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valo. Svým vyhraněnějším lingvistickým pohledem uvedl na vyšší úroveň také řešení problémů historického hláskosloví. Potom se Malmberg znovu vrací k Martinetově *Économie* a říká, že ačkoliv jde o dílo diskusní v mnoha teoretických i praktických otázkách, je významným přínosem k metodologickým problémům evoluční fonetiky a kromě toho jedním z nejzávažnějších příspěvků do debaty o lingvistické metodologii. Kapitola o moderní (experimentální) fonetice zachycuje dějiny a stav fonetického bádání se zvláštním zřetelem k té jeho části, kterou lze využít pro technické účely, např. při konstrukci přístrojů pro mechanické zapisování mluveného slova a převádění psaného textu do mluvené řeči apod. Přitom do fonetických výzkumů nejednou pronikají prvky a kritéria teorie informace (zjišťování redundance hláskových formantů atd.) Sémantice věnovaná kapitola podává – kromě historického přehledu sémantického bádání – charakteristiku sémantické teorie Ogenovy, Richardsovy, Morrisovy, Hjelmselevy, Cassierovy, Ullmanovy, jakož i Chaseovy, Hayakawovy, Greenbergovy, Wartburgovy a dalších. Důkladnější se zabývá Ullmanovým pokusem o vytvoření tzv. strukturální historické sémantiky. Moderní sémantiku pak hodnotí takto: „Příspěvek moderní sémantiky k popisu jazyka záleží tedy v uvedení... té metody strukturální analýzy do lexikálně sémantického plánu, již tradiční popis jazyka přiřkl místo... v plánu gramatickém. V lexikálním plánu je tedy moderní sémantická analýza totéž co fonologie... v plánu fonologickém.“ Kapitola o glossematice, Hjelmselevy jazykové teorii a moderní dánské jazykovědě nejdříve podrobně rozebírá Hjelmselevův spis *Omkring sprogteoriens grundlæggelse* z roku 1943, v němž se autor pokouší o vytvoření immanentní teorie jazyka, a charakterizuje práci Kodaňského lingvistického kroužku (Uldall, Bjerrum, Hansen, Ege, Togeby aj.). Pokud se týká moderního jazykozpytu ve Spojených státech, jemuž je věnována zvláštní kapitola, poznamenává Malmberg, že bohatství pojmů, s nimiž pracuje americká lingvistika, neznamená vždy, že jde o nové skutečnosti. Nezdídka se totiž jedná jen o nové pojmenování známých fakt. Politováníhodným důsledkem této terminologické roztříštěnosti pak je, že americký a evropský strukturální jazykozpyt není s to nalézt společnou řeč, což způsobilo přerušení styků mezi oběma školami. Kapitola o použití statistických a matematických metod a teorie informace v jazykozpytu se zabývá zjišťováním frekvence slov a tím, co se v tomto ohledu v jednotlivých jazycích vykonalo, významem teorie informace pro jazykozpyt, překládacími stroji a příslušnou literaturou k tomuto předmětu (Whatmough, Wiener, Shannon aj.) Knihu uzavírá kapitola nazvaná Příspěvek psychologie a filosofie ke studiu jazyka, v níž je rozebírána především Bühlerova *Sprachtheorie* a Kainzova *Psychologie der Sprache*. V rámci téže kapitoly se autor zmiňuje také o výzkumu dětské řeči a o problému dvojazyčnosti.

Je přirozené, že Malmbergův pohled na současnou lingvistiku se od světové jazykovědné literatury zhusta obrací k pramenům skandinávským, takže se v jeho knize setkáváme i s pracemi Collinderovými, Brendalovými, Sommerfeltovými, Holmerovými atd. Toto uznání do skandinávského prostředí je však rozhodně ku prospěchu celkové koncepci Malmbergovy knihy, uvážíme-li, jak významnou roli severská lingvistika hraje ve světovém měřítku. Malmbergův úvod do moderní lingvistiky je tedy třeba přijmout nejen jako dokonalého bibliografického průvodce po aktuální lingvistické literatuře, nýbrž i jako ucelený obraz vývojových tendencí, které tomuto vědnímu oboru vládnou.

Libor Štukavec

Emmon Bach: An Introduction to Transformational Grammars, Holt, Rinehart and Winston, Inc., New York, Chicago, San Francisco 1964, pp. 205.

1. The book by E. Bach is, as far as we know, the first thorough and systematic introduction into the problem of transformational grammar (TG) and theory of grammar.¹ It contains a revised and completed version of the author's course in TG at the Texas University. The ideas of the book are in agreement with those of a number of representatives of TG, namely of N. Chomsky.

The subject matter is exposed in 8 chapters progressing from the most simple to more complicated concepts. The introductory Chapter I deals with the aims of linguistics and with linguistic data. The aims of linguistics are a theoretical research in language, explanation and prediction of linguistic facts (e.g. in describing a language it is necessary to state clearly which sentences of the given language are and what their structure is), as well as to devise theories of concrete languages (their grammars) and theories of language in general. Linguistic theory is concerned with empirical linguistic facts whose nature is such that we cannot deal with them directly, but only if they are recorded in any form (e.g. in the form of symbolic representation). Linguistic facts are also of a social character, since language is, beside other things, a social institution and it is necessary to account also for the „intuition of the native speaker“, i.e. for his ability to understand an infinite number of sentences of a given language, (even those which are quite novel for him since he has never heard them before), as well as his ability to create an infinite number of sentences of the given language.

In Chapter II, some basic concepts of transformational grammar (TG) are explained. In

fundamental questions, Bach closely adheres to N. Chomsky,² but differs from him by greater clarity of exposition and a number of telling examples. To facilitate the understanding of the problems under discussion, Bach constructs a hypothetical language X, compares both its descriptive and generative descriptions, and shows that the generative description is markedly simpler.

Chapter III deals with the phrase-structure component of TG, especially with the restrictions of phrase-structure (PS) rules. A detailed explanation is given of the terms phrase marker, derivation, constructional homonymity and so on. Sufficient space is devoted to the questions of simplicity of PS grammars, readability of PS rules, i.e. to the demand for the set of rules to be as simple as possible, e.g. to contain as few different symbols as possible, and to contain lucid and easily understandable designations for non-terminal symbols, which otherwise can be chosen arbitrarily. Also some inadequacies in PS rules are considered.

Chapter IV contains an explanation of transformational rules (T rules), of the differences between them and PS rules; the relative merits of T rules are demonstrated and different types of T rules displayed (e.g. generalized — two string — transformations), and their characteristic features analysed (replacement, expansion, reduction, addition, permutations). Practical application of T rules is again demonstrated on language X.

Chapter V, a one of very inspiring sections, is devoted to some syntactical problems of Japanese, solved by means of T and PS rules; it is of special interest in its second part where the grammatical relations of order, contiguity, co-occurrence are examined by means of PS and T rules (for further detail see Sect. 2.2 of the present review). These relations make possible to divide languages into different types, according to places these relations place within them. At the same time, this is an interesting and in our view successful, attempt to master traditional terms, such as concord and government (i.e. dependence) by means of PS and especially of T rules.

Chapter VI is devoted to the phonological component of TG, which transforms strings of formatives into strings of phonetic symbols defined in some general phonetic theory. This part, more or less, sums up the ideas contained in the works by Chomsky and by Halle.³

Chapter VII contains a concise and very instructive introduction into the theory of grammar and a discussion of the relations between linguistics and mathematics. Among others, the basic concepts of the set theory and theory of relations are explained; it is especially designated for linguists who have no experience in mathematics or symbolic logic. Besides, one part of Chomsky's paper *On Certain Formal Properties of Grammars* (*Information and Control* 2, 1959, 137—167) is analysed and commented upon.

Chapter VIII is devoted to the branches of linguistic research in general: 1. the formal theory of language, i.e. the construction of particular TG for natural languages; 2. the general theory of language, i.e. the difficult problem of validating grammars and the description of the types of devices from which the grammars of particular languages will be chosen, as well as the solution of problems resulting from the fact that general theory must provide eventually a set of terms for filling in the substance of the sets of rules; 3. the use and testing of this general theory in constructing theories about particular languages, i.e. evaluating of specific grammars; 4. a study of language use, e.g. theories about speaker and hearer; 5. various other studies relating linguistics to other disciplines, as for example psychology, sociology, literary theory and so on (p. 171). In this chapter, Bach also mentions the testing of grammars of a language (that is to say TG), e.g. ascertaining that the given grammar provides adequate structural descriptions (SD) of all generated sentences. This can be easily done by including in the programme of the computer both vocabulary and grammar (as demonstrated by Čulík⁴, the latter can be considered a semi-algorithm). The computer generates sentences of the language together with their SD.⁵ If the grammar is correct, the computer will generate well formed sentences only (regardless of their semantic contents). By this procedure, the grammaticality of sentences is tested as well.

Certain ambiguities occur when determining which are the sentences of a given language. Procedures using informants are, according to Bach, not fully reliable (in some cases informants do not reply, or change their views). It is further necessary to test the correctness of the given TG, i.e. to find out whether it does not lead to SD with constructional homonymities and ambiguities. The testing of the completeness of TG consists in finding out whether the given TG covers all the facts of a language.

2. Conclusions. The present volume by F. Bach will undoubtedly be welcomed by linguists and students interested in an initiation to algebraic linguistics. It has all the prerequisites necessary to help the overcome the unwarranted and yet so frequent fear of things somehow connected with mathematics and with symbolic logic. It is concerned rather with practical than theoretical aspects of problems and it is illustrated with a number of examples leading the reader to new

applications of TG. At the end of each chapter there are exercises giving the reader opportunity of a thorough and practical mastering of the problems under discussion.

The present book is built on the assumption that all the grammars in question, describing individual language, are generative. It might be suitable to mention in this connection some of the other procedures and methods as well, e.g. recognoscative grammars, whether they be dependential or categorial ones — and to make comparisons.

It is necessary to realize that the conception of TG, as expounded by Bach, underwent substantial developments recently. The early TG, as generally, contained two components: the phonological and syntactic ones, the latter consisting of the phrase-structure subcomponent generating the so-called kernel sentences, and the transformational subcomponent, all other sentences being derived from kernel sentences by means of generalized transformations. The phonological component gives the transformed terminal strings their final phonetic shapes. The present TG comprises three components: the syntactic, semantic and phonological ones. As a result of including the semantic component, the role played by the transformational subcomponent has undergone substantial changes, the latter containing only so-called singular transformations,⁶ and serving to filter out the subsets of incorrectly formed deep structures generated by the base; it serves as subpart of the syntactic component. One reason which led to considerable developments in TG were the inconveniences caused by formalization and the complicated formal character of generalized transformations and transformation markers. As E. Bach's book was published sooner than the new developments in TG took place, it could not take account of them.

2.2. Also Bach's ideas on grammatical relations (p. 103 ff.) are original and inspiring. Relations of order will be mentioned here. There are several possibilities of describing the order of linguistic elements: 1. A language is considered as fixed-order if it has the following property: for every pair of terminal elements x and y in the language, if x precedes y in a sentence, then y precedes x in no sentence; 2. Let us call such a language a fixed-phrase language. It would have the following property: if there is in the grammar a string containing the substring (terminal or non-terminal) XY such that XY is dominated by Z , then there is no string in the grammar containing the substring YX such that YX is dominated by Z ; 3. Another variation might be called semi-fixed language. In such language if there is a sentence $\# a + b + c + d \#$, then there are no sentences $\# a + c + b + d \#$, $\# a + d + b + c \#$ and so forth; 4. Free-order languages, in which the items in any terminal string could be rearranged in any way, the result still being a sentence of the language; 5. Partially free languages. In such systems which are little easier to imagine that a completely free system, at least one level of elements would be internally fixed in order but could be freely ordered in respect to each other. To the last type English or German evidently belong according to Bach. Bach shows in his examples that PS rules are inherently incapable of generating freely ordered combinations of items in a neat way (p. 109), and that alternative description using T rules is intricate as well. According to Bach, there are two ways to avoid this difficulty. One is to make several special transformations in which the actual word types are specified: one for nouns, one for verbs, and so on. The second approach takes advantage of the possibility to set up various boundary symbols (p. 111—112). It seems, however, that there is a more serious problem, namely that of the methodology. Let us quote the author (p. 120): "It should be apparent from the discussion of the last few sections that the general principle of analysis is to set up a regularized system which can be easily described and which can be transformed into the shape of terminal strings. We describe a free-order language as if it were fixed and then rearrange items". It is evident that for some languages, e.g. Czech, Russian and the like, this method is hardly acceptable. It is symptomatic e.g. that none of the investigations concerned with Czech, Slovak or Russian word order⁷ uses the above-mentioned "permutation" method, but tries to introduce the variations of word order directly into the system, in the same way in which dependency grammar introduces the notion of dependency (of course, we are aware of the fact that literature quoted in Note 6 does not use formalized procedures). As can be seen, the assertion that language can be described only by generative procedures of the TG type is restrictive and inspired by languages of a certain type only, especially by English. It is true that the method of TG has not been applied to Czech⁸ as yet, but it is evident that a description of word order would be rather complicated; in Czech, there exist, e.g. well formed sentences of 5 units (phrases) of which one can make the $5!$ permutations, e.g. the sentence „Otec zemřel včera v nemocnici za velkých bolestí". It would be interesting to know in this connection what will be the solution of these problems in the new conception of TG, and it would be rash therefore to attempt at a definitive evaluation.

To conclude, it is necessary to say that E. Bach's book has lost nothing of its value by developments of the conception of TG, since if anybody wants to understand the new conception of TG,

at first he must yet well acquainted with the former one. The book serves this purpose very well and we have been waiting for it long enough. We wish it were more easily accesible in this coutry.

Notes

1. Cf. also the review by B. Palek in The Prague Bulletin of Mathematical Linguistics 1, 1964, 55—74.
2. N. Chomsky, *Syntactic Structures*, The Hague 1964, 4th ed.
3. M. Halle, *Sound Pattern of Russian*, The Hague 1959, N. Chomsky, G. A. Miller, *Introduction to the Formal Analysis of Natural Languages*, Hanbook of Mathematical Psychology II, chapt. 11, New York—London 1963.
4. K. Čulík, *Formal Structure of ALGOL and Simplification of its Description*, Proc. of Symposium on "Symbolic Languages in Data Processing", 1962.
5. V. H. Yngve, *Random Generation of English Sentences*, First International Conference on MT and Applied Language Analysis, Teddington, Middlesex England 1961.
6. Cf. especially N. Chomsky, *Categories and Relations in Syntactic Theory*, M. I. T. 1964 (mimeographed), P. Postal, *Nový vývoj teorie TG*, SaS 26, 1965, 1—13 (translated from English).
7. Cf. e. g. F. Daneš, *K otázce pořádku slov ve slovanských jazycích*, SaS 20, 1959, 1—10; *Věta a intonace ve spisovné češtině*, Praha 1957; J. Firbas, *Ze srovnávacích studií slovosledných*, SaS 23, 1962, 161—174; *Some Thoughts on the Function of Word-Order in Old English and Modern English*, SPFFBU, 1957, A 5, 72—100; V. Mathesius, *Základní funkce českého pořádku slov*, Čeština a obecný jazykozpyt, Praha 1947, 327—352; P. Adamec, *Slovosled v ruštině*, unpublished dissertation, Praha 1963; V. Mistrík: *Slovosled a vetosled v slovenčine*, unpublished dissertation, Bratislava 1964.
8. Examples of the application of TG procedures to Czech are contained in B. Palek, *Informace o transformační gramatice*, SaS 24, 1963, 140—151. Karel Pala

Maurice Leroy: Les grands courants de la linguistique moderne. Paris, Presses universitaires de France — Bruxelles, Presses universitaires de Bruxelles, 1963, 198 pages.

Cet excellent manuel — destiné surtout à l'usage des jeunes linguistes, mais qui sera apprécié même par les linguistes expérimentés — commence par un bref aperçu de l'évolution des études linguistiques de l'Antiquité au dix-neuvième siècle. L'auteur nous donne les informations sommaires sur les travaux des Indiens, des Grecs et des Latins sans cependant mentionner ceux des Arabes (les écoles de Basra, de Koufa et de Bagdad, les linguistes Sibavaihi, Firouzabadi, etc.). M. Leroy caractérise de façon heureuse la linguistique de Moyen Age, dominée par les conceptions des Anciens, et celle des XVI^e—XVIII^e siècles, qui se distingue par l'intérêt pour les langues étrangères et par l'effort de trouver la parenté entre différentes langues (G. Postel, J. Chr. Adelung, J. J. Scaliger, W. Humboldt) et les lois générales régissant toutes les langues (G. Vico, *Scienza nuova*, 1725, Arnauld—Lancelot, *Grammaire générale et raisonnée*, 1660).

M. Leroy traite ensuite de la naissance de la linguistique comparée (Sasseti, Courdoux, W. Jones, Paulin de Saint Barthélémy, Fr. Schlegel) et de ses plus grands représentants (Bopp, Rask, Grimm, Pott; Schleicher, fondateur de la conception „naturaliste“ et de la typologie).

L'auteur nous familiarise avec les idées des néogrammairiens (Diez, Miklosich, Zeus, Brugmann, Delbrück, Paul, F. de Saussure, Meillet), apprécie leurs innovations fertiles et la solidité de leurs recherches, mais critique aussi leurs conceptions mécanistes et le manque d'une théorie générale sur le langage.

Il nous informe des origines de la phonétique (Rousselot, Grammont, Grégoire), de la sémantique (Paul, Bréal — mais aucune mention de Reisig), de la théorie des ondes (Schmidt), de la géographie linguistique (Gilliéron).

Il voue un chapitre tout entier à F. de Saussure et à sa théorie du langage qu'il explique avec une admirable netteté.

Plus d'une moitié du livre est consacrée à la linguistique du XX^e siècle. M. Loery nous fait connaître les principaux représentants de l'école genevoise: Ch. Bally dont l'oeuvre est remarquable par la rigueur logique ainsi que par le souci des moindres nuances, A. Sechehaye excellent dans l'analyse psychologique et H. Frei, promoteur de la linguistique fonctionnelle.

L'auteur s'occupe ensuite de l'école de Prague (Cercle linguistique de Prague) qui a enrichi la linguistique d'une branche nouvelle — la phonologie laquelle étudie les sons à la base des oppositions fonctionnelles (distinctives, pertinentes). Il cite surtout N. S. Trubetzkoy et R. Jakobson.

Il nous informe ensuite des idées d'A. Martinet et de celles de G. Guillaume. Ce dernier a tenté de créer la psychosystématique, partie nouvelle de la linguistique, réservée à l'étude des systèmes.

En ce qui concerne les structuralistes danois, M. Leroy nous présente une caractéristique réussie de la conception logique de V. Brøndal et de la glossématique de L. Hjelmslev et de H. J. Uldall.