

P.H. Matthews, Inflectional Morphology. A Theoretical Study Based on Aspects of Latin Verb Conjugation. Cambridge Studies in Linguistics 6. Cambridge U.P., 1972, pp. x - 431.

In Aspects of the Theory of Syntax, Chomsky devotes six pages (170-176) out of 190 to a consideration of some of the problems of inflectional morphology (under the chapter heading, 'Some Residual Problems' - which must rank as one of the linguistic understatements of this century!). He concludes (176) that "It seems, then, that the traditional approach [in terms of paradigms] to the description of inflectional systems can be formalised quite readily [as a type of feature notation] within the [general Aspects-type] framework that we have established. Furthermore, this appears to be the most natural way to deal with inflectional systems". Matthews, on the other hand, offers us a 400-page treatment, a theoretical study, as he calls it, based on aspects of Latin verb conjugation (Chomsky uses one example, the genitive plural of the masculine noun 'Bruder' from German) which is, he says (ix) "...effectively the first installment of a work which is planned in two simultaneous parts". That is, the work under review is the theoretical prolegomena, or perhaps paralegomena (if there is such a word; if there is not, then there ought to be) to an actual treatment of Latin verb (and perhaps some noun?) inflection. One might consider at this point a proposal once made by Fred Householder: That a grammar should come in two parts. On the right hand page one finds the rules as such, laid out in their correct order, using the most economical notation possible. On the left hand page is the commentary, stating in natural language what the rules are supposed to be doing, and why, along with any other "paralinguistic" statements one might like to make. Matthews' book falls outside these two categories, since he presents no description as such, and in fact is concerned with quite different matters (ix): "There is more to linguistics than the incessant unveiling of new or allegedly new grammatical theories. There is in particular, a need for philosophical elucidation. What makes a linguist prefer one treatment of a language to another?" Matthews' intention, therefore, is to present types of competing solutions, and to say what is involved in preferring one to the others. In setting out to do this, he covers quite a bit of ground; indeed, as he says: "Some of my friends have expressed surprise (or was it despair?) on learning that my research into morphology had reached such a length." (ix)

The work is divided into four parts: Part I, Introduction, with sections on the scope of linguistic theory and evaluating morphological theories; Part II, Models of Inflectional Morphology, with sections on Item and Arrangement (the model that Chomsky rejects), characteristic features of inflecting languages, and Item and Arrangement versus Word and Paradigm; Part III, Towards a

Generative Formulation, with sections on Word and Paradigm morphology some outstanding problems in morphophonemics, including the status of the basic representation, morphophonemics and phonotactics, and the ordering of morphophonemic rules; and finally, Part IV, Towards an Evaluation Procedure, with a section on some alternative possibilities in morpholexis, which considers the role of symbol type, generality of formulation versus length of derivation, and so forth. There is an extensive list of references of about 400 items.

Before continuing with the review proper, it might be in order to say something about what kind of problem inflectional morphology seems to me to pose. One need not be a classicist to see that the -o of Latin 'amo' is a problem, because paradigmatically and syntactically it seems to be the conflation of quite a number (five, at least, not counting conjugation type, if that shows up as a "morpheme") of different grammatical categories: 1st person; Singular Number; Present Tense; Indicative Mood; Active Voice, of a Finite Verb. Any change in any one of these categories (some carry implications for other categories, as for instance the change to Imperative Mood) results (usually) in a change of form, more regularly in verbs than in nouns, since in the latter several configurations of categories share similar or identical forms,¹ complicating the descriptive and theoretical issues even more.

Taking Matthews' treatment in more detail, let us turn to the individual sections. Part I, Introduction, is really a long, inconclusive and discursive discussion of a very large number of issues that centre on the question of evaluation procedures for grammars. Starting with Syntactic Structures (Chomsky 1957), it has long been obvious that complexity and length are often the reciprocals of each other, in the sense that enriching linguistic theory (and increasing the size and range of the class of grammars provided for) by introducing additional descriptive devices, such as transformational rules, often leads not only to more abstract, but also to shorter descriptions, that is, allows the grammar to be shortened. Simplicity of treatment is thus a two-sided issue, involving the simplicity/complexity of the linguistic theory itself, and, within a particular version of linguistic theory, the more highly valued grammar is the shorter, using the available descriptive devices without restriction. At the same time, one can limit the so-called "power" of a particular theory by introducing constraints on the application of rules, rule-schemas, or the over-all format of the grammar, as distinct from the format of the rules as such. This is the line taken by Ross, Constraints on Variables in Syntax (1967), and much later work (which I won't review or refer to here, as being way off the subject). Now considering Matthews' professed interest in morphology, specifically inflectional morphology, one might have expected (also in view of his long interest in the subject) to find some new account of the subject. Instead, one is left with a feeling that here is a thorough, discursive treatment, which would no doubt make a good set of lectures on the topic in an introductory sort of way. Important questions such as adequacy (of description)

(19-22), simplicity (22-26), appropriateness (26-29) are given treatments that amount to little more than definitions, and one is left wondering what more on these topics Matthews really has to say. For this, one must wait until Part IV, Towards an Evaluation Procedure (277-395).

Part II, Models of Inflectional Morphology, has more meat in it, and is in fact quite interesting reading. Chapter 5, Item and Arrangement Morphology: an outline formulation, is an axiomatisation of Item and Arrangement (Hockett 1954). Here again one feels that Matthews' treatment really adds nothing to our understanding of the IA approach. Very simply formulated, IA is a version of Phrase Structure (PS) grammar, and Item and Process is a version of Transformational Grammar. Thus many of the problems of IA result from the necessity for it to contain a refined and clearly formulated theory of levels. For Matthews, this takes the form of a question concerning what he calls the "allomorph relation". The model works well, Matthews says, for so-called agglutinating languages, but not so well for inflecting languages such as Latin. Matthews concludes that the IA model creates difficulties for itself, particularly in assigning order to morphemes which never appear independently (such as First Person Singular, and Passive, which he treats as the morphemes/morphophonemes m and r respectively). He concludes in Chapter 6, Characteristic Problems of Inflecting Languages, that "...it would surely be a defect of 'Item and Arrangement' that it forces one to 'arrange' items in cases where 'simultaneity' would be more appropriate". (75-6) Thus Matthews apparently comes to the same tentative conclusion as Chomsky (see above). His argument is certainly bolstered with more discussion, willingness to consider alternative formulations, etc., than is Chomsky's, but the same feeling is engendered as in the case of the discussions of simplicity and so forth in Part I, namely that it has a curiously diffuse character at times; one comes away again with the feeling that not everything that Matthews says needs saying, at least not at such great length. Still, for the student or keen undergraduate anxious to see how relatively simple and obvious relationships between and among forms can turn out to be in fact quite complicated, this discussion is potentially useful. Anyone who has ever taught a seminar in the analysis of carefully selected data (e.g. H.A. Gleason, Workbook in Descriptive Linguistics 1955) knows the multiplicity of solutions that quite innocuous-seeming data can yield, but how many of these competing solutions result from genuine alternatives, and how many are artifacts forced on us by the nature of the theories we adopt is by no means obvious.

Next, in Chapter 7, Item and Arrangement versus Word and Paradigm, Matthews compares and contrasts the two approaches, having concluded (?) at the end of Chapter 6 that "Surely it may be more appropriate ... to regard the word as a whole - and not its individual parts - as the basic 'signalling unit'." As distinct from the morph, that is, in cases where the morphemic content does not correspond

one-to-one with the morph sequences. Along the way Matthews gets to a discussion of Item and Process (127ff); rehearses arguments for and against Word and Paradigm, and finally arrives in Part III, Towards a Generative Formulation, at an attempt to set up a rule system capable of using the WP model. A short review such as this cannot hope to convey very much of the complex content of this chapter, except perhaps to say the following. Basically (and it is not always easy to discover what Matthews intends as his final, if any such, statement), the term 'word', taken to refer to an actual form (which Matthews contrasts with a sequence of phonemes, or an abstract category, a kind of variable ranging over a set of constants which are the actual forms) in an inflecting language such as Latin (and here he is of course confining himself to verb inflection) consists of a root and a set of operations. The first is referred to as the 'operand', and the second as a set of operations which the operand is to undergo. This generates all possible forms, after the rules that the operations refer to have been carried out. The operations and their relationships to each other can be expressed as a finite state diagram (171), and the rules to which the resulting operations refer can be likened to a special type of morphophonemic rule, containing a specification of its precise phonological effect or shape (the operation-component); a reference to the class of stems to which the operation applies (the operand-component), and the reference-component, i.e. the class of forms to which the output will belong. For example, the form ru:pi: would have the following representation:

RUMPO
 Pf, Pr-Ind, 1st, sg
 i.e. the first singular Perfective Present-Indicative of RUMPO.
 The operation component applies in two steps. First, the
 reference { Verb whose operand is the primary stem
 { Pf, Pr-Ind, 1st, sg
rup- receives, via the operation, the suffix -i:. Next, a
 limitation-component applies, which has the effect of limiting the
 application of the operation to the correct forms of the root, so
 as to prevent the incorrect *rupi:. This states that in the case
 of the reference { Primary stem, the limitation L applies the
 { Pf
 operation of Vowel-lengthening to the operand, Root, where L is the
 inflectional class to which RUMPO belongs. This yields the form
ru:pi:, the desired form.

Assuming that I have summarised accurately (though very briefly) this section of Matthews (section 9.3, Structure of the Morphological Rule-System, 170ff) one might now compare this to an actual WP approach (Smith 1890). This typical example of a school grammar of Latin, which makes abundant use of the WP formulation, not only contains complete paradigms (in place of the tantalising fragments that Matthews offers passim), but would perhaps represent the process in the following way: Look up rumpo in the lexicon (equivalent to selection of root) and select appropriate stem (i.e. present, perfect or past participle) - equivalent to selection of primary stem from root for Matthews, plus application of the limitation operation.

Next, check infinitive for conjugation-class of verb desired. Select table indexed as to tense, mood, voice desired. Now find intersection of person and number; where necessary (i.e. perfect passive), note gender of grammatical subject as well. This finds the form (Matthews' reference) or example of an identical/similar form, of the verb under treatment. Divide example into stem and inflection; apply inflection to stem being processed; this concludes the procedure.

What has Matthews' treatment added to this elementary look-up procedure (which is the basic operation of WP, after the features denoting the grammatical categories distinguished in the inflectional system have been assigned to some root or stem)?²

The second step in the WP model would be to take the inflectional endings themselves and break them into morphs, or components, and see how these match the grammatical categories of which they are the exponents. In a treatment such as Matthews', which he intends to be generative, one starts with the grammatical categories (i.e. the syntactic categories person, number, tense, voice and mood), and attempts to show the regularities, if any, in the way in which the inflections expound these categories. Having rejected IA and IP, although adopting process statements as most suited to a WP treatment (169), Matthews must now show in detail how the forms are derived, specifically, the inflectional element. Matthews does not actually get to such a point in the remainder of Chapter 9. What he does again (or so it seems to me, omitting details) is to provide an elaborate axiomatised version of the look-up procedure that I said might be used with an actual set of paradigms (which Matthews does not give). For example, the rule for the derivation of the inflectional -i: of ru:pi: has the form (176):

$$\left[\begin{array}{c} \text{V} \\ \text{Pf, Pr-Ind, 1st, sg} \end{array} \right] \quad \underline{-i:} \quad \underline{S^1}$$

where -i: is a label for the operation:

$$\text{Operand} \quad \longrightarrow \quad \text{operand} + \underline{-i:}$$

and S¹ indicates that the operand is the primary stem. Perhaps I have missed something here (or elsewhere), but this treatment of the inflection (where, says Matthews, -i: is to be considered as a single operation symbol - 176) is a notationally explicit version of the look-up procedure that could be used with the paradigms in Smith 1890. Otherwise, there is no new insight into the mechanism of inflection, and the linguist or, as the case may be, the classicist, who came to this point in Matthews' discussion, might be forgiven for feeling that there was something intractable about Latin (and other) inflectional systems, because the ending -i: (like the ending -o: of amo:) was the conflation of several grammatical categories, namely, First Person; Singular Number; Perfective-Present; Active Voice, Indicative Mood; Perfect Stem; he would, in other words, be perfectly

justified in feeling that a great deal of energy has been expended in making the obvious almost tediously explicit.

Matthews' concluding section, Part IV, Towards an Evaluation Procedure, continues the discussion of Part I, this time with more (and better) examples, and is even more discursive, inconclusive, and sometimes even more abstract than the preceding sections. Chapter 12 deals with formal economy, by which Matthews means length, or some similar type of parameter, such as number of symbol tokens. Chapter 13, Some Alternative Possibilities in Morpholexis, takes up the effects of various choices on the simplicity measure, such as type of symbol, numbers of constructs used, generality of derivations versus length of derivations³, and so forth (all cases are discussed at length with numerous examples of notational varieties and their effects).

Chapter 14, the penultimate and one of the two lengthiest in the book (the other is 10, Some Outstanding Problems in Morphophonemics), deals with Problems of Evaluation in morphophonemics. Short of virtually reproducing the whole of this chapter, with a commentary of equal length, it is impossible to convey very much of its contents, because of the range of topics covered. Not only that virtually every proposal considered by Matthews for determining the form of a morphophonemic representation, or of a morphophonemic rule, is hedged with conditional elements; conditional uses of 'were', 'might', 'would', etc. abound. Coupled with this is Matthews' determined effort - which he manages with surprising, not to say admirable, consistency and effectiveness - to retain his eclectic stance. The overall effect, therefore, is the one noted above, that of no stone being left unturned, examined, and then returned to the pile. What is astonishing is that all this evident industry and effort should have produced so little in the way of results - that is, a concrete description of Latin verb inflection. (See note 3.) Lightner's (1972) method of proceeding is to adopt a particular (generative phonological) model, and to accept the consequences, such as the lengthy derivations (because of their generality, the point mentioned by Matthews), and the relating of forms only distantly related semantically because of the shared underlying form (such as vint 'screw' and vintovka 'rifle'). That is, the way to evaluate a linguistic theory is to adopt it, and to see where it leads in its application to a larger body of data than illustrative examples. This is just as true now as it was when Chomsky first (was he actually the first?) stated the principle in 1957.

Several final remarks. Matthews' use of what he calls a strictly phonetic transcription (ix) is not easier, but harder to read than the familiar conventional spelling. Not even the non-classicist could be unfamiliar with the appearance of the printed Latin in nearly universal use today. The one innovation that is of course useful is the substitution of the colon for the macron to indicate length, as this plays an important role in certain stem

alternations, dealt with at length by Matthews. The other is one already mentioned: Matthews' determined eclecticism. In connection with this, Matthews takes as his starting point, as could be seen earlier in his extensive treatments of IA, IP and WP the literature on morphology, morphemics, morphophonemics, etc. of the '40's and '50's. This certainly requires considerable patience and I can now in future refer students to Matthews' book for a look at the kind of direction this work would have led in, if it had not been abandoned for different matters and methods of analysis with the advent of generative phonology (see Halle 1959). This is not to say that such a pursuit is not valuable in and of itself, but extended formulation and reformulation of already well understood notions, each time with a new type of formalism by way of axiomatisation, is bound to lead to a book of considerable length, such as Matthews', without the promised and much awaited treatment of an extended body of data.

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NOTES

1. There are here none of the typical problems of derivational morphology, where the twin spectres of holes in the pattern (e.g. no *'agress' - though I have seen it in print, nevertheless - for 'agression'), and semantic discrepancy and specialisation (e.g. 'procedure' (i.e. method of proceeding with some process) from 'procede'. Although one can say, 'He proceeded into the room.', one cannot nominalise this into *'his procedure into the room', in the sense of 'procedure' given.). Regularities that seem to appear thus recede and disappear as rapidly as they arise. (See Chomsky 1965, loc. cit.)
2. It seems to me that both the linguist and the classicist might well wonder why it is necessary to go to such great lengths to make these elementary notions more complex. Even then, one can never be sure what Matthews' final formulation is going to turn out to look like, as each proposal, and each version of it, is presented in such a qualified form ("we might say ...") that what one learns on one page is replaced with an alternative on the next.
3. It is by no means obvious that length of derivation ought to count either for or against preferring a particular solution. The real issue is: What does the linguistic theory you adopt tell you about the way you ought to relate forms? If you adopt the procedure that generality of application of

morphophonemic relationships is a given, then the length of the resulting derivations has already been justified. It would seem very curious to me if one excluded certain obvious morphophonemic relationships on the grounds that the resulting derivations look too long. That is to substitute one's own feelings as a human being for scientific commitment. If one has the courage of one's convictions (provided always of course that one can bring oneself to being committed), then it is possible to produce an actual description of the morphophonemics of the inflectional system, not only of an agglutinating language, such as Turkish, but of some inflecting language such as Latin, or even a living one, such as Russian. See Lightner 1972 for an example of how to treat both Turkish and Russian, with actual derivations, long lists of lexical items arranged by stem type (Matthews' limitation component), etc. in 459pp.

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