakers' ⟨55⟩, analytic grammars and synthetic ones ⟨175⟩, or passive and active grammars ⟨229⟩. Sapir, for instance, wrote that the question of form in language could be approached from two points of view: "What are the formal patterns of the language? And what types of concepts make up the content of these formal patterns? The two points of view are quite distinct ⟨175, *45*⟩".

Later on we shall have an opportunity to consider the analytic and synthetic approaches to the description of language at length. Here, in accordance with our general plan, we shall give a brief account of the two most serious attempts to construct grammars on new conceptual grounds: Brunot's and Jespersen's.[5]

Brunot defined his objective as follows: "My wish was to present a methodical account of the facts of thought, examined and classified in relation to language, and of the means of expression which correspond to these facts ⟨257, *VII*⟩". This statement explains why Brunot questioned the value of the analytic grammars

[5] For a more detailed account of Brunot's and Jespersen's theories see Sergievskij's substantial essay ⟨160⟩, where their views are compared with those of Brøndal, Bally, Ščerba, Kuryłowicz, and Vinogradov.

that predominated in his day. Their approach was historical and they blindly followed the part of speech classification developed by the grammarians of antiquity on the basis of Greek and Latin materials. Brunot's grammar, which went from concepts to their means of expression, excluded by its very nature both the historical approach to current linguistic facts and the whole notion of parts of speech, for historical changes occur not so much in concepts as in the means of their expression, and a concept can be expressed by various means, including different parts of speech. Brunot's innovations were not properly understood and appreciated by his contemporaries ⟨268, *12-15*⟩, not even by the eminent Bally ⟨241⟩, who believed his colleague to be destructive for grammar, while in fact Brunot was most constructive.

Following his general scheme, Brunot classed together in his grammar, for example, "all the *means of interrogation* and all the *means of negation*, whether adjectives, pronouns, or adverbs" ⟨258, *252*⟩, and also all the means of expressing cause, goal, result, hypothesis, etc. He treated the articles together with other means of expressing definiteness and indefiniteness, e.g., pronouns like *quelconque* 'whatever', *un certain* 'a certain', *quelque* 'some', *quelqu'un* 'someone', *quelque chose* 'something', *plusieurs* 'several', *qui que ce soit qui* 'whoever', etc. ⟨258, *335*⟩. Numerals were discussed together with other words expressing the category of number: ordinal adjectives (traditionally referred to as ordinal numerals), names of fractions and 'products' (cf. *double*), collective nouns, and distributive words like *chacun* 'each', *chaque* 'every', *par* 'per', etc. ⟨258, *401-419*⟩.

Following this course, Brunot went considerably farther than his contemporaries and was the first to present all the facts of a language (French) from a consistently synthetic point of view.

Jespersen's work is interesting not so much for its concrete results, i.e., an exposition of English grammar from a new, synthetic point of view, as for some general notions which together constitute a more methodical and coherent system than Brunot's. Unlike Brunot, Jespersen insisted on the theoretical imperativeness of considering linguistic facts from two points of view: from a

particular form via its function to the extralinguistic meaning it expresses, and from a particular extralinguistic meaning via a function to the form that expresses it. The terms 'form', 'function', and 'meaning' are not defined by Jespersen in a rigorous fashion, but we can get an idea of what they refer to by examining the diagram he gives (Diagram 1).

A. FORM	B. FUNCTION	C. CONCEPT
[-Id] *(handed)* [-t] *(fixed)* [-d] *(showed)* [-t] *(left)* ∅ *(put)* internal inflection *(drank)* suppletion *(was)*	preterite	1. Past 2. Irreality in the present *(I wish I knew)* 3. Future *(It's time you went to bed)* 4. Shifted present 5. Universal time and so on.

DIAGRAM 1

Jespersen called the first approach, the one corresponding to the hearer's point of view (from form to meaning) – MORPHOLOGY. He called the second approach, the one corresponding to the speaker's point of view (from meaning to form) – SYNTAX.[6] The chapters of a grammar written from the first point of view contain homonyms, whereas the chapters of a grammar written from the second point of view contain synonyms.

The functions, i.e., the syntactic categories, vary from one language to the next; every language has its own unique set of functions. But the concepts, i.e., the extralinguistic, conceptual, or logical categories, are universal and independent of the more or less accidental facts of existing languages. Since the conceptual categories are universal, every language must possess the means to express all of them, but the means by which any given category is expressed in different languages should not necessarily coincide. Moreover, since the conceptual categories are independent of the syntactic categories of particular languages, it is possible for a

[6] "Syntax...views grammatical facts from within...from their meaning" ⟨319, *1*⟩.

conceptual category to be expressed by different means in one and the same language. Thus, the logical differentiation between active and passive is expressed by verbs through voice (cf. *to eat*: *to be eaten*), and by adjectives and nouns through suffixes (cf. English *decisive*, *talkative* vs. *eatable*, *visible*; *employer* vs. *employee*; *arrival* vs. *defeat*; cf. Russian *ljubitel'* 'lover': *ljubimec* 'beloved'; *učitel'* 'teacher': *učenik* 'pupil'; and so on ⟨320⟩).

Since the conceptual categories are universal, grammars of different languages can be written on the basis of the same material. The grammatical structure of any language can be described as a system of means for expressing a set of conceptual categories that is invariable for all of the analyzed languages. This form of exposition has at least one advantage in that it gives us a natural basis for comparing grammatical structures of different languages and for developing a systematic linguistic typology in which the conceptual categories serve as common denominators.

This notion of conceptual categories, which is reminiscent of the 'general', or 'universal' grammars of the classical era ⟨268, *12-15*⟩, did not have much effect on the linguistic thought of Jespersen's contemporaries.[7] Only now, with the actual development of synthetic and generative grammars, can we really appreciate the significance of these profound observations.

Quite significant for the history of linguistic thought were the attempts made by some linguists to go beyond the EMPIRICISM of traditional descriptive grammar, which, as observed by the distinguished Danish linguist Vigo Brøndal, was concerned almost exclusively with directly observable phenomena ⟨27, *40*⟩. These linguists tried to work out a system of general concepts independent of the structure of any particular language. These could be concepts of universal linguistic objects (observed in the structure of every language), or of objects inferred from the logical nature of thought.

One example of the quest for a general system of linguistic concepts is the classification of content words into no more than

[7] Meščaninov ⟨119⟩ apparently arrived at the same position independently.

two classes, nouns and verbs, a classification known since the days of antiquity. It is supported by logical considerations as well as by data from various languages. Sapir considered it universal: "No language wholly fails to distinguish noun and verb", he wrote, "though in particular cases the nature of the distinction may be an elusive one. It is different with the other parts of speech. Not one of them is imperatively required for the life of language ⟨175, *95*⟩".

The empiricism of traditional grammar also shows in its concentration on the study of PARTICULAR rather than general properties. The general properties of entities such as, say, words, phrases, or sentences are usually not considered by traditional grammarians. From this point of view, some of Jespersen's notions are quite significant, and especially his theory of syntactic ranks and types of syntactic combination, which he used as the basis for a uniform account of words, phrases, and sentences.

Units in sentences were classified by Jespersen as belonging to one of three ranks, distinguished on a functional (syntactic) basis. In conventional terms, his primary units were subjects and objects, his secondary units were predicates and attributive modifiers, and his tertiary units were adverbials of various kinds;[8] cf.:

We leave here tomorrow;
I II I III

a not very cleverly worded remark.
III III III II I

This system was also applied by Jespersen to complex sentences. He regarded main and subordinate clauses as primary, secondary, or tertiary ⟨320, *78-90*⟩.

The same concern for generality and simplicity also characterizes Jespersen's theory of the two kinds of syntactic combination: JUNCTION — a close attributive link (cf. *krasnyj cvetok* 'red flower'), and NEXUS — a free predicative or semipredicative link (cf. *Ja*

[8] Note the correspondence between these three grammatical ranks and the logical concepts of argument (the variable subject), first order predicate, and second order predicate.

zastavil ego ujti 'I made him leave'). We shall not go into the details of this theory here; for our purposes it will be enough to stress the following points:

(1) Language possesses means to convert a nexus combination into a junction with no change in the rank structure of the sentence, cf. :

The dog barks furiously;			*a furiously barking dog.*		
I	II	III	III	II	I

Phrases and sentences are thus viewed as equivalent (in a certain sense).

(2) The two kinds of combination occur not only between the elements of phrases or sentences but also between the elements of compound words. The morphemes of the words *cleverness* and *arrival,* for instance, are combined by nexus, and these nouns therefore function as substitutes for whole sentences.[9]

Thus, on the basis of his theory of syntactic ranks and kinds of syntactic combination (nexus and junction), Jespersen tried to capture the fundamental similarity in the structure of words, phrases, and sentences which was later to become one of the cornerstones of the transformational theory of language.

The material considered in this chapter shows that the awareness of the need to scrutinize the linguistic concepts and the methods of language study arose from WITHIN classical linguistics, and that it was this scrutiny which produced the elements of the structural approach to language.

[9] Similar views were expressed by Tesnière ⟨365⟩, Kuryłowicz ⟨89⟩, and several others.

2

IMMEDIATE FORERUNNERS OF STRUCTURAL LINGUISTICS

Some of the forerunners of structural linguistics have already been mentioned in Chapter 1. One of them is the noted Fortunatov, whose approach to grammar and linguistics in general was remarkably perceptive for his time. However, for a number of reasons he was not destined to exert the kind of influence on the development of linguistics which a scholar of his stature could expect ⟨228⟩. When members of the three principal schools of structural linguistics name their mentors and immediate forerunners, they refer to Baudouin de Courtenay and Ferdinand de Saussure, not to Fortunatov ⟨27, 51, 110, 179, 256, 259, 376⟩.

Baudouin de Courtenay,[1] who was, in Ščerba's words, a Russian linguist as much as a Polish linguist, anticipated de Saussure's discoveries in many respects, though his theory was not as refined, as consistent, or as lucid as de Saussure's. His basic ideas can be summarized as follows:

1. He noted the difference between "language as a certain complex of certain components and categories... and language as a continually repeated process ⟨96, *116*⟩". This notion was later formulated explicitly by de Saussure in his theory of *langue* and *parole*. Following this line of thought, Baudouin was the first to distinguish between sounds and phonemes, which were regarded by his contemporaries as one and the same thing. Baudouin maintained that there were no sounds in language, only phonemes, or "sound images", i.e., psychological rather than physical entities ⟨23, *14-15*⟩.

The most significant aspects of Baudouin's conception of the phoneme are the following:

[1] On Baudouin de Courtenay see, e.g., ⟨23, 24, 25, 22, 96, 223, 129⟩.

(1) He conceived of the phoneme, especially in his later period, as "the image of a simultaneous and intricate complex of articulatory movements ⟨23, *14*⟩", as the SUM of articulatory and acoustic images.

(2) He realized that phonemes had a distinctive role. He maintained that although they had no meanings in themselves, they were "semasiologized" and "morphologized" like the "more specific articulatory-auditory elements" ⟨23, *164*⟩; cf. the examples given by Baudouin: *sad* 'garden': *zad* 'back' (the image of the operation of the vocal chords is semasiologized); *mat'* 'mother': *dat'* 'to give' (among other things, the operation of the soft palate is semasiologized).

(3) Baudouin considered it important to devise a designation for each image of articulatory movement in the phoneme, so that each image would have its own special symbol.

(4) In studying sounds,

> Baudouin searched for methods as objective and exact as possible, and in his explorations expressed some strikingly perceptive hypotheses (in particular the notion of studying the properties of sounds so as to represent them graphically) ⟨70, *142-143*⟩.

These views of Baudouin indeed underlie the contemporary structural conception of the phoneme as a bundle of distinctive phonological features, the method of describing phonemes by means of 'identity matrices', and the spectrographic devices for studying phonemes and representing them graphically ⟨235⟩. Unfortunately, Baudouin's phonetic and phonological insights were more advanced than the state of science in his day and could therefore not assume a more concrete form, as there were no experimental methods and mechanical devices to determine the distinctive features of the phonemes ⟨235⟩.

2. At a time when linguistics meant comparative historical linguistics, and when historical processes were the only linguistic phenomena considered worthy of scientific study, Baudouin made a distinction between the dynamic (the process) and the static (the state) in language and was the first to propose that linguistics

be equally concerned with both. "Outside of Baudouin's school", wrote Ščerba, "everyone believed that grammar was scientific only insofar as it was historical...now, primarily thanks to Baudouin, no one questions the scientific import of descriptive grammar... ⟨223, *86-87*⟩".

Related to this point of view is

> Baudouin's consistent preference...for living languages over dead ones; he considered living languages more instructive about relations between phenomena, about what brings about change, about all of the factors which affect the life of a language ⟨223, *89*⟩.

Moreover, what interested Baudouin in living languages was their current system rather than vestiges of forms and categories of the distant past, which were the chief preoccupation of the neogrammarians, for he realized that the system of a language at a particular point in time could differ from the system that characterized it at some earlier stage.[2]

3. Baudouin was among the first to note that written language had a structure different from that of oral language. He realized that grammatical paradigms were a function of the mode of language used. In line with this observation, Baudouin made a distinction between letters and sounds,

> thanks to which many chapters on morphology are now different from what they used to be in the older grammars: *j* in the words *kraj* 'edge' or *maj* 'May' is no longer presented as a singular nominative case ending but rather as an integral part of the stem; this applies also to the personal possessive adjectives *moj* 'my' and *tvoj* 'your', whose nominative case forms are now identified with those of the nominal declension ⟨223, *87*⟩.

Cf. ⟨125⟩.

4. Baudouin also had some prophetic thoughts on the future of linguistics and the place of mathematics in its subsequent

[2] Fortunatov arrived at similar conclusions independently and approximately at the same time, when he noted that derivative stems could become nonderivative (cf. *de-lo* → *del-o* 'matter') and made a distinction between the concept of root "for the contemporary language" *(del-)* and "in historical perspective" *(de-)* ⟨191⟩.